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Models for teaching information literacy have multiplied in the last decade in dutiful response to the digital barrage and increasing ubiquity of information. Meanwhile, models for visual literacy, despite an even greater proliferation of images in this same environment, have lagged behind. Although information literacy frameworks partially address the skillset for visual information, there are nuanced competencies critical to visual literacy that are wholly unaddressed by current conceptions of information literacy. This study pinpoints and articulates those visual literacy-specific skills by activating and analyzing the pedagogical content knowledge of experienced instructors of visual media and gauges those findings against ACRL's *Framework for Information Literacy*. Discoveries move the author to propose two major threshold concepts, articulated through the frames *Close and Critical Looking* and *Creative Vision*, which are critical and specific to visual literacy.

Headings:

Visual literacy – Study and teaching

Information literacy – Study and teaching

Media literacy – Study and teaching

Visual learning

Critical thinking

Concept learning

LOOK CLOSELY, SEE CREATIVELY: IDENTIFYING THRESHOLD CONCEPTS FOR A VISUAL LITERACY FRAMEWORK FOR HIGHER EDUCATION

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1 INTRODUCTION

> *"At a young age, sighted individuals learn to 'see' in ways that come to seem effortless and automatic. As teachers, we have a tendency to conflate this effortless seeing with visual literacy, assuming that students who possess the requisite baseline skills to 'see' can, and therefore do, carefully observe and analyze each image before them. However, the often cursory attention students pay to the task of seeing a new image or reseeing a familiar image is not sufficient to produce a detailed observation of what is there, let alone a sophisticated interpretation of what it might mean.* ***We do not expect students to master a complex written text quickly, so why do we let them get by so easily with a visual one?"***[1]

The concept of visual literacy first emerged in the 1960s, when John Debes asserted its importance as "a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment."[2] Since then, many different scholars and organizations have proffered definitions for visual literacy, with each incarnation attempting to outline a set of skills that will

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[1] Deandra Little, Peter Felten, and Chad Berry, "Liberal Education in a Visual World," *Liberal Education* 96, no. 2 (2010): 46.

[2] John Debes, "What is Visual Literacy?," Proceedings of the First National Conference on Visual Literacy, Rochester, New York, March 23-26, 1969, (1969): 27.

empower an individual to find, use, cite, and create visual information in its myriad forms.

What runs common to the various definitions of visual literacy, as I will discuss in the literature review that follows, is the fact that visual competencies are teachable and have a place in curricula. Consequently, there have been many attempts to codify the skills in an effort to make learning outcomes available and accessible for instruction and assessment. One of the most prominent sets of standards, and the one that I take as a central construct in this paper, is that of the Association of College and Research Libraries (ACRL), the *Visual Literacy Competency Standards for Higher Education*.[3] This particular set of benchmarks was written for librarians and information professionals working in undergraduate, graduate, and post-graduate academic environments. The set of visual literacy standards were something of an echo from ACRL's earlier *Information Literacy Competency Standards for Higher Education* and reflect this in their emphasis on finding, using, and evaluating information.[4] While the visual literacy standards put forth by ACRL could certainly benefit from deeper investment in their visual analysis and creative components (in addition to a conceptual- rather than outcome-driven approach), the *Visual Literacy Competency Standards* serve as the most comprehensive formulation to date of learning outcomes for visual information skills that I have encountered.

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[3] *Visual Literacy Competency Standards for Higher Education*, Association of College & Research Libraries, October 27, 2011, http://www.ala.org/acrl/standards/visualliteracy/.
[4] *Information Literacy Competency Standards for Higher Education*, American Library Association, 2000, http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/standards.pdf.

In the spring of 2015, ACRL released its heavily revised information literacy competencies through a *Framework for Information Literacy for Higher Education* utilizing analysis of threshold concepts, backward design, and metaliteracies. This revision came in response to a call among librarians and faculty for a system that better reflected the complex environments in which information is sought, used, and manipulated.

Visual literacy, too, requires this more complex articulation. Beyond sharing the need for a conceptual framework that considers the more complex "deep thinking, reflecting, constructing, innovating, and learning" processes of students, visual information in and of itself demands a more sophisticated pedagogical approach because the environments in which we search for information are verbal and the images in question are not.[5] Visual literacy then demands a more complex paradigm that reflects the richness and reach of visual information through its own "Framework," utilizing those pedagogical and cognitive theories of threshold concepts, backward design, and metaliteracies employed for information literacy. Such a framework does not yet exist.

Thus, the task of this paper, in a first step toward the establishment of more dynamic, holistic, and adaptable standards for visual literacy, will identify potential threshold concepts to be used as frames for an articulation of visual literacy competencies. While visual literacy includes the traditional library instruction content of access, discovery, and citation, it also involves concepts of analysis, evaluation, and

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[5] Kuhlthau, Carol C., "Rethinking the 2000 ACRL Standards: Some Things to Consider," *Communications in Information Literacy*, 7, no. 2 (2013): 93.

creation that are increasingly finding homes in academic and research library environments such as makerspaces, design labs, and information visualization technologies. A conceptual framework for visual literacy, then, will address this growing need for students in higher education to understand and manipulate a hugely important and complex type of information: visual media.

The paper that follows includes a literature review situating the subsequent study within scholarly conversations of information/visual literacy and threshold concepts; a second literature review on methodology to explain and contextualize the approach, format, and target participant of the survey conducted; a coded analysis of the results of said survey to illustrate emergent themes; a discussion of the resultant themes that comparatively assesses them against the ACRL's *Framework for Information Literacy for Higher Education* to illuminate overlaps, shortfalls, and areas of pedagogical importance for visual literacy that arose from comparison; and a conclusion that proffers two threshold concepts, articulated as *Close and Critical Looking* and *Critical Vision*, that meet the nuanced, crucial competencies for visual literacy specifically. This conclusion asserts the importance of these concepts not only for art and design but also for scientific images, data visualizations, and communication outlets, and calls for further research into particular lenses of information literacy (e.g. data literacy or digital literacy as well as visual literacy).

2 LITERATURE REVIEW

The following literature review attempts to situate this study's exploration of visual literacy within conversations of visual literacy, information literacy, higher education standards, and the pedagogical model of threshold concepts. The analysis and scope draws heavily on the author's knowledge in both art history and library and information science but has implications for visual media in all fields. Sections articulate disciplinary definitions to visual literacy from art history, design and media, and library and information fields; demonstrate the need for visual literacy in higher education as a means to bolster academic, career, and personal visual competencies; outline myriad standards of information and visual literacies from K-12 and higher education spheres as a way of contextualizing their pitfalls and articulating a call for new measures; and introduce the pedagogical concept of threshold concepts.

2.1 DEFINITION AND SCOPE OF VISUAL LITERACY

As stated above, John Debes was the first to formally define "visual literacy" in 1969 at a conference in Rochester, New York. Debes was collaborating with a group of librarians and researchers who would eventually become the International Visual Literacy Association (IVLA) to discuss "theories and applications of visuals."[6]

[6] Debes, 27.

Since the "group of vision-competencies" put forth in 1969, myriad definitions and scopes of the concept have attempted to articulate the needs and skill sets associated with images.[7] According to Maria Avgerinou and Rune Pettersson, consensus within the field on a single definition for visual literacy has likely been waylaid by the difficulty to "describe verbally a concept that is primarily nonverbal."[8] At the same time, there is value in exploring these variant approaches because "what the various definitions share in common is greater than what separates them."[9] Let us, then, explore a host of approaches.

2.1.1 DEFINITIONS FROM ART HISTORY

Art history has the intriguing distinction of functioning internal and external to academia. Indeed, the museum sphere has its own wealth of research into visual analytical tools, the most prominent of which comes from Philip Yenawine, who was at the helm of the Museum of Modern Art's Department of Education from 1983 to 1993, and eventually departed to work with Abigail Housen, a developmental education psychologist at Harvard. Yenawine crafted "visual thinking strategies" as a way to foster visual literacy in museumgoers, represented by learners who are able to embrace a state of visual ambiguity through open and social inquiry.[10]

Within academia, the study and pedagogy of art history has traditionally been grounded in visual competencies comparable to visual literacy. Indeed, art history survey

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[7] Debes, 27.
[8] Maria D. Avgerinou and Rune Pettersson, "Toward a Cohesive Theory of Visual Literacy," *Journal of Visual Literacy* 30, no. 2 (2011): 7.
[9] Ibid.
[10] Philip Yenawine, Visual Thinking Strategies: Using Art to Deepen Learning Across School Disciplines (Cambridge, MA: Harvard Education Press, 2013).

textbooks expound on the ideas of line, space, light, color, texture, pattern, time, motion, etc.[11] Although the texts refer to these as "elements of art," they are, in reality, elements of visual literacy.

In a theoretical approach and as an *explicit* exploration of visual literacy, art historian W.J.T. Mitchell offers a definition of visual literacy as the "rich, highly cultivated, and trained experiences and techniques of visual observation" that go beyond the "baseline" or "naturally acquired" skill of visual comprehension.[12] In "Visual Literacy or Literary Visualcy?," Mitchell cites four concepts, what I will here call competencies, of what he defines as image science:

- The **pictorial turn**, which is a recognition that philosophical outlooks at certain times in history have shifted toward a focus on the visual, as with the birth of semiotics, deconstruction, or critical iconology.

- **Image-picture distinction**, in which the observer comprehends a difference between a picture, which is a material object, and an image, which exists in memory, narrative, and representation.

[11] See Henry M. Sayre, *A World of Art* (Pearson Education, 2013), 58-175, or Marilyn Stokstad and Michael Cothren, *Art History* (Boston: Pearson Education, 2014), xxii-xli.
[12] W.J.T. Mitchell, "Visual Literacy or Literary Visualcy?" in *Visual Literacy*, ed. James Elkins, (New York: Routledge, 2008), 13-14.

- **Metapictures**, or pictures with images of other pictures nested within. Metapictures work by "structuring analogies that inform entire epistemes" and thus transcend the basic comprehension of a single picture or image.[13]

- **Biopictures**, a term he uses to reference the biological process of cloning as a referent to the theoretical and practical duplication and re-invention of the image.

Mitchell here represents some of the theoretical visual comprehensions native to the study of art history but defines them in terms of and toward the final and explicit goal of visual literacy those disciplinary boundaries.

2.1.2 DEFINITIONS FROM DESIGN AND MEDIA STUDIES

Visual literacy has also been a subject of study in the design world. In 2003, Adobe Systems of Australia commissioned a study by Anne Bamford, who crafted *The Visual Literacy White Paper*. Bamford asserts that visual literacy consists of a skill set to read, communicate, and interpret images, but further adds that "students needs to be aware of the manipulative uses and ideological implications of images."[14] She breaks down these abilities into the understanding of syntax and semantics, where syntax is the

[13] Ibid, 21.
[14] Anne Bamford, *The Visual Literacy White Paper*, Adobe Systems Inc, 2003, http://wwwimages.adobe.com/content/dam/Adobe/en/education/pdfs/visual-literacy-wp.pdf, 1.

