Visual Literacy Standards in Higher Education: New Opportunities for Libraries and Student Learning

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abstract: Visual literacy is essential for 21st century learners. Across the higher education curriculum, students are being asked to use and produce images and visual media in their academic work, and they must be prepared to do so. The Association of College and Research Libraries has published the *Visual Literacy Competency Standards for Higher Education*, which, for the first time, outline specific visual literacy learning outcomes. These *Standards* present new opportunities for libraries to expand their role in student learning through standards-based teaching and assessment, and to contribute to campus-wide collaborative efforts to develop students' skills and critical thinking with regard to visual materials.

Introduction

Today's college students live in a visually rich, screen-based world. They regularly encounter and create meaning and knowledge through images and visual media. Yet this participation in a highly visual culture does not in itself prepare them to engage critically and effectively with images and media in an academic environment. Across disciplines, students are being asked to produce projects and intellectual work using visual media, and they must develop the skills needed to find, interpret, evaluate, use, and produce visual materials in a scholarly context. Visual literacy competencies are essential for 21st century learners and must be supported across the higher education curriculum.

The Association of College and Research Libraries (ACRL) has published the *Visual Literacy Competency Standards for Higher Education* (henceforth referred to as the *Visual Literacy Standards*) in response to this need for student visual literacy skill development. According to ACRL:

> Visual literacy is a set of abilities that enables an individual to effectively find, interpret, evaluate, use, and create images and visual media. Visual literacy skills equip a learner to understand and analyze the contextual, cultural, ethical, aesthetic, intellectual, and technical components involved in the production and use of visual materials. A visually literate individual is both a critical consumer of visual media and a competent contributor to a body of shared knowledge and culture.[1]

The *Visual Literacy Standards* are the first of their kind to describe interdisciplinary visual literacy performance indicators and learning outcomes. These learning outcomes provide a framework for student visual literacy learning and offer guidance for librarians, faculty, and other academic professionals in teaching and assessing visual literacy.

The *Visual Literacy Standards* approach visual literacy from an information literacy perspective but also address the unique characteristics of visual materials. The *Visual Literacy Standards* are informed by the ACRL *Information Literacy Competency Standards for Higher Education* (henceforth referred to as the *Information Literacy Standards*) and are intended to complement them. Libraries will find an approach in the *Visual Literacy Standards* that is familiar in its information literacy foundations while new in the opportunities it presents for broader areas of instruction and for partnerships with other campus instructional units. Finding images, evaluating sources, and using images ethically are all skills aligned with traditional information literacy goals. Interpreting, analyzing, and producing visual content are skills that librarians may be less accustomed to teaching, but they fit well with libraries' expanding role in supporting a broad spectrum of student literacies.

The *Visual Literacy Standards* were developed by the Visual Literacy Task Force, which was appointed by the ACRL Image Resources Interest Group. The *Visual Literacy Standards* were reviewed by an Advisory Group and individuals from more than fifty institutions. In this article, the Visual Literacy Task Force members review the recent literature on visual literacy, student use of visual materials, and contemporary learning standards. The authors discuss student learning needs related to images and visual media, and describe how the learning outcomes in the *Visual Literacy Standards* address these needs. The authors explore the role of libraries in supporting student visual literacy and assert that the *Visual Literacy Standards* provide new opportunities for libraries as campus partners in student learning.

Literature Review

Scope and Definition of Visual Literacy

Visual literacy has been an area of study and investigation since the 1960s, when John Debes and others founded the International Visual Literacy Association.[2] Since that time, visual literacy has been examined within the context of many disciplines and has evolved into a multifaceted, interdisciplinary concept. Its scope and definition are

dynamic and have often been crafted to best fit particular contexts. Variations in the definition of visual literacy are quite extensive and these definitions themselves have been the subject of research and analysis.[3]

Early definitions of visual literacy emphasized image interpretation and the skills involved in deriving meaning from the visual. In the 1990s, arts educator Philip Yenawind defined visual literacy as:

> … the ability to find meaning in imagery. It involves a set of skills ranging from simple identification—naming what one sees—to complex interpretation on contextual, metaphoric, and philosophical levels. Many aspects of cognition are called upon, such as personal association, questioning, speculating, analyzing, fact-finding, and categorizing. Objective understanding is the premise of much of this literacy, but subjective and affective aspects of knowing are equally important.[4]

In the past decade, definitions of visual literacy have incorporated new language and shifts in meaning, reflecting changes in technology, increasing interdisciplinary image use, and the importance of visual media in contemporary culture, particularly as a communication tool. The vocabulary of *communication*, *messages*, and *cues* or *codes* appears frequently, as does the language of individual participation in visual culture by way of *visualizing* or *composing*. Larry Johnson of the New Media Consortium says "[v]isually literate individuals have an imaginative ability to see and understand the messages communicated with images, as well as to create, modify, and use visual cues and images."[5] Susan Metros defines visual literacy as "the ability to decode and interpret (make meaning from) visual messages and also to be able to encode and compose meaningful visual communications. It includes the ability to visualize internally, communicate visually, and read and interpret visual images."[6]

Recent definitions of visual literacy typically refer to an individual's ability to both analyze and produce visual materials.[7] As Eva Brumberger says, "the richest definitions (of visual literacy) include both an interpretive and a productive component. In other words, they stipulate that the ability to analyze and interpret images and other visual material, although critical, is not by itself sufficient for full visual literacy; it must be accompanied by some ability to create visual material."[8] Image production is sometimes seen as a pathway to interpreting and understanding visual materials.[9] This focus on both interpretation and creation appears in the K-12 education literature as well. The North Central Regional Educational Laboratory (NCREL) and the Metiri Group's *enGauge 21st Century Skills* define visual literacy as: "The ability to interpret, use, appreciate, and create images and video using both conventional and 21st century media in ways that advance thinking, decision making, communication, and learning."[10]

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literacy. The 2003 *Visual Literacy White Paper*, commissioned by Adobe Systems, advocates for early experimentation with technologies such as image software and digital

photography to develop technical skills associated with visual literacy.[11] Carole Ann Fabian describes how "[v]isual literacy skills…occur at the intersection of scholarly research and technical literacies."[12] Barbara Jones Kavalier and Suzanne L. Flannigan note that digital and visual literacies are intertwined.[13] Visual literacy has been articulated as "digital visual literacy," which Ann Morgan Spalter and Andries van Dam define as those skills related to creating and understanding digital visuals.[14] Maria D. Avgerinou asserts that definitions of visual literacy that do not emphasize technology are actually insufficient in contemporary digital culture.[15]

Visual literacy has also been associated with a broader set of literacies perceived as critical for contemporary learners. Scholars have used terms such as *21st century literacy*, *multimodal literacy*, *transliteracy*, and *metaliteracy* to describe this new approach to learning.[16] Transliteracy, for example, involves working across multiple literacies to construct meaning.[17] As Tom Ipri writes, transliteracy "is not about learning text literacy and visual literacy and digital literacy in isolation from one another but about the interaction among all these literacies."[18] Metaliteracy stresses the similarities and connections between different literacies, emphasizing higher order thinking and collaborative knowledge production over skill development. Thomas P. Mackay and Trudi E. Jacobson include visual literacy as one of multiple interconnected literacies in a metaliteracy framework.[19]

Student Use of Visual Materials

Recent studies of student use of visual materials in higher education have provided important information about student image-related skills and behaviors. Study results show a need for student visual literacy development since students' visual competencies are not always aligned with faculty expectations or academic demands. Student social media practices intersect with academic image use, and student visual literacy skills must span these spaces.