"form or building blocks of an image" and semantics is "the way images relate more broadly to issues in the world to gain meaning."[15]

Other design-centered ideas of visual literacy focus on these more pragmatic, technical aspects of the images. Bruce Mau's *Massive Change* attempts to "chart the bewildering complexity of our increasingly interconnected (and designed) world" as advancement in scientific, economic, and politic technologies allow us to see and visualize more than ever before, creating an environment where "our insatiable embrace of the image knows no bounds."[16] In this vein, historian-designer Johanna Drucker and designer Alan Fletcher, too, assembled volumes on visual intelligence and visual poetics, discussing these skills as an acquired and evolving literacy.[17]

2.1.3 DEFINITIONS FROM LIBRARY AND INFORMATION SCIENCE

ACRL's definition of visual literacy describes the concept using highly-specific--if less theoretical--criteria for competency in students. Visual literacy, here, is a "set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media."[18] An addendum describes visually literate students as those who are "critical consumer[s] of visual media" but also, notably, "competent

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[15] Ibid., 3-4.
[16] Bruce Mau and Jennifer Leonard, *Massive Change: Institute without Boundaries*, (London and New York: Phaidon, 2004) 11, 108.
[17] Johanna Drucker, *Figuring the Word: Essays on Books, Writing, and Visual Poetics* (New York: Granary Books, 1998) and Alan Fletcher, *The Art of Looking Sideways* (London: Phaidon, 2001).
[18] *Visual Literacy Competency Standards for Higher Education*.

contributor[s] to a body of shared knowledge and culture."[19] Thus, ACRL opens up the library and information world to creative and productive endeavors in addition to the more canonical reference ideas of finding and evaluating information.

In an attempt to merge these ideas of visual literacy into a single theory for study, teaching, and application, Avgerinou and Pettersson prescribe a visual literacy composed of five concepts: visual perception, visual language, visual learning, visual thinking, and visual communication.[20] Together these ideas illustrate a visual literacy that "involves cognitive functions such as critical viewing and thinking, imaging, visualizing, inferring as well as constructing meaning; but also communicating as well as evoking feelings and attitudes."[21]

I see the most value in Avgerinou and Pettersson summation because it incorporates the traditional library-reference concepts of source discover and evaluation into a more meaningful, integrative, and multidisciplinary definition of cognition and communication. This illustrates most fully how visual literacy has import beyond art and design resource hunting but is as integral and powerful for natural and social sciences. Also important for understanding visual literacy is the resounding assertion demonstrated in these definitions that these literacies can be taught and learned.

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[19] Ibid.

[20] Avgerinou and Pettersson, 5.

[21] Maria D. Avgerinou, *Visual Literacy: Anatomy and Diagnosis*, Doctoral Dissertation, University of Bath, UK, British Library Documentation System, 2001.

2.2 VISUAL INFORMATION IN HIGHER EDUCATION

James Elkins asserts that "visual literacy, or literacies [...] are as important for college-level education as (ordinary) literacy, and far less often discussed" and goes on to posit that "reconceiving first-year college education so that it works on a visual model is, I think, the most important and potentially revolutionary problem in current curricular theory."[22] Images are not only necessary for disciplinary comprehension and success in a higher education environment, but they are also central to fostering competent and empowered readers, creators, and evaluators in the world at large, an outcome to which higher education curricula should endeavor. This section will briefly examine images for critical thinking, images in the classroom, and images in the wild to demonstrate the value of visual media for cognitive development and, consequently, to show why higher education instructors need a more powerful visual literacy framework to teach and empower their students.

2.2.1 IMAGES FOR CRITICAL THINKING

Images have the power to facilitate and reinforce critical thinking, communication dexterity, cognitive learning and retention processes, and deeper thinking. As information is exchanged across sensory channels, the reception and transmission required of students enacting these processes is what can further foster multi-literacies.[23]

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[22] James Elkins, "The Concept of Visual Literacy, and Its Limitations," in *Visual Literacy*, ed. James Elkins (New York: Routledge, 2008): 1, 3.
[23] Maria D. Avgerinou, "A Mad-Tea Party No-More: Revisiting the Visual Literacy Definition Problem," in *Turning Trees*, eds. Robert E. Griffin et al., (Loretto, PA: IVLA, 2003).

As students work to express and understand a visual language, fundamentally different from both verbal thinking and verbal expression, they are forced to navigate and become comfortable in environments of ambiguity. As ambiguity increases, so does the need for critical analysis. Students can thus build up critical thinking skills through visual literacy, and this can be carried into other academic and world endeavors.[24]

Visuals have been shown to promote critical psychological learning processes, such as increased attention, activation and accumulation of prior knowledge, mental models and imaging, motivation support, and knowledge transfer.[25] These skills are foundational for critical thinking and also offer "a different way of understanding the social world."[26]

Deeper thinking also results from visual materials' ability to "reveal what is hidden in the inner mechanisms of the ordinary and the taken for granted" to open up students' paradigms and shift them into a higher-level or disciplinary way of thinking.[27] It also offers opportunities for re-analysis of the student's schema, enabling personal learning "more deeply connected to their own lived experiences."[28]

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[24] Yenawine.
[25] Ruth C. Clark and Chopeta Lyons, Graphics for Learning: Proven Guidelines for Planning, Designing, and Evaluating Visuals in Training Materials, (San Francisco: John Wiley and Sons, Inc., 2010).
[26] Christopher J. Pole, "Seeing is Believing? Approaches to Visual Research," *Studies in Qualitative Methodology* 7 (2004): 7.
[27] Caroline Knowles and Paul Sweetman, Picturing the Social Landscape: Visual Methods and the Sociological Imagination (New York: Routledge, 2004), 7.
[28] Rourke and Rees, 11.

2.2.2 IMAGES IN THE CLASSROOM

When images are incorporated into the higher education classroom, the cognitive benefits outlined above can saturate and advance their experiences of the disciplinary content and methodologies presented there. A recent survey of the use of visual materials in teaching and coursework at Carleton College in Northfield, Minnesota, used four cross-disciplinary case studies covering video creation, group presentation, film critique, and science writing. While the former two assignments (video production and group presentation) focused more explicitly on the creation and expression of visuals and the latter two assignments (film critique and science writing) focused on visual analysis of a documentary and maps, respectively, a number of patterns emerged across all case studies.

Student surveys across the disciplines found the following barriers which could be remedied by institutional support: challenges working with a visual assignment type, problems finding visual information, difficulty working with visual tools, and mechanics of working with non-textual materials.[29] Notably, one of the recommendations for institutional curricular support was to "continue to refine understanding of 'visual literacy.'"[30]

Visual literacy is of growing import for educating students into an increasingly visual and digital information and research world. Benjamin Harris notes that "the

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[29] Andrea Lisa Nixon, Heather Tompkins, and Paula Lackie, *Curricular Uses of Visual Materials: A Mixed-Method Institutional Study*, Carleton College, Dean of the College Office, 2008, http://apps.carleton.edu/curricular/support/assets/CUVMFinal.PDF, 55.
[30] Nixon, Tompkins, and Lackie, 62.

contemporary information age is as dependent on the image as the word," and that students are finding and utilizing images in courses more than ever.[31] This vastly dynamic 21st century learning environment places visual and digital literacies above textbook literacy and calls on the educator to "embrace a more visually creative way of communicating understanding."[32]

Indeed, increasing image use in the classroom will not only reflect student realities, but it can also benefit pedagogy. David Green conducted a large-scale study of 400 faculty across 33 liberal arts institutions and found that visual materials empowered teachers with creativity, allowing them to "feel less tied to a linear textual narrative" and to carry out more interactive classes once images were incorporated into their lesson plans.[33] Neva Cramer, too, points to higher student engagement associated with utilizing the visual arts in the classroom. Further, this kind of teaching "helps students develop critical and creative thinking dispositions in preparation for meeting the demands of career and life skills necessary for success in a global society."[34] Scaffolding visual materials and visual skills into coursework will also solidify long-term learning and facilitate the acquisition of progressively more sophisticated visual (and non-visual)

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[31] Benjamin R. Harris "Image-inclusive Instruction." *College & Undergraduate Libraries* 14, no.2 (2007): 65-75. doi:10.1300/J106v14n02_05 (pg. 65-66)

[32] Arianne Jennifer Rourke and Vaughan Rees, "Models for Researching the Visual and Their Implications to Higher Education Teaching and Learning," *International Journal of Learning in Higher Education* 22, no. 3 (2015): 1.

[33] David Green, *Using Digital Images in Teaching and Learning: Perspectives from Liberal Arts Institutions,* Academic Commons, 2006. http://www.academiccommons.org/files/image-report.pdf.

[34] Neva Cramer "Transforming Learning in the 21st Century College Classroom through the Visual and Communicative Arts, *International Journal of Learning in Higher Education, 21* (2), 15.

capabilities.[35] Indeed, a high level of visual literacy "introduces [students] to disciplinary methodologies, ideologies, and interpretive practices and even prompts the kinds of interdisciplinary conversations that lead to integrative learning."[36]

2.2.3 IMAGES IN THE WILD

While visual literacy is certainly important in the college classroom, it is also a widely-applicable skill set for functioning as a citizen and professional in a highly-digital, highly-imaged world. To use W.J.T. Mitchell's pithy statement, "the problem of the twenty-first century is the problem of the image."[37] Peter Felten expanded this idea with the assertion that images "no longer exist primarily to entertain and illustrate" but now are "becoming central to communication and meaning-making."[38]

On the level of social, economic, and political action, "an increasing number of decisions in society are being made on the basis of pictorial representations."[39] In this environment, a skill set in information visualization can support strategic decision

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[35] John D. Bransford, Ann L. Brown, and Rodney R. Cocking, eds, *How People Learn: Brain, Mind, Experience and School*, Washington, DC: National Academies Press, 2000.
[36] Little, Felten, Berry, 47.
[37] W.J.T. Mitchell, *Picture Theory: Essays on Verbal and Visual Representation*, (Chicago: University of Chicago Press, 1995), 2.
[38] Peter Felton. "Visual Literacy." Change: The Magazine of Higher Education 40, no. 6 (2008): 60.
[39] L. M. Nielson, "Imagining Space on the Base of Pictorial Representation," in *Visual Literacy and Development: An African Experience*, eds. Robert E. Griffin, et al., 167-172. (Loretto, PA: IVLA, 2004), 169.

making across fields, facilitate comprehension of various system elements, and foster holistic thinking.[40]

Elkins remarks that in the last 30 years, "the rhetoric of images has become far more pervasive, so that it is now commonplace in the media to hear that we live in a visual culture, and get our information through images. It is time, I think, to take those claims seriously."[41] One serious response to this demonstrated visual environment has been the creation and implementation of curricular and pedagogical standards for information and visual literacy.