Youngok Choi and JungWon Yoon's studies of student image searching report that students typically begin their image research on the Web, using Google Images most of the time.[20] Andrea Lisa Nixon and others, in their study of curricular uses of visual materials, find that students also consult library image resources and seek assistance with image research, but typically only after an initial Web search.[21] Consistent with these findings, Jennifer Mayer and Cheryl Goldenstein's survey of image support in academic libraries reports that 67 percent of librarian respondents receive occasional or frequent requests for images from students and 85 percent instruct students on how to find images.[22] Students search for images using descriptions of what they expect to see in an image (events, people, places) but often encounter difficulty because images are not always accompanied by complete textual information or keywords describing visual or subject content.[23]

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Studies show that while students make at least some effort to evaluate images and their sources as part of the selection process, their practices are inconsistent. Choi states

that some students in her study considered the reliability of image sources as a factor in determining image usefulness.[24] Brumberger describes how students in her study were wary of image manipulation in the media but critiqued images inconsistently.[25] Alison J. Head and Michael B. Eisenberg, in their 2010 Project Information Literacy report, state that 51 percent-62 percent of students (depending on discipline) often or always evaluated the information presented in charts.[26] One local study reports no observation of students evaluating images and their sources.[27]

Appropriate use and production of images in academic work appear to be a challenge for many students. In studies by both Nixon and others, and David Green, faculty convey dissatisfaction with students' abilities to express themselves visually, make effective arguments with visuals, synthesize concepts in their own visual products, develop aesthetically engaging presentations, and coordinate visuals with other information.[28] Brumberger describes how students lack technical skills for producing visual communications, while students themselves report difficulties with using available technology and software to manipulate images and video.[29]

Students tend to exhibit less comfort and skill with observing, interpreting, analyzing, and discussing visual information than they do with textual information, and do so with less specificity.[30] Faculty expect students to be able to write detailed analyses of visual materials and use images as evidence in their arguments, but find students lacking in these skills.[31] Students tend to rely heavily on the information associated with images to make sense of what they see; for example, students in Choi's study found that accompanying textual information "inspired new ideas or a contextual understanding of the image."[32]

Copyright is often a consideration for students when selecting images,[33] though it is unclear how this affects their image choices or use. In their dealings with digital materials generally, John Palfrey and others find that students are not well informed about either the rights or the restrictions of copyright law.[34] In one evaluation survey for a new series of undergraduate information and media literacy workshops, students specifically stated that they would like more information about copyright for media and images.[35] Students do not always provide complete citations for images in their projects and presentations.[36] In Mayer and Goldenstein's study of image support in academic libraries, librarians expressed a concern for helping students use images ethically.[37]

Students often share and create visual information through social media sites and work with images across academic and personal spaces. Lee Rainie, Joanna Brenner, and Kristen Purcell report that among 18–29 year-old internet users, 67 percent post photos they have taken themselves to websites, and 52 percent take images they have found online and share or repost them on image-sharing sites.[38] In the process of producing and sharing images online, students are contributors in an emerging digital participatory culture: more than consumers, participants create and remix content as part of social networks that may include academic groups and activities. Henry Jenkins and others argue that in order for students to be "full, active, creative, and ethical participants in this emerging participatory culture," core media literacy skills are needed.[39] These are defined as play, performance, simulation, appropriation, multitasking, distributed cognition, collective intelligence, judgment, transmedia navigation, networking, and negotiation. Howard Rheingold rakishly describes five social media competencies

similarly as attention, crap detection, participation, collaboration, and network smarts.[40] Many of these social media skills overlap with digital visual literacy skills; in particular, the abilities to evaluate the reliability and credibility of digital information (judgment, crap detection), to "meaningfully sample and remix media content" (appropriation), to "follow the flow of stories and information across multiple modalities" (transmedia navigation), and to reflect on and make ethical choices as participants and communicators (participation).[41] Students need to learn how to be critical consumers and creators of visual media in general and as part of social media networks that often intersect and overlap with academic networks.

Visual Literacy and the Library

In the library literature, visual literacy has traditionally been understood in terms of information literacy, with a focus on locating images, evaluating and selecting image resources, and using and citing images.[42] Images are discussed as "visual information,"[43] and visual literacy in this context has sometimes been described as "visual information literacy."[44] Librarians have observed parallels between visual literacy skills and the critical thinking skills required of information literacy, and have shown how the *Information Literacy Standards* can be applied to the tasks of researching and understanding visual materials.[45] New and expanded conceptualizations of information literacy are broadening possibilities for library involvement with visual literacy. Mackey and Jacobson frame information literacy as a metaliteracy that includes visual literacy.[46] Robert Schroeder and Ellysa Stern Cahoy assert that "viewing information literacy as an integrated literacy," including visual and other literacies, offers new opportunities for librarian collaboration with faculty and other academic professionals to advance student learning.[47]