Visual literacy is not unlike any other literacy. An understanding of the language is necessary in order to maximize understanding of, participation in, and impact on the world. Just as one needs to be able to read words in order to develop sophisticated and communicable arguments in speech, one needs to able to read images in order to articulate refined and intelligible arguments in visual media. Education standards enable a foundation on which to build effective pedagogy and to inculcate students into this sphere of critical visual consciousness.

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[40] Michael Ollinger, Stephanie Hammon, Michael von Grundherr, and Joachim Funke, "Does Visualization Enhance Complex Problem Solving? The Effect of Causal Mapping on Performance in the Computer-Based Microworld Tailorshop," *Education Technology Research and Development* 63, no. 4 (2015), 621.

[41] Elkins, 4.

2.3 INFORMATION + VISUAL LITERACY STANDARDS

Many educational associations have written learning standards that expound in whole or in part on necessary competencies for visual literacy. While these standards use variant terminology and are correlated with visual literacy to varying degrees, their existence demonstrates the fundamental need for visual skills and a framework for pedagogical direction in an increasingly interconnected, digital, global, visual, and creative environment. The following sections examine information and visual literacy standards in K-12 and higher education, explore a call for greater complexity in these standards, and consider implications for visual literacy specifically.

2.3.1 VISUAL LITERACY STANDARDS FOR K-12 EDUCATION

It is productive to survey visual literacy standards for K-12 education because the breadth, depth, and context of their presentation represent the foundational understanding of visual literacy (or lack thereof) that students have experienced before entering the higher education setting. Often, this exposure is general and cursory.

The National Council of Teachers of English (NCTE) uses the terminology of "multimedia texts" and "multimodal literacies" to incorporate the visual alongside more traditional verbal literacy standards. The group's Position Statement on Multimodal Literacies proffers as its first point that "integration of multiple modes of communication and expression can enhance or transform the meaning of the work beyond illustration or

decoration."[42] The guidelines, however, address "the broadest definitions of multimodal literacies," which is too general for transcription into threshold concepts. Additionally, while the NCTE nominally includes English instructions from elementary to college levels, most of the guidelines are in reality geared toward K-12 education and thus are of less value for higher education praxis.

In 2001, the North Central Regional Educational Laboratory (NCREL), also with a K-12 focus, released their enGauge 21st Century Skills standards, which include visual literacy alongside basic, scientific, economic, technological, information, multicultural, and global literacies. The simple call for visual literacy requires that students first "have working knowledge of visuals produced or displayed through electronic media" and also "apply knowledge of visuals in electronic media."[43]

Finally, the American Association of School Libraries (AASL), which is a division of the American Library Association (ALA), also released a document for their K-12 base, called Standards for the 21st-Century Learner. AASL simply acknowledges the "more complex" definition of information literacy as a result of changing resources and technologies and recognizes visual literacy along with digital, textual, and technological literacies without further exploration of definitions or characteristics of

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[42] "Position Statement on Multimodal Literacies," *National Council of Teachers of English,* last modified 2008, http://www.ncte.org/positions/statements/multimodalliteracies.

[43] *enGauge 21st Century Skills: Literacy in the Digital Age*, North Central Regional Educational Laboratory and the Metiri Group, 2003: http://pict.sdsu.edu/engauge21st.pdf, 24.

each.[44] While productive to consider their myriad definitions, as these are the foundations on which incoming freshman have likely built their understanding of the power of images, K-12 standards are too general for productive re-inscription in threshold concept frames for higher education. We must look elsewhere for a productive example on which to build a useful framework for visual literacy.

2.3.2 INFORMATION + VISUAL LITERACY STANDARDS IN HIGHER EDUCATION

While visual literacy receives attention as a multimodal literacy or a media literacy in several K-12 contexts, its "inclusion of visual literacy in higher education standards is limited."[45] Indeed, standards for visual discovery, analysis, and creative skills "continue to be marginalized in the national discourse, particularly in liberal education."[46]

One notable exception to this phenomenon, discussed above, comes from the Association of College and Research Libraries (ACRL). The organization first came out with *Information Literacy Competency Standards for Higher Education* in 2000. That document provides an extensive list of 6 standards, 22 performance indicators, and 87

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[44] *Standards for the 21st-Century Learner*, American Association of School Librarians, 2007: http://www.ala.org/aasl/sites/ala.org.aasl/files/content/guidelinesandstandards/learningstandards/AASL_LearningStandards.pdf, 3.
[45] Denise Hattwig, Kaila Bussert, Ann Medaille, and Joanna Burgess, "Visual Literacy Standards in Higher Education: New Opportunities for Libraries and Student Learning," *portal: Libraries and the Academy* 13, no. 1 (2013), 67.
[46] Little, Felton, Berry, 44.

outcomes in an effort to provide pedagogical and assessment material for instruction librarians.[47]

It wasn't until 2011 that ACRL produced the *Visual Literacy Competency Standards for Higher Education*, which in many ways echoed and paralleled its information literacy predecessor. This document manifests in the same structure, with 7 standards, 24 performance indicators, and 100 learning outcomes. Like the information literacy standards, the document is meant to evoke actionable tasks that competent students will be able to perform and that the instruction librarian can utilize for lesson planning and assessment.[48] This list of 131 bulleted skills is fundamentally outdated in its overly-simplistic task-based demands and its lack of more a more powerful, conceptual outlook. The next two sections will address more innovative methodology potentials.

2.3.3 THE CALL FOR COMPLEXITY IN INFORMATION LITERACY STANDARDS

In 2011, the same year that ACRL published its *Visual Literacy Competency Standards*, the organization assembled a Task Force to see if and how to update its information literacy standards, at that time over a decade old. Carol Kuhlthau, among others, doubted whether the standards from 2000, on which the visual literacy standards had freshly been modeled, were able to "fully capture the role of information literacy in a person's capacity, not only for wisdom, but also for deep thinking, reflecting, constructing, innovating, and learning that are the most important purposes of

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[47] *Information Literacy Competency Standards for Higher Education*.
[48] *Visual Literacy Competency Standards for Higher Education*.

information seeking and use."[49] Kuhlthau further argued that a new approach should respond to the fluid, holistic process of students' research experiences and address their affective, cognitive, and physical needs.

Grant Wiggins and Jay McTighe point out three big issues of the content standards in general, which apply to the ACRL Standards specifically: the "overload problem," in which there is too much content to cover in too little time; the "Goldilocks problem," in which the standards are either too big or too small; and the "nebulous problem," in which the standards are too vague as to be mis- or variously-interpreted.[50] Edward Owusu-Ansah agrees with the overload issue, remarking that "the thoroughness of what the drafters of the standards produced may well have compromised the practical viability of their work."[51] The authors thus concur with Kuhlthau, recommending a shift in focus to the "big ideas" or "core tasks" of a discipline.[52]

Understandably, the ACRL Task Force agreed that the standards needed extensive revision in an effort to adapt them to "the changing global higher education and learning environment."[53] In early 2015, they issued the new *Framework for Information Literacy*

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[49] Kuhlthau, 93.
[50] Grant Wiggins and Jay McTighe, *Understanding by Design* (Upper Saddle River, NJ: Pearson Education, 2005), 60-62.
[51] Edward K. Owusu-Ansah, "Information Literacy and the Academic Library: A Critical Look at a Concept and the Controversies Surrounding It," *The Journal of Academic Librarianship* 29, no. 4 (2003): 226.
[52] Wiggins and McTighe, 62.
[53] *Framework for Information Literacy for Higher Education*, Association of College and Research Libraries, 2015, http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/infolit/Framework_ILHE.pdf, 15.

for Higher Education. In place of a list of prescriptive outcomes and indicators, the new *Framework* offers "a cluster of interconnected core concepts, with flexible options for implementation" and is informed by ideas of threshold concepts, backward design, and metaliteracy.[54] This more innovative and intentional pedagogical framework reflects greater consciousness of cognitive theory and holds promise for greater applicability—a potential relevant for visual literacy as well.

2.3.4 IMPLICATIONS FOR VISUAL LITERACY STANDARDS

While the above studies were conducted around information literacy, their findings hold for visual literacy as well. The ACRL document for visual literacy has even more standards, performance indicators, and learning outcomes than its information literacy predecessor, and thus clearly exacerbates the "overload," "Goldilocks," and "nebulous" problems outlined by Wiggins and McTighe. Owusu-Ansah's argument, too, about the downfalls of such extreme thoroughness applies to the 131-bullet-pointed list of visual literacy criteria.

Kuhlthau's argument about the need for a standard such as this to reflect wisdom, critical thought, reflection, innovation, and construction of ideas is even more essential for visual literacy because the paradigms of the concept itself require a separate way of thinking. Earlier, I noted Avgerinou and Pettersson's observation that visual literacy is so hard to define because there's an added layer of difficulty when the communicator has to use verbal description for something that is entirely nonverbal.[55]

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[54] Ibid.

[55] Avgerinou and Pettersson.

This layered difficulty is also illuminated by Allan Paivio's Dual Coding Theory, which describes cognition as separate verbal and visual systems. When verbal information, i.e. language, is received through the senses, it proceeds to the verbal processor of the brain. Visual information, i.e. objects and events, meanwhile, proceeds on a different path toward a distinct visual processor. When information has to transfer between the verbal and visual processors, data from one system must connect to and activate information from the other.[56] This endeavor thus requires processes to organize and transform information on representational, referential, and associative levels.[57]

Thus, visually literate students will not only have to think deeply, reflect, construct, and innovate ideas (as Kuhlthau notes for information literacy), but they will also have to conceptualize these ideas from something outside the verbal and translate them into words for writing and discussion (and vice-versa). The call for a framework utilizing threshold concepts, backward design, and metaliteracy is thus just as essential, if not more so, for visual literacy. It is toward the foremost of these educational theories which I now turn.

2.4 THRESHOLD CONCEPTS

2.4.1 DEFINITION OF THRESHOLD CONCEPTS

Threshold concepts are concepts or experiences which "resemble passing through a portal, from which a new perspective opens up, allowing things formerly not perceived

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[56] Mark Sadoski and Allan Paivio, *Imagery and Text: A Dual Coding Theory of Reading and Writing* (New York: Routledge, 2013): 28-29.
[57] Ibid., 47-48.

to come into view."[58] These concepts are transformative, integrative, irreversible, often troublesome, and may be bounded. Transformation brings about a shift in perspective; integration unifies previously disparate ideas; irreversibility conveys the strength and permanence of the shift; "troublesome" connotes difficulty for learners; and boundedness accounts for difference among disciplines.[59]

When "students don't passively accept and believe what they are told or what they read, but rather engage in debate, discussion, and critical questioning of the content," they are able to progress through a state of liminality and a shift of consciousness.[60] This kind of transformational learning is facilitated when instructors frame their pedagogical structure, content, and environment around the particular threshold concepts of their discipline.