Librarians are increasingly incorporating the visual aspects of information into information literacy instruction.[48] Lucy Wall Stylianopoulos approaches the teaching of "image literacy" as a subset of information literacy, whereby students learn to recognize the need for images, locate images, evaluate available image options, and use images appropriately.[49] Benjamin R. Harris describes how librarians can support both visual and information literacy objectives through classroom activities that teach knowledge of visual conventions, critical viewing, and visual thinking, among other skills.[50] Several other authors provide examples of instructional methods that merge visual literacy and information literacy objectives across the disciplines.[51]

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Nerissa Nelson asserts that image interpretation and analysis fall outside the traditional domain of librarians and are skills more appropriately taught within discipline-specific

contexts.[52] James Marcum, however, argues that the interpretation of visual information falls solidly within the realm of information literacy and that hands-on skills such as image manipulation are needed in addition to critical thinking skills.[53] Marcum clearly describes this new role for librarians when he states that "[i]t is imperative to move into the new world, whether it is described as electronic, digital, postmodern, or an age of information…librarians must become multi-literate" and libraries must "recast the model of information literacy to embrace multiple literacies."[54] As part of this change in the scope of library instruction, some librarians are also supporting the development of student media production skills. Working in collaboration with teaching faculty and other academic professionals, librarians can play an important role in helping students learn to create visual materials.[55]

Visual Literacy in the Context of Learning Standards

Responding to the changing learning environment of the 21st century, several educational associations—most of them K-12—have authored national learning standards that articulate skills and competencies for the digital age. These learning standards assert that the proliferation of digital technology and visual media has made it essential for educators to address knowledge and skills beyond traditional textual literacy. As the National Council of Teachers of English (NCTE) states, students must now master multiple literacies because technology has increased the "intensity and complexity of literate environments."[56]

Visual literacy is included as an essential digital-age skill set in NCREL and the Metiri Group's *enGauge 21st Century Skills* and the American Association of School Libraries (AASL)' *Standards for the 21st Century Learner.*[57] NCTE, which writes standards for all levels of education (including higher education), argues that students in the 21st century should be able to "create, critique, analyze, and evaluate multimedia texts."[58] Inclusion of visual literacy in higher education standards is limited. The Association of American College and Universities incorporated visual communication into their essential learning outcomes in 2002 but excluded visual competencies from the 2007 version.[59] Peter Felten and others have called attention to this regressive development in higher education.[60]

Although not always explicitly linked, general competencies essential to visual literacy—critical thinking, communication, collaboration, creativity, and innovation—appear in various contemporary learning standards. According to NCREL and the Metiri Group, students must use critical thinking skills to "plan and conduct research, manage projects, solve problems, and make informed decisions." This can include visual thinking skills so that students can "decipher, interpret, detect patterns, and communicate using imagery." In addition, through the use of visualization tools, students "make their thinking visible in all academic areas." [61]

Contemporary learning standards also place importance on a student's ability to create relevant, meaningful, and ethical academic products. NCREL and the Metiri Group stress that students in the 21st century must be creators of high-quality "knowledge products" and need the skills to be "knowledgeable designers, composers, and producers of visual information."[62] AASL specifies that these products should "apply to authentic, real-world contexts."[63] According to the International Society for Technology

in Education, students must learn how to "create original works as a means of personal or group expression," and do so with an understanding of what it means to practice "digital citizenship" —that is, to use, remix, and share products ethically and legally.[64]

Visual Literacy Learning Outcomes

There has been limited focused discussion of the specific skill set students need in order to be visually literate. NCREL and Metiri Group's *enGauge 21st Century Skills* list seven characteristics of visually literate students.[65] Anne Bamford's *Visual Literacy White Paper* includes some specific visual literacy competencies, with a list of seven broad skills, ideas for exploring image syntax and semantics, and questions to guide exploration of meanings in images.[66] Metros and Joanne Dehoney have developed a "New Media Design Rubric" for assessing student products using visuals.[67] Several other authors have provided short lists of general competencies.[68] Table 1 lists these visual literacy competencies in relation to the *Visual Literacy Standards* and *Information Literacy Standards*. The *Visual Literacy Standards* are the first to articulate comprehensive visual literacy standards, performance indicators, and learning outcomes.

Visual Literacy Standards, Student Learning, and the Role of Libraries

The *Visual Literacy Standards* provide a comprehensive framework for teaching visual literacy skills. As with other areas of student learning, effective visual literacy instruction must be supported by detailed learning outcomes and shaped by an iterative assessment and instruction process. Asserting the importance of visual literacy and including visual materials in the curriculum are useful strategies, but cannot alone build student visual literacy. Visual literacy must be a focus of instruction, not an assumed attribute, as Deandra Little, Peter Felten, and Chad Berry explain: "Images are different from texts, and developing visual literacy will require deliberate and reiterative practice, not merely a glance at the occasional multimedia source."[69] Students must be taught image-related skills and practice these consistently across the disciplines and throughout their college careers. According to the Visual Resources Association, "[s]tudents need assistance using visual information and developing digital literacies for their academic exercises. This includes identifying reliable image sources, judging the quality of images and associated descriptive data, accurate identification of historical content, and understanding intellectual property and how to cite images in their writing and assignments."[70] The learning outcomes in the *Visual Literacy Standards* offer tools to support visual literacy instruction, image-related skill development, and student visual literacy learning across the curriculum.

The *Visual Literacy Standards* consist of seven skill areas for images: defining the need, finding and accessing, interpreting and analyzing, evaluating, using, creating, and understanding ethical and legal issues. Key skills from each standard are illustrated in Figure 1. The *Visual Literacy Standards* can be used either as a whole or in part, depending upon the needs of students, instructors, and librarians. The learning outcomes that are described within each standard can be applied to semester-long courses, stand-alone class activities, one-on-one consultations, distance learning situations, and online instructional resources. The seven standards and their accompanying performance indicators from

Table 1.
A Comparison of Visual Literacy Competencies

"ACRL Visual Literacy Competency Standards for Higher Education"	"ACRL Information Literacy Competency Standards for Higher Education"	Bamford, *The Visual Literacy White Paper*	NCREL and the Metiri Group, "EnGauge 21st Century Skills"	Metros and Dehoney, "New Media Design Rubric"	Spalter and van Dam, "Digital Visual Literacy"	Avgerinou, "Re-Viewing Visual Literacy"
Standard One. The visually literate student determines the nature and extent of the visual materials needed.	Standard One. The information literate student determines the nature and extent of the information needed.					
Standard Two. The visually literate student finds and accesses needed images and visual media	Standard Two. The information literate student accesses needed information effectively and efficiently.					

Table 1. Continued.

effectively and efficiently.				
Standard Three. The visually literate student interprets and analyzes the meanings of images and visual media.	To be visually literate, a person should be able to: Understand the subject matter of images. Analyze and interpret images to gain meaning within the cultural context the image was created and exists. Analyze the syntax of images including style and composition. Analyze the techniques used to produce the image. Grasp the synergy, interaction, innovation, affective impact and / or "feel" of an image.	Students who are visually literate: Understand basic elements of visual design, technique, and media. Are aware of emotional, psychological, physiological, and cognitive influences in perceptions of visuals. Comprehend representational, explanatory, abstract, and symbolic images.	Digital visual literacy is the ability to: Make decisions on the basis of digital visual representations of data and ideas.	Visual literacy competencies: Knowledge of Visual Vocabulary: Knowledge of the basic components of visual language. Knowledge of Visual Conventions: Knowledge of visual signs and symbols, and their socially agreed meanings Visual Discrimination: The ability to perceive differences

between two or more visual stimuli

Visual Association: The ability to link visual images that display a unifying theme.