2.4.2 THRESHOLD CONCEPTS IN INFORMATION LITERACY

Research and identification of threshold concepts has proliferated since Jan Meyer and Ray Land first outlined the theoretical basis of the concept in 2003. While much of this work has been done in traditional disciplines of academia (specifically, economics for Meyer and Land), applicability for studies within transdisciplinary areas, like information literacy, has also been demonstrated.

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[58] Jan H. F. Meyer, Ray Land, and Caroline Baillie, "Editors' Preface," in *Threshold Concepts and Transformational Learning*, eds. Jan H. F. Meyer et al., ix–xlii (Rotterdam, Netherlands: Sense Publishers, 2010), ix.
[59] Meyer, Land, and Baillie, ix-x.
[60] Rob Kelly and Patricia Cranton, "Transformative Learning: Q&A with Patricia Cranton," *Faculty Focus*, 2009, 1.

First, threshold concepts can help both instructor and learner focus on the bigger picture. Lori Townsend, Korey Brunetti, and Amy Hofer assert that threshold concepts provide deeper meaning for library instruction sessions by establishing the larger goal and enabling the practitioner "to progress beyond teaching students how to use the library and address some of the more complex themes of information literacy."[61] Beyond establishing ties to the big picture, threshold concepts (with their delineated "troublesome" quality) are useful in their ability to point out specific material that students will need the most assistance with, thus helping to ground day-to-day pedagogical scaffolding around student stumbling blocks.

Further, threshold concepts require librarians and information instructors to establish highly-customized assessment outcomes. Megan Oakleaf notes that the move from the explicitly stated outcomes in the *Standards* to the broader concepts in the *Framework* means that librarians may have to get creative about establishing assessment outcomes for themselves from these frames, as they shift outcomes to "the purview of librarians working in a local, campus context rather than provide them at a national, profession-wide level."[62] In order to analyze the success of student learning, instructors will be "less served by employing survey and fixed-choice test questions and best served by eliciting performance assessments" to capture the "artifacts of student learning."[63]

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[61] Townsend, Lori, Korey Brunetti, and Amy R. Hofer. "Threshold Concepts and Information Literacy." *portal: Libraries and the Academy* 11, no. 3 (2011): 856.
[62] Megan Oakleaf, "A Roadmap for Assessing Student Learning Using the New Framework for Information Literacy for Higher Education," *Journal of Academic Librarianship* 40, no. 5 (September 2014), 510.
[63] Ibid., 513.

While these methods may be harder to quantify for inter- or intra-institutional comparison, they are in fact a much stronger reflection of the actual learning process. As Land, Glynis Cousin, Johannes Meyer, and Peter Davies point out, transformational learning "cannot be tackled in an over-simplistically linear 'learning outcomes' model where sentences like 'by the end of the course the learner will be able to' undermine, and perhaps do not even explicitly recognise, the complexities of the transformation a learner undergoes."[64]

I bring in these studies of information literacy not because visual literacy is a direct descendent, but because within the library and information world, research and implementation of information literacy instruction has been most fully embraced by the professional community and thus most fully studied. Its successes, failures, and developments serve as maps and lessons not necessarily to accept outright but to consider and adapt for the study of visual literacy. The literacies are parallel enough, though, that we can assume that a similarly-built and similarly-structured framework, readjusted for a visual literacy perspective, may be a powerful way to secure the advantages of a conceptually-focused pedagogical tool like ACRL's *Framework for Information Literacy.*

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[64] Ray Land, Glynis Cousin, Johannes H. F. Meyer, and Peter Davies, "Conclusion: Implications of Threhold Concepts for Course Design and Evalutation," in *Overcoming Barriers to Student Understanding: Threshold Concepts and Troublesome Knowledge*, eds. Meyer et al., (London: Routledge, 2006), 202.

2.5 REITERATION OF RESEARCH QUESTION

What the above literature illustrates is a call for a more complex, more theoretical, but also more widely-applicable definition, understanding, and execution of visual literacy for use and valuation in higher education curricula through the elucidation of threshold concepts. Such threshold concepts, if harnessed and manifested into a framework, have the power to transport students through liminal barriers of disciplinary consciousness into the states of thinking (the threshold concepts) that experts in a field share and novices lack. Thus, in the subsequent research study, my goal was to discover and articulate potential threshold concepts for visual literacy and offer elements of a new framework appropriate for in the digital, image-ridden, interactive, and creatively-charged information environment of today and tomorrow.

3 METHODOLOGY

3.1 IDENTIFYING THRESHOLD CONCEPTS: A LITERATURE REVIEW

There are many methodologies for identifying threshold concepts within various disciplines. In the follow literature review, I will trace a few, pointing to strengths and weaknesses I considered when creating my own methodology.

Peter Davies suggested a double-approach whereby the writings of scholars in his field (economics) is analyzed against writings on a similar topic by scholars of a different discipline (sociology) to illuminate paradigms of thinking inherent to a field. The writings of field experts are further compared to student writing to elucidate a divergence in "'common-sense' thinking."[65] While powerful for its intra- and interdisciplinary approaches in verbal analysis, this methodology is of little utility to visual literacy, which is inherently cross-disciplinary and visual. Analysing writing will miss the crucial translation threshold when the expert navigates between word and image.

A single group-effort longitudinal study, conducted under shifting first authors, aimed at the generation of threshold concepts in computer science and utilized five parts

[65] Peter Davies, "Threshold Concepts: How Can We Recognise Them?," Conference paper presented at the Biennial Conference of the European Association for Research into Learning and Instruction (EARLI) Padua, (September 2003), 8.

and phased methodologies involving experts and students.[66] Jonas Boustedt et al. (1) surveyed attendees of international academic conferences for concept suggestions,[67] and (2) interviewed graduating major students for a concept in which they had been "stuck at first but then became clearer."[68] Anna Eckerdal et al. (3) re-examined those interviews for "quotes related to liminal spaces," [69] and Kate Sanders et al. (4) carried out an empirical investigation to examine a specific potential threshold;[70] and Jan Erik Mostrom et al. (5) interviewed students for their stories of transformative concepts.[71] This variety of data gathering here is powerful, because threshold concepts may manifest in many different forms, but the depth and length of this methodology were outside my limited womanpower and time for this Master's paper research.

Another methodology with a history of threshold concept identification is a Delphi study, which involves a group of experts individually and anonymously

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[66] Dermot Shinners-Kennedy and Sally Fincher, "Identifying Threshold Concepts: From Dead End to a New Direction," *Proceedings of the Ninth Annual International ACM Conference on International Computing Education Research (ICER '13)*, (New York: ACM, 2013), 9.

[67] Jonas Boustedt, Anna Eckerdal, Robert McCartney, Jan Erik Mostrom, Mark Ratcliffe, Kate Sanders, and Carol Zander, "Threshold Concepts in Computer Science: Do They Exist and Are They Useful?," *SIGCSE Bulletin*, 39, no. 1 (2007), 504-508.

[68] Boustedt et al.

[69] Anna Eckerdal, "From Limen to Lumen: Computing Students in Liminal Spaces," in *ICER '07* (New York: ACM, 2007), 123-132.

[70] Kate Sanders, Jonas Boustedt, Anna Eckerdal, Robert McCartney, Jan Erik Mostrom, Lynda Thomas, and Carol Zander, "Student Understanding of Object-Oriented Programming as Expressed in Concept Maps," in *SIBCSE '08* (New York: ACM, 2008), 332-336.

[71] Jan Erik Mostrom, Jonas Boustedt, Anna Eckerdal, Robert McCartney, Kate Sanders, Lynda Thomas, and Carol Zander, "Concrete Examples of Abstraction as Manifested in Students' Transformative Experiences," in *ICER '08* (Sydney, Australia: ACM, 2008), 125-135.

generating potential concepts in the first phase, re-evaluating their selections after seeing the full list of results from the panel as a whole in the second phase, and ranking concepts of the group again in a third stage with the added assistance of average and statistical rankings of the concepts from the group's second evaluation.[72] Ken Goldman used this technique for computer science threshold concepts,[73] and Brunetti, Hofer, Silvia Hansick, and Townsend undertake this method for information literacy.[74] While promising, again, this methodology had demands beyond my resources for this first pilot study.

In previous literature proffering information literacy threshold concepts, many of which were incorporated into the 2015 ACRL *Framework for Information Literacy*, Townsend, Brunetti, and Hofer generated concepts themselves as practitioners of information literacy utilizing "iterative and discursive" processes.[75] In a follow-up study contributing more concepts later incorporated into the *Framework*, the same group surveyed information literacy instructors on "key concepts or big ideas that your students struggle to understand" and then asked the instructors how their own approach diverges from that of their students."[76] I found this methodology to be particularly productive

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[72]Mark J. Clayton "Delphi: A Technique to Harness Expert Opinion for Critical Decision-Making Task in Education." *Education Psychology*, 17 (1997), 373-386.
[73] Ken Goldman, Paul Gross, Cinda Heeren, Geoggrey Herman, Lisa Kaczmarczyk, Michael C. Loui, and Craig Zilles, "Identifying Important and Difficult Concepts in Introductory Computing Courses Using a Delphi Process," in *SIGCSSE '08* (New York: ACM, 2008), 256-260.
[74] Korey Brunetti, Amy R. Hofer, Silvia Lin Hanick, and Lori Townsend, "Threshold Concepts & Information Literacy," http://www.ilthresholdconcepts.com/.
[75] Townsend, Brunetti, and Hofer, 860.
[76] Amy R. Hofer, Lori Townsend, and Korey Brunetti, "Troublesome Concepts and Information Literacy: Investigating Threshold Concepts for IL Instruction," *portal: Libraries and the Academy* 12, no. 4 (2012), 390.

because it actively engages (and thus avoids hindsight bias) of expert instructors, who possess the threshold concept competencies but who work regularly with students who struggle to cross those same barriers. Keeping this in mind, I sought further literature on ways to incorporate and contextualize this information in survey-like form.

Dermot Shinners-Kennedy and Sally Fincher analyzed various methodologies for creating threshold concepts and identified a number of weaknesses in common approaches.[77] They found that concepts generated by previous studies have "lacked situation in the associated conceptual space," asserting that such contextual, conceptual space is essential for getting to a concept's truly transformational properties (a key requirement of threshold concepts).[78] The authors attempted to ground their own study in conceptual space by utilizing John Flanagan's critical-incident interviews, a type of questioning in which the cause, description, outcome, and feelings of a self-identified critical incident are revealed.[79] Upon analyzing their own results, however, they found hindsight bias and emotion to have clouded and waylaid their investigation. They suggested that the identification of threshold concepts utilize Lee Shulman's idea of pedagogical content knowledge.

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[77] Shinners-Kennedy and Fincher, 11-12.
[78] Ibid., 12.
[79] John C. Flanagan, "The Critical Incident Technique," *Psychological Bulletin* 51, no. 4 (1954), 7-19.