Reconstructing Meaning: The ability to visualize and verbally (or visually) reconstruct the meaning of a visual message solely on the evidence of given information which is incomplete

Constructing Meaning: The ability to

Table 1. Continued.

						construct meaning for a given visual message on the evidence of any given visual information
Standard Four. The visually literate student evaluates images and their sources.	Standard Three. The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.	Evaluate the aesthetic merit of the work. Evaluate the merit of the work in terms of purpose and audience.	Are informed viewers, critics, and consumers of visual information.	Critically evaluate digital visual materials (two-dimensional, three-dimensional, static, and moving).		Critical Viewing: Applying critical thinking skills to visuals.
Standard Five. The visually literate student uses images and visual media effectively.	Standard Four. The information literate student, individually or as a member of a group, uses information		Are effective visual communicators.		Project dimensions: Concept Originality: Ability to define problems, explore various	Visual Thinking: The ability to turn information of all types into pictures, graphics, or

Standard Six. The visually literate student designs and creates meaningful images and visual media.	effectively to accomplish a specific purpose.	possibilities, and develop unique solutions. Aesthetic Quality: Sensitivity to the principles of design and successful fulfillment of project criteria Presentation: Display of technical skill, ability to follow directions, craftsmanship.	forms that help communicate the information.
		Are knowledgeable designers, composers, and producers of visual information. Are expressive, innovative visual thinkers and successful problem solvers.	Use computers to create effective visual communication.
Standard Seven. The visually literate student understands			Visualization: The process by which a visual image is formed (Verbo-) Visual Reasoning: Coherent and logical thinking that is carried out primarily by means of images. Visual Reconstruction: The ability to reconstruct a partially occluded visual message in its original form.
Standard Five. The information literate student understands		Sources / Citations: Depending on the nature of the project, authors	

Table 1. Continued.

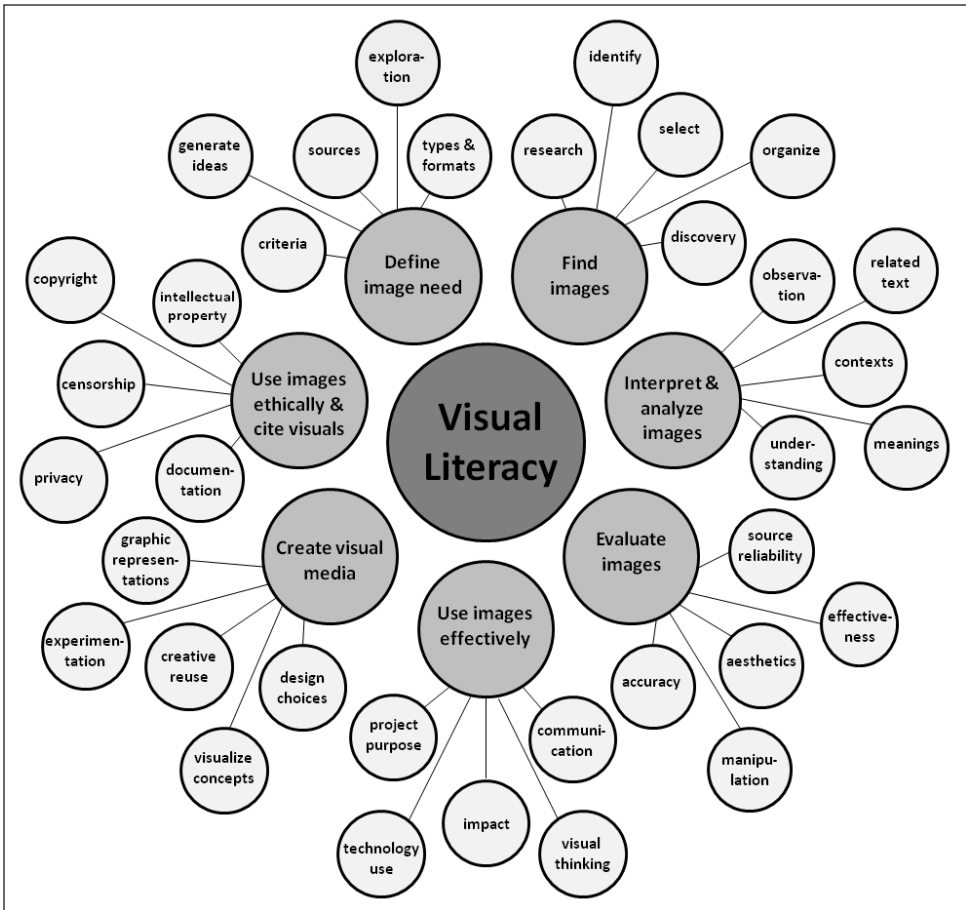|		
many of the ethical, legal, social, and economic issues surrounding the creation and use of images and visual media, and accesses and uses visual materials ethically.	many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.	may need to correctly cite project sources.