	Big Idea A	*Big Idea B*	*Big Idea C*	*Big Idea D*	*Big Idea E*
What you intend the ***students*** to learn about this idea?					
Why is it important for students to know ***this***?					
What else ***you*** know about this idea (that you do not intend students to know yet)?					
Difficulties, or limitations, connected with teaching this idea.					
Knowledge about the students' thinking which influences your teaching of this idea.					
Other factors that influence your teaching of this idea.					
Teaching procedures (and particular reasons for using these to engage with this idea).					
Specific ways of ascertaining students' understanding or confusion around this idea (include likely range of responses).					

From: Loughran, J., A. Berry, and P. Mulhall, *Understanding and Developing Science Teachers' Pedagogical Content Knowledge*. 2006, Rotterdam: Sense Publishers.

Figure 1: Loughran's CoRe Grid

Pedagogical content knowledge, or PCK, "goes beyond knowledge of subject matter per se to the dimension of subject matter knowledge *for teaching*" which includes "the most useful forms of representation of [subject] ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations—in a word, the ways of representing and formulating the subject that make it comprehensible to others."[80] PCK

[80] Lee S. Shulman, "Knowing and Teaching: Foundations of the New Reform," *Harvard Educational Review* 57, no. 1 (1987), 6-7.

has overlap with threshold concepts in that both consider an expert's subject content from the perspective of a novice learner. Shinners-Kennedy and Fincher then point to John Loughran's content representation model, or CoRe, as a means of externalizing PCK.[81]

Loughran's CoRe (Figure 1) is a grid that works to "unpack the complexity of PCK" through a series of prompts down the left-hand column of the grid, such as "What do you intend students to learn?; Why is it important for students to know this?; What knowledge do you have about students' thinking that influences your teaching of this idea; and so on."[82]

Shinners-Kennedy and Fincher argue that PCK is "current, active and intrinsically rich" with evidence for threshold concepts because it represents practical expertise in teaching and, further, that the CoRe grid "has considerable explanatory power for threshold concept research" and enables a teacher "to articulate the substance of the difficulties associated with [student] acquisition."[83]

While the authors offer the CoRe grid as a useful tool to *evaluate* potential threshold concepts, I will use the form and ideas of pedagogical content knowledge to *generate* potential threshold concepts for visual literacy by asking practitioners about their teaching methods for the already-established visual literacy standards. Visual literacy differs from traditional studies of threshold concepts and PCK because it is

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[81] Shinners-Kennedy and Fincher, 14.
[82] John C. Loughran, Amanda Berry, and Pamela Mulhall, *Understanding and Developing Science Teachers' Pedagogical Content Knowledge*, (Rotterdam: Sense Publishers, 2012), 26-31.
[83] Shinners-Kennedy and Fincher, 15.

inherently interdisciplinary. While information literacy, too, crosses disciplinary boundaries, it has the uniting feature of being the central domain of academic reference and instruction librarians. Visual literacy, in contrast, is taught in library and information, art, art history/criticism, design, media and communication studies, information visualization, psychology, and even the hard sciences.

3.2 SURVEY DESIGN

My primary considerations in survey design were to elicit:

- authentic, situated responses
- maximal participation and minimal participant fatigue

Drawing on my research into methodologies for identifying threshold concepts, the survey for my study asked the expert instructor four of Loughran's eight CoRe questions (Figure 2). The CoRe was abbreviated in order to keep the survey short to avoid respondent fatigue and maximize participation. The four questions were selected for their most direct relation to Meyer and Land's criteria for threshold concepts as integrative, transformative, and troublesome.

VISUAL LITERACY SURVEY QUESTIONS	LEARNING SCENARIOS (BIG IDEAS)			
	1) Finding Visual Media	2) Evaluating Visual Media	3) Interpreting Visual Media	4) Creating/Using Visual Media
A) What do you intend the students to learn?				
B) Why is it important for the students to know this?				
C) What are some common difficulties students have with this task?				
D) How does your knowledge of your students' approach to this task influence your teaching methods?				

Figure 2: Survey Questions Adapted from Loughran's CoRe and ACRL Visual Literacy Competency Standards

The "Big Ideas" (from Loughran's CoRe grid in Figure 1) under consideration were taken from the ACRL's *Visual Literacy Standards*. These ideas were combined and reworked from the ACRL's original seven into four concepts, again for the sake of survey brevity. In an effort to activate grounded, contextual pedagogical content knowledge, respondents are instructed to imagine that they are teaching first-year students essential skills for the "Big Ideas:" finding, interpreting, evaluating, and creating/using visual media.

The CoRe grid generated learning scenarios in that Big Idea 1 (Finding Visual Media) and Question A (What do you intend the students to learn?) engendered a pedagogical scenario where the instructor was actively considering what s/he wanted students to learn when finding visual media.

3.3 SURVEY DISTRIBUTION

The survey was created on Qualtrics and distributed through a number of visual literacy-area listservs, including the Art Libraries Society of North America (ARLIS/NA) and Visual Resource Association (VRA) as well as various information visualization, media/communications, and design research communities.

3.4 ANALYSIS

Coding of the survey results followed the suit of Hofer, Townsend, and Brunetti's methodology for identification of information literacy threshold concepts.[84] Completed

[84] Hofer, Townsend, and Brunetti, 390-392.

surveys were read, re-read, and analyzed. As repeated ideas become apparent, free text tags (codes) were employed to describe survey response content, and codes were merged into larger themes to elucidate the clearest and strongest concepts from the data.

Special attention was paid to concepts identified by participants as integrative, transformative, troublesome, irreversible, and bounded, as those are the full five characteristics outlined by Meyer and Land as denoting threshold concepts. From these trends and reiterations, potential threshold concepts for visual literacy emerged.

3.5 GOALS OF RESEARCH

As with information literacy, the agreement and implementation of threshold concepts for visual literacy will require iterative studies involving both the generation of possible concepts through expert analysis and the testing, reinvestigation, and observation of student experience. My hope is that, by utilizing PCK, the two perspectives will be more greatly aligned and can progress more efficiently, but because this is the first (of which I'm aware) formal excursion into threshold concepts for visual literacy, my foci are the following:

- To identify areas of difficulty, or learner stumbling blocks, in visual literacy
- To generate potential threshold concepts through analysis of survey results

Here I echo Hofer, Townsend, and Brunetti from their second study on information literacy concepts: "In this case, it is not a goal to prove quantitatively that all

librarians agree about specific troublesome concepts. Rather, [I] seek to identify areas for deeper exploration and potential application of the threshold concept framework."[85]

[85] Hofer, Townsend, Brunetti, 390.

4 RESULTS

4.1 PARTICIPANTS

Participants were recruited from various library, art, design, and data visualization listservs. The survey was active for a period of four weeks beginning on February 3, 2016, and data was downloaded for analysis after 26 days. Of the 48 participants, the largest community of practice with which respondents identified was library science (26), followed by art history (12), design and studio art (6), natural sciences (5), social sciences (2), visual studies (1), media/communications (1), and other (1), with multiple identifications per respondent allowed. The author acknowledges that the majority of respondents in the library and art communities may elicit a bias in data but asserts that the conclusions hold import for natural sciences, social sciences, and media/communication as much as for art and design fields.

4.2 SURVEY QUESTIONS

Responses to the first question of each scenario (1A, 2A, 3A, 4A: What do you intend the students to learn?) provided a discrete set of skills that instructors of visual media saw as particularly important for their students to master. The second question (1B, 2B, 3B, 4B: Why is it important for the student to know this?) incited broader knowledges or more widely-applicable abilities toward which instructors oriented their teaching. The third question (1C, 2C, 3C, 4C: What are some common difficulties

students have with this task?) listed areas of difficulties, or stumbling blocks, that reveal particularities of the learning process for visual media and allude most directly to potential threshold concepts. Finally, the fourth question (1D, 2D, 3D, 4D: How does your knowledge of your students' approach to this task influence your teaching methods?) offers insight into ways instructors are working through those areas of difficulty and sheds further light on learning blocks in visual media. Responses are weighed both according to their occurrence across the four learning scenarios of searching, interpreting, evaluating, and using/creating visual media as well as the frequency of their appearance. Each question has its own codes, which are evaluated and placed into eight themes common to all four questions. These themes are analyzed against existing information literacy frames both for overlap with information literacy and specificity to visual literacy.

4.3 CODING PROCESS

Responses were coded for each question and across all learning scenarios for that question. Figures 4-7 illustrate the frequency of individuals code for each learning scenario of a single question. For example, Figure 4 addresses the coding and frequency of Question A for all learning scenarios. Through multiple iterations of coding, prevalent and pervasive themes emerged across all questions and all categories. Themes are listed alongside a definition and example in Figure 3 below. Emergent and prevalent themes will be discussed as they appear for Questions A-D in the following sections.

THEME	DEFINITION	EXAMPLE
Understanding the Context of an Image	A student's ability to grasp the placement of an image or visual medium within a larger narrative, whether that be literal, historical, or argued	The larger considerations and context of a photo in a news article on Kurdish conflicts, a sculpture in a Neoclassical-period gallery, or a graph in a peer-reviewed geophysics journal
Search Strategies	Strategic exploration and discovery abilities as they operate within visual literacy	How to use an image search interface, create a search statement or select keywords for images
Copyright/Citation	Image rights, source referencing, and ethics for responsible visual media use	How to find or cite Creative Commons images
Close/Critical Viewing	Focused visual consideration of form and content	How look deeply at the visual properties and interplay of form in a work of visual media
Communicating through Images	An ability to convey a narrative or argument through visual media	How to use or interpret an art film, an Instagram post, or an advertisement
Authority of Images	Related to copyright and citation but refers more specifically to the quality and reliability of the image	How to assess the accuracy of a graph or a photo reproduction of a painting
Critical Media Literacy	Related to context but comprises the more nuanced understanding of visual materiality and form	How to discipher the paper texture of artists' books, the resolution of a video, the manipulation of a digital photograph
Creativity	Innovative thinking, imagination, ingenuity, or vision	How to utilize new perspectives for design, articulate an idea with limited resources

Figure 3: Emergent Themes from Survey Responses

4.4 WHAT DO YOU INTEND THE STUDENTS TO LEARN?

When survey participants were asked what they intended their students to learn from visual media instruction (Question A), the most common responses were an understanding of an image or graphic's relationship to its media form (newspaper, scholarly article, etc.); a grasp of search tools and sources beyond Google Images, especially ones that offer quality, reliable images; an array of Search Strategies specifically for visual media; perceptivity to context (for both use and understanding) of

Figure 4: Coded Responses to Question A

CODES	LEARNING SCENARIOS						
QUESTION A) What skills do you intend your students to learn?	Searching	Interpreting	Evaluating	Using/Creating	Total Instances	Total Instances (in % of 48 participants)	Scenario Frequency (out of four)
Relationship of the visual to media form (newspapers, scholarly articles, etc.)	2	5	2	1	10	20.83	4
Beyond Google images, range of tools for image search, different scopes, sources	7	1	2		10	20.83	3
General image search strategies (interface skills, defining search statement, selectivity)	8		1		9	18.75	2
Understanding (or using) context		4	1	3	8	16.67	3
Knowing images you can use under copyright/how to use copyright for own images	5		1	2	8	16.67	3
Formal analysis of images		8			8	16.67	1
Critical analysis of images		7	1		8	16.67	2
How to communicate own purpose/narrative with images				7	7	14.58	1
Finding reliable/quality images	1		5		6	12.50	2
Citing images	1		4		5	10.42	2
Difference between primary and secondary sources	1	1	1	1	4	8.33	4
Value of browsing	1				3	6.25	1
How perspective influences meaning		2		1	3	6.25	2
How Google images works	1		2		3	6.25	2
Sizing/manipulation	1		1		2	4.17	2
Difference between searching for text and searching for images	2				2	4.17	1
Conjuring questions/topics from an image		2			2	4.17	1
Creativity				1	1	2.08	1
Finding relevant images	1				1	2.08	1
					Shading indicates top 50% of most-frequently occurring codes		Shading indicates codes that appeared in at least three learning scenarios

visual media's context; formal and critical analysis; an ability to communicate a message through images; and a working knowledge of copyright and citation for visual media (Figure 4). Of these, the relationship of the visual to media form, search tools, context, and copyright were mentioned in at least three of the four scenarios, meaning that they were skill sets important to the majority of the contexts in which students learned how to search, interpret, evaluate, and use/create visual media.

When folded into broader themes, Search Strategies, Understanding the Context of an Image, and Close/Critical Viewing emerged as the most pervasive categories across all coded responses in Question A. These were followed by Copyright/Citation, Communicating Through Images, Authority of Images, Critical Media Literacy, and Creativity, respectively.

4.5 WHY IS IT IMPORTANT FOR THE STUDENT TO KNOW THIS?

When survey participants were asked why it was important for their students to know these skills (Question B), the most common responses were to enable students to evaluate image and media contexts, to attain career and academic success, to become informed visual consumers, to effectively connect visual media to arguments, to use and produce images ethically through copyright and citation, to produce their own visual media creatively and flexibly, to detect biases of a visual medium, and to think broadly about the world (Figure 5). Of these, evaluating image/media context, career/academic success, informed visual consumption, copyright/legal issues, and creativity were mentioned in at least three types of learning scenarios where students search for, interpret, evaluate, and use/create visual media.

Figure 5: Coded Responses for Question B

CODES	LEARNING SCENARIOS						
QUESTION B) Why is it important for the student to know this?	Searching	Interpreting	Evaluating	Using/Creating	Total Instances	Total Instances (in % of 48 participants)	Scenario Frequency (out of four)
Evaluating images and media and their contexts	2	5	4		11	22.92	3
Important for career success	3	2	2	2	9	18.75	4
Important for academic success	1	2	4	1	8	16.67	4
Informed consumption/reading		6	1	1	8	16.67	3
Use images to support/connect to argument	3			4	7	14.58	2
Copyright/legal issues	2		2	3	7	14.58	3
Creativity and flexibility, production	1	3	1	1	6	12.50	4
Understand bias		2	3		5	10.42	2
Think broadly/beyond what we know		4	1		5	10.42	2
How to effectively convey info in image form	3	1			4	8.33	2
Harvest/gain reliable results	2		2		4	8.33	2
Quicker/more efficient searching	2				2	4.17	1
High-quality images	1		1		2	4.17	2
Connect with/appreciate art		2			2	4.17	1
Efficiency/saving time			1		1	2.08	1
					Shading indicates top 50% of most-frequently occurring codes		Shading indicates codes that appeared in at least three learning scenarios

When these codes were enveloped into broader themes, Close/Critical Viewing emerged as the most prevalent competency, followed jointly by Understanding the Context of an Image and Communicating Through Images. A few codes (career/academic success and efficiency/saving time) did not fall into a broadly articulated theme and so were left out of the final categories.

4.6 WHAT ARE SOME COMMON DIFFICULTIES STUDENTS HAVE WITH THIS TASK?

When survey participants were asked what difficulties students commonly encountered with visual literacy tasks (Question C), the most frequent responses indicated that students were not committing enough time/energy/focus to the exercise (46%) or that they lacked the visual analysis skills to competently complete the task (35%) (Figure 6). Other top responses noted an inability/unwillingness to use sophisticated searching tools and strategies, a lack of practical technical skills to effectively create/use visual media, fear of being wrong or lack of confidence, ignorance/indifference to citation/rights policies, inattentiveness to the manipulation of image or context, and inexperience with creative tasks. Of these, lack of time/energy commitment (or "laziness") and lack of visual analytical skills were cited in three of the scenarios.

When the coded responses of these high-difficulty, or "troublesome," areas were enfolded into themes, again, Close/Critical Viewing and Communicating Through Images emerged as the most pervasive categorizations, followed by Understanding the Context of an Image, Search Strategies, and Authority of Images.

CODES	LEARNING SCENARIOS						
QUESTION C) What are some common difficulties students have with this task?	Searching	Interpreting	Evaluating	Using/Creating	Total Instances	Total Instances (in % of 48 participants)	Scenario Frequency (out of four)
Don't spend time/energy; lack depth; "lazy"	4	10	7	1	22	45.83	4
Lacking visual analysis skills, questions they need to ask, how images communicate	3	9	5		17	35.42	3
Unwilling/unable to find/use databases/tools beyond Google Images	6		4		10	20.83	2
Lack of tech skills/practice				8	8	16.67	1
Search strategies (keywords, phrases, terms)	5				5	10.42	1
Citation/rights: don't know or don't care about them	1		3		4	8.33	2
Fear of being wrong/lack of confidence		2		2	4	8.33	2
Considering manipulation of images		1	2		3	6.25	2
Unflexed creative muscles				3	3	6.25	1
Quality of images	2				2	4.17	1
Not understanding how to maximize use/narrative/evidence of/through images	1	1			2	4.17	2
Finding/using image for specific need/argument	2				2	4.17	1
Considering various audiences		2			2	4.17	1
Uncritical attitude: thinking all interpretations are fine and "there are no wrong answers"		1	1		2	4.17	2
Lack of self-awareness		1	1		2	4.17	2
Recognizing authenticity			1		1	2.08	1
					Shading indicates top 50% of most-frequently occurring codes		Shading indicates codes that appeared in at least three learning scenarios

Figure 6: Coded Responses for Question C

While there is a ranked order to these results, it is worth noting that Question C had the most closely distributed rankings of themes. Additionally, there were many codes (including the highest-frequency response) that did not fall into explicit themes: lack of depth/time commitment, lack of technical skill, fear of being wrong/lack of confidence, uncritical attitude, and lack of self-awareness. Some of these codes proved too general to categorize into themes but remain important and will be discussed in the following chapter.

4.7 HOW DOES YOUR KNOWLEDGE OF YOUR STUDENTS' APPROACH TO THIS TASK INFLUENCE YOUR TEACHING METHODS?

When survey participants were asked how their knowledge of students' approach to tasks influences their teaching methods (Question D), the most frequent responses were that instructors made an effort to convey the importance of close evaluation, work with/from Google (a familiar interface), provide myriad examples, foster a friendly relationship to risk, teach formal analysis, connect the form of the visual media to its context, compare different kinds of visual media, foster empathy for the image creators, and emphasize practice (Figure 7). Of these, the need for examples and a friendly relationship to risk were noted across three of the scenarios.

When teaching responses were coded into themes, Close/Critical Viewing, Understanding the Context of an Image, and Search Strategies proved to be the most pervasive.

CODES	LEARNING SCENARIOS						
QUESTION D) How does your knowledge of your students' approach to this task influence your teaching methods?	Searching	Interpreting	Evaluating	Using/Creating	Total Instances	Total Instances (in % of 48 participants)	Scenario Frequency (out of four)
Convey importance of close evaluation			7	1	8	16.67	2
Work with/from Google	6				6	12.50	1
Examples, examples, examples	1	2		2	5	10.42	3
Friendly relationship to error/risk		1	2	2	5	10.42	3
Formal analysis		4			4	8.33	1
Connecting form to context		3	1		4	8.33	2
Connecting/comparing different kinds of images/data	3				3	6.25	1
Empathy for copyright/creators	3				3	6.25	1
Practice, practice, practice				3	3	6.25	1
Explain how different info comes from different places	1		1		2	4.17	2
Show how to extrapolate contextual info/metadata from a visual images	1		1		2	4.17	2
Relate to students' interest	2				2	4.17	1
Consider audience		2			2	4.17	1
Have students create visual media		1		1	2	4.17	2
Encourage questions		1		1	2	4.17	2
Show high-yield searches (to make comparable to Google)	1				1	2.08	1
Show ease of non-Google	1				1	2.08	1
Comparative analysis		1			1	2.08	1
Provide questions/rubrics			1		1	2.08	1
					Shading indicates top 50% of most-frequently occurring codes		Shading indicates codes that appeared in at least three learning scenarios

Figure 7: Coded Responses for Question D

Because Question D solicited responses on methodology, however, many of the codes did not align with specific themes but remain important for the overall discussion of results. Such codes included close evaluation, examples, friendly environment to risk, empathy for creators, practice, relating to students' interests, encouraging questions, and providing rubrics for analysis.

4.8 OVERALL THEME DISTRIBUTION

When responses are summed and weighted across all four questions, the most prevalent themes that emerge are Close/Critical Viewing (16 scaled points), Search Strategies (15), and Understanding the Context of an Image (14) (Figure 8). These are followed by Communicating Through Images, Authority of Images, Critical Media Literacy, creativity/vision, and Copyright/Citation, respectively.

OVERALL THEME DISTRIBUTION (IN WEIGHTED POINTS)			
Close/Critical Viewing	16	Authority of Images	7
Search Strategies	15	Critical Media Literacy	6
Understanding Context of Image	14	Creativity/Vision	5
Communicating through Images	10	Copyright/ Citation	5

Figure 8: Weighted Theme Rankings Across All Questions and Learning Scenarios

This suggests that Close/Critical Viewing, Search Strategies, and Understanding Context of an Image are ideas that receive the most extensive and focused treatment in these visual media classrooms. These themes thus present themselves as contenders for threshold concepts, as expert instructors proved most likely to prioritize, recognize the difficulty of, and articulate these topics in the PCK-driven learning scenarios.

5 DISCUSSION

5.1 MAPPING TO INFORMATION LITERACY

Many of the themes that emerged from iterations of coding have overlap with the ACRL's Framework for Information Literacy for Higher Education. This overlap provides some entry points for teaching visual literacy through the Information Literacy Framework, but they miss the nuances essential for a comprehensive visual media-specific understanding of information use, production, and dissemination. See following table (Figure 9) for overlap areas.