Figure 1. Visual Literacy Array based on ACRL's Visual Literacy Standards

the *Visual Literacy Standards* are included below, with discussions of both the learning outcomes for each standard and the ways libraries can contribute to student learning in each area.

Standard One

The visually literate student determines the nature and extent of the visual materials needed.

1. *The visually literate student defines and articulates the need for an image.*
2. *The visually literate student identifies a variety of image sources, materials, and types.*

Standard One establishes a foundation for students to begin thinking about how images function within academic projects, how images are described, and how they communicate information. This Standard encourages exploration to help students expand their understanding of visual materials, broaden the range of image types and sources they may consider, and develop a thoughtful and deliberate approach to visual content. Head and Eisenberg report that "students begin their course-related research activities

in search of *research contexts*, (which) entails getting information for interpreting and defining information need."[71] Through the learning outcomes in Standard One, students build research contexts for their image investigations and become comfortable with a research process whereby text and image interact and pose new questions and opportunities for discovery. As students practice exploring image resources for academic use, they become better prepared not only for finding images but also for higher-level critical thinking about images, image sources, and visual communication.

A useful starting point for working with images is to articulate the purpose of an image in a project and the scope and environment in which it will be used. Students must consider what the required image might look like, the information it might contain, the subject it should represent, and concepts or terms that would describe such an image. In Standard One, students are asked to increase their familiarity with available images and sources, and use new encounters with visual materials to generate ideas for relevant image content. Possibilities for modifying or repurposing images to produce new visual meanings may also emerge from these explorations. Basic skills such as identifying different image and visual media types, recognizing ways images can be used to communicate data and information (such as charts, graphics or models), and identifying any applicable discipline-specific conventions for image use provide groundwork for further work with visual content.

Libraries have traditionally been involved with introducing students to a variety of resource types and sources as part of the information search process. The approach of Standard One is familiar to librarians who are accustomed to helping students frame their research questions in relation to information sources, and complements Standard One of the *Information Literacy Standards*. Librarians can use Visual Literacy Standard One to help students develop a context for image research by creating new opportunities for students to interact with visual materials, by addressing the unique characteristics of image resources, and by working with students to situate images purposefully in their research activities and academic work.

Standard Two

The visually literate student finds and accesses needed images and visual media effectively and efficiently.

1. *The visually literate student selects the most appropriate sources and retrieval systems for finding and accessing needed images and visual media.*
2. *The visually literate student conducts effective image searches.*
3. *The visually literate student acquires and organizes images and source information.*

Standard Two addresses the skills students need to find visual materials for use in academic projects. Image research can differ fundamentally from text-based research, and students are not always able to transfer text-based research skills to visual materials. As Choi notes, "there is a difference in search interests as well as in query types between textual search and image search."[72] Students often rely heavily on Web search engines for image content discovery to the exclusion of more appropriate sources. And they may rely on text-based search strategies that are often ineffective for retrieving visual

materials. Standard Two encourages students to select the most appropriate sources for visual materials, to use multiple strategies to find and access images, and to develop the technical and organizational skills needed to integrate images into academic work.

The learning outcomes in Standard Two ask students to identify a variety of image sources, such as subscription image databases, institutional repositories, museum and archive online collections, image sharing websites, and print resources, and also examine how Web image search engines retrieve images. Students must be able to make connections between how they plan to use an image and the most appropriate image sources for that use. Images may have restrictions on reuse that must be understood early in the research process. The relationship between images and text is an important aspect of image research; image research is often most effective when performed jointly with text-based topical research. Students must have a sense of the type of textual information that often accompanies images, such as captions and tags, and the kind of textual description that is often not included, such as complete descriptions and subjects. Additional discovery strategies such as browsing, using visual search engines, and social linking