This mapping is productive in that it clues us into the areas of convergence for information and visual literacy. The emergent visual literacy themes of Search Strategies, Copyright/Citation, and Authority of Images have particularly strong overlap with ACRL's information literacy frames. Understanding the Context of an Image, Communicating through Images, and Critical Media Literacy also have some significant

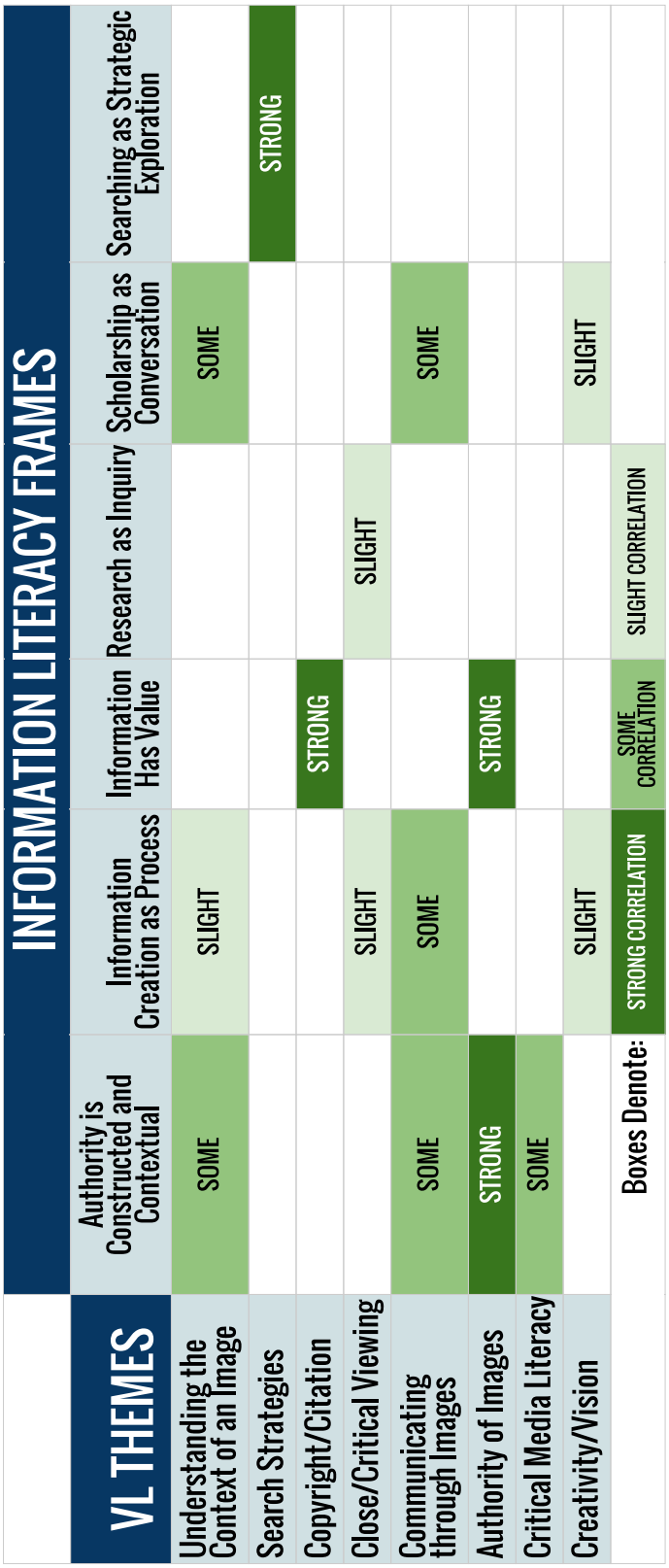

Figure 9: Mapping Themes onto ACRL Frames

To select candidates for visual literacy concepts from our PCK-driven learning scenarios, it is most helpful to consider the most prevalent themes that emerged from coding the skill-based Question A (What do you intend for the students to learn?) and Question B (Why is it important for the student to know this?) in concert with the data on student stumbling blocks contained within Question C (What are some common difficulties students have with this task?) and the resultant pedagogical methodologies that reflect on and confirm these difficulties in Question D (How does your knowledge of your students' approach to this task influence your teaching methods?).

As stated above, the three themes that emerged as the most pervasive across learning scenarios and responses were Close/Critical Viewing, Search Strategies, and Understanding the Context of an Image. It is informative, then, to consider these against the tasks that students were described as finding most difficult, as these "troublesome" concepts are the one that bring about "transformative" and "integrative" transitions.

5.1.1 CLOSE/CRITICAL VIEWING

Close/Critical Viewing tangentially touches on the information literacy frame *Scholarship as Conversation* because the standards or disciplinary structures in which a work of visual media is created is essential for in-depth consideration of a visual object. *Research as Inquiry* is also relevant as it nods to the iterative approach of Close/Critical Viewing, where the viewer must ask "increasingly complex or new questions whose answers in turn develop additional questions or lines of inquiry in any field."[86] Both of

[86] *Framework for Information Literacy for Higher Education*.

these frames, however, miss the essential undergirding of Close/Critical Viewing, which is formal—i.e., visual—engagement. Visual literacy at one of its most basic and least-mastered tenants requires the focused, time-intensive reading of visual forms, which is not addressed in any information literacy frame.

Close/Critical Viewing is acutely reflected in the two most frequently articulated areas of difficulty found in Question C, namely students' aversion to spending protracted time on a visual media task and their lack of visual analysis skills. Close/critical viewing requires not only a time and energy investment with visual media to allow for deep, reflective, and critical analysis, but also a competent practical knowledge of formal analysis itself. Without an understanding of the connections between form (which must be found and analyzed closely) and content, students will likely feel incompetent, unsure, or wary. Thus, coded difficulties that didn't emerge as inherently tied to one specific theme have important implications for Close/Critical Viewing. For example, fear of being wrong and lack of confidence can be aggravated/caused by uncritical or quick viewing that leaves a student with minimal material to work with and a lot of guesswork or fluff. Additionally, an uncritical attitude, in which a student may think all interpretations are equally correct, is borne by a student who hasn't executed the Close/Critical Viewing necessary to properly evaluate a work of visual media.

While the codes of teaching methods that emerged from Question D reveal potential methodologies for overcoming these threshold difficulties, they also reiterate the presence and importance of these difficulties. Many of the codes here, most obviously the importance of close evaluation, but also the call for examples, a friendly relationship

to error, formal analysis, connecting form to context, continual practice, and rubrics for viewing, engage the same central idea of repeated and focused *looking*.

5.1.2 SEARCH STRATEGIES

As discussed previously, the category of Search Strategies has strong overlap with the information literacy frame *Searching as Strategic Exploration*. The presence of codes for image search strategies and tools, value of browsing, how Google Images works, and finding relevant images operate within the information literacy idea that "searching for information is often nonlinear and iterative, requiring the evaluation of a range of information sources." [87]

Some codes, however, allude to a skill more specific to visual image search and visual literacy. Understanding the difference between searching for text and searching for images and the ability to conjure questions or verbal themes from an image were lesser mentioned but highly essential skills for successful image searching and comprehension. The IL frame *Searching as Strategic Exploration* again touches on this, with its affirmation that students should have "the mental flexibility to pursue alternate avenues as new understanding develops."[88] However, the general statement of mental flexibility doesn't quite reach the nuanced idea that when searching for images, the visually-literate individual must be capable of navigating between visual and verbal languages. This is a hugely difficult task and an area where lack of time/energy commitment and fear of being wrong (results from Question C) again rear their heads as signifiers of a serious and

[87] *Framework for Information Literacy for Higher Education*.
[88] Ibid.

meaningful concept. What's required here is not only experience discussing and analyzing visual materials (i.e. close/critical looking) but also the creative, visionary capacity to "see" directions of inquiry. This is a kind of insight that must be built over time through practice, examples, and critical examination.

5.1.3 UNDERSTANDING THE CONTEXT OF AN IMAGE

Understanding the Context of an Image draws on ideas articulated in the IL frames *Authority is Constructed and Contextual* in that visual media need to be "evaluated based on the information need and the context in which the information will be used;" *Information Creation as Process* in that visual media "is produced to convey a message and is shared via a selected delivery method" and that students need to be able to infer information from the creation process and package of the visual media; and *Scholarship as Conversation* in that students need to consider the "sustained discourse with new insights and discoveries occurring over time as a result of varied perspectives and interpretations" that influenced the work.

These overlaps assert the relevance of information literacy frames to visual literacy, but again the points of difficulty from Question C (and the resulting teaching methodologies on which visual media instructors rely from Question D) illuminate IL's insufficiency for visual media analysis. Specifically, students' difficulty tying images to arguments, their fear of being wrong, their inexperience with visual/formal analysis, and their uncritical attitude (the belief that all interpretations of visual media are correct) point to a significant absence of critical visual understanding. Instructors conveyed that their pedagogical content knowledge guides them to use extensive practice and examples,

develop a friendly relationship to error, encourage questions, and utilize pre-written rubrics for guided analysis, which could engender students' ability to navigate between the visual language of the image and verbal language of an argument. Further, visual media instructors emphasize in their teaching methodologies the connection of form to context, the scope and sources of visual media (i.e., that different information comes from different places), the skill of extrapolating metadata or contextual information from visual media, and a consideration of the audience of an image. Again these pedagogies operate to facilitate close and critical looking as well as the creative, visionary insight to see and articulate paths of inquiry and translations of visual form to verbal argument.

While the convergence between information and visual literacy is strong in some areas, the divergence is pervasive enough to demand attention and critical consideration for additional threshold concepts specific to these needs of close and critical looking and creative, visionary insight.

6 CONCLUSION

6.1 THRESHOLD CONCEPT CANDIDATES FOR VISUAL LITERACY

The results and analysis of this study reveal that visual literacy is closely tied to information literacy and further that information literacy frames can serve as metaphors or starting points for addressing visual literacy concepts. However, survey analysis also reveals that there are essential, troublesome concepts that the information literacy frames only tangentially address. Thus, I propose two threshold concepts for the field of visual literacy: *Close and Critical Looking* and *Creative Vision*, which operate in conjunction with IL frames. These concepts are proffered in the form of a frame statement, list of knowledge practices, and list of dispositions to parallel the format of ACRL's Framework of Information Literacy. It is worth reiterating that visual literacy is inherently interdisciplinary and that these concepts are as integral to and powerful for scientific images, data visualizations, and communication outlets as they are to the fine or commercial arts.

6.1.1 CLOSE AND CRITICAL LOOKING

The frame *Close and Critical Looking* addresses the transformative and integrative competencies of spending focused time and energy reading visual media, thinking

deeply, and developing a critical attitude (i.e. being attentive to multiple and divergent perspectives but also realizing that some can be more fully supported by the form and context than others)—topics deemed difficult or "troublesome" by this study.

STATEMENT: Looking requires the focused and iterative study, discussion, and scrutiny of visual elements and context to develop, examine, and reformulate questions and lines of inquiry.

KNOWLEDGE PRACTICES:

Learners who are developing their visual literacy abilities

- Exercise time and energy to look closely at the images, formal relations, and visual properties of visual information;
- Formulate questions for research based on formal points of interest, disjuncture, or absence;
- Question the formal structure and content in concert with the historical and ideological undergirding of a work of visual media;
- Closely reexamine the composition and formal characteristics of a work of visual media iteratively throughout the research process;
- Organize and articulate an argument or thesis around the visual and contextual information in a meaningful way.

DISPOSITIONS:

Learners who are developing their visual literacy abilities

- Consider research as an open-ended exploration and engagement with visual form and content;
- Value insight, curiosity, and multiple perspectives in developing questions and methodologies;
- Cultivate an open and critical eye;

- Appreciate that continued and comparative looking may yield new insights;
- Maintain a friendly relationship to experiment and error.

6.1.2 CREATIVE VISION

The frame *Creative Vision* addresses the transformative and integrative competencies of developing visual analysis skills, cultivating a friendly relationship to error, connecting form to context, considering audience, searching and keyword creation for images, and articulating or communicating (in words) the message of the image (visual)—again, concepts deemed difficult or "troublesome" by this study.

STATEMENT: Translating ideas and narratives between visual and verbal languages necessitates creative insight, extensive practice, and mental dexterity with a close attention to form, content, purpose, and audience.

KNOWLEDGE PRACTICES:

Learners who are developing their visual literacy abilities

- Practice close and critical looking;
- Distinguish between form (the visual properties of colors, lines, and shading) and content (the figure, image, or scene depicted) of visual media;
- Formulate multiple and iterative translations of visual (form and content) to verbal (words);
- Consider audience and intent of the work of visual media before articulating keywords, arguments, or narratives in verbal form, and vice versa;
- Develop a critical attitude toward standard methods for articulating visual and verbal media forms;
- Seek out and engage new and diverse perspectives.

DISPOSITIONS:

Learners who are developing their visual literacy abilities

- Maintain a friendly relationship to experiment and error;
- Seek opportunities for comparative and continual practices of visual and verbal articulation;
- Recognize that what makes a translation "good" is constructed and contextual;
- Suspend judgment on the value of visual media until the larger context for communication and reception is better understood;
- Appreciate the skill, time, and effort needed to translate between visual and verbal;
- Value multiple and diverse perspectives.

6.2 LITERACY LENSES

One unexpected trend from the survey was that, as the learning scenarios forayed into *evaluating* visual media and *creating/using* visual media, a number of respondents who identified as library instructors operating both internal and external to the art/design community voiced concerns or protests that this kind of learning is not meant for the library. They believed that students are expected to learn evaluation and design skills in their subject curricula and that "librarians lose credibility when they try to outperform the professor" or that "this is more a faculty/content issue." Other responses note that "as a librarian, I do not [teach] this;" these topics are only covered "in a limited capacity;" or "unfortunately, I don't get this deep into teaching this subject."

Visual literacy is not as widespread in the library and non-art worlds as information literacy, which has assumed high prominence and reputability over the last

decade. Additionally, there are disciplines that take visual analysis as a large part of their methodology; art history and design being two of these major fields. Thus, I can empathize with these respondents' hesitance to teach/adopt these aspects of visual literacy, but I simultaneously want to underline that visual literacy *is* fundamentally within the sphere of library and information instruction and that information professionals have a responsibility to empower students to find, evaluate, interpret, and create/use the visual media in which their worlds are so thoroughly infused. Students need to be able to do this efficiently, ethically, and creatively across myriad forms of visual media, and while the art- and design-centered curricula may explicitly focus on interpretation and creation of visual media, the skills are essential for students, learners, and practitioners of every field.

As information professionals, our power and importance doesn't come from our unique disciplinary content. Information science as a field, like journalism or education, is cross-disciplinary. There are aspects of information literacy taught in part, at least, in every major on every campus. Our purpose, our clout, and our fortitude, then, lies in our expertise and research in how information operates, how people interact with it, and how to facilitate competence, efficiency, and ethics in evolving and increasingly-complex information environments.

As the analysis in this study shows, information literacy and visual literacy are not at odds. Visual literacy maps fairly well onto information literacy, and information literacy can be productively utilized as a metaphor or starting point for visual literacy competencies, but there are essential concepts (like *Close and Critical Looking* and

Creative Vision) that are not effectively addressed in the information literacy frames put forth by ACRL. At the same time, *Close and Critical Looking* and *Creative Vision*, just two concepts, don't cover the full spectrum of visual media competencies. When these proposed visual literacy concepts are added to the information literacy frameworks, however, a metaliteracy framework is created that productively addresses the panoply of visual media needs revealed in this study.

Thus, I propose that there may be a series of lenses for specific areas of information literacy (e.g., a lens for visual literacy, a lens for digital literacy, a lens for data literacy) that work in concert with the basic framework of information literacy put forth by ACRL in 2015.[89] I have found in this study that there is no need to rewrite an entire framework for visual literacy; many of the fundamental concepts of visual literacy are sufficiently addressed in the six frames proffered for information literacy. However, for the specific concepts that are both essential and unique to each specific literacy (visual, digital, data), there may be additional threshold concepts which need to be addressed through supplementary frames. For visual literacy, these are *Close and Critical Looking* and *Creative Vision*.

In closing, I would like to make a call for further research into specialized literacy lenses and supplementary frames for areas such as digital literacy and data literacy, akin to the efforts put forth in this preliminary study for visual literacy. The language of the information world is not simply verbal. It's visual. It's data-intensive. It's digital. Our

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[89] Idea of multiple literacy lenses developed in conjunction with Jonathan McMichael in April 2016.

information curricula, structures, and networks need to be built with these literacies in mind to empower competent and responsible learners, creators, and readers of information. Thus, we have a responsibility to study and incorporate multiple literacies—visual literacy among them—into our pedagogical approaches and ideological understandings of the vast and complex world of information.

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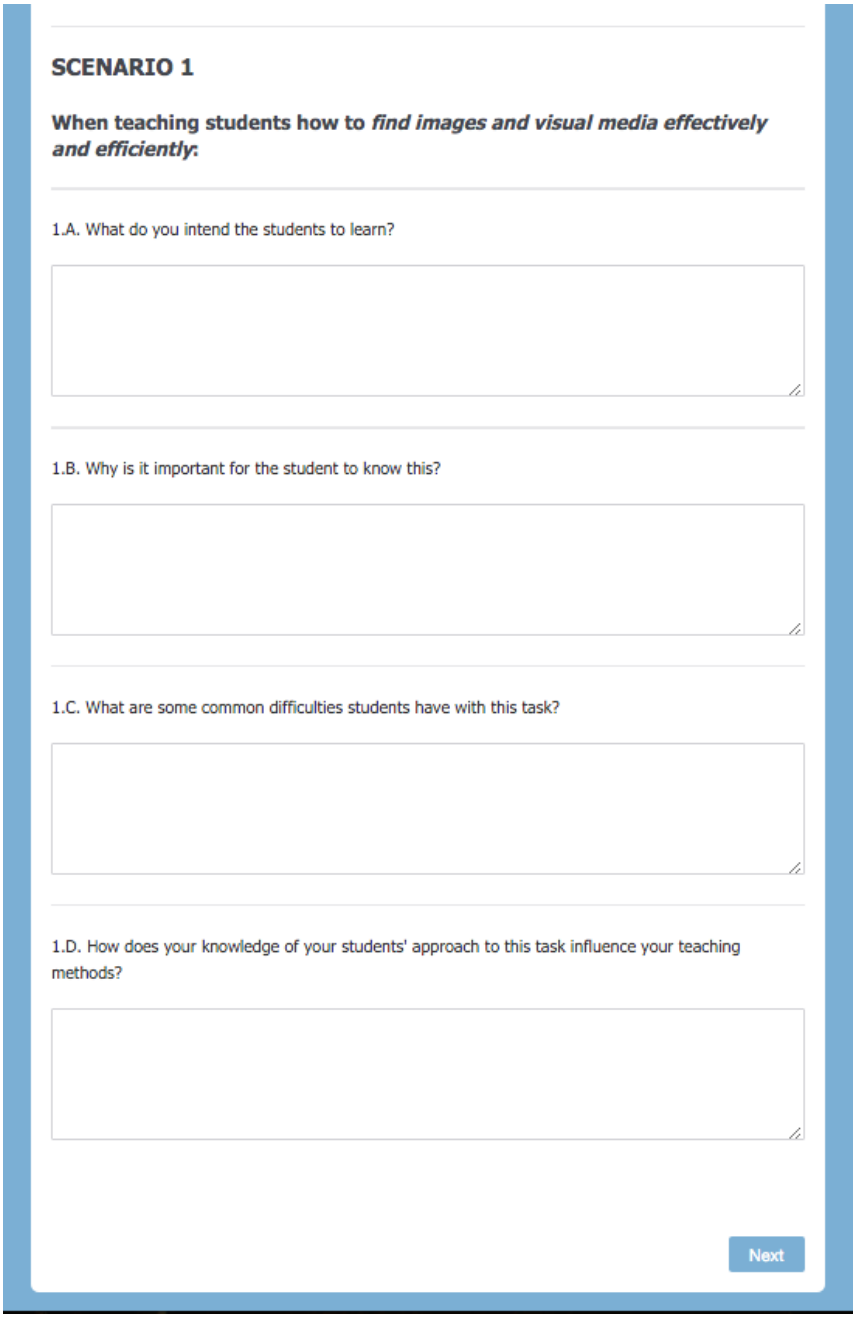
8 APPENDIX: SURVEY QUESTIONS + FORMAT



SCENARIO 1

When teaching students how to *find images and visual media effectively and efficiently*:

1.A. What do you intend the students to learn?

1.B. Why is it important for the student to know this?

1.C. What are some common difficulties students have with this task?

1.D. How does your knowledge of your students' approach to this task influence your teaching methods?

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SCENARIO 2

When teaching students how to *interpret images and visual media*:

2.A. What do you intend the students to learn?

2.B. Why is it important for the student to know this?

2.C. What are some common difficulties students have with this task?

2.D. How does your knowledge of your students' approach to this task influence your teaching methods?

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SCENARIO 3

When teaching students how to *evaluate the sources of images and visual media*:

3.A. What do you intend the students to learn?

3.B. Why is it important for the student to know this?

3.C. What are some common difficulties students have with this task?

3.D. How does your knowledge of your students' approach to this task influence your teaching methods?

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SCENARIO 4

When teaching students how to *create, design, and/or use images and visual media*:

4.A. What do you intend the students to learn?

4.B. Why is it important for the student to know this?

4.C. What are some common difficulties students have with this task?

4.D. How does your knowledge of your students' approach to this task influence your teaching methods?

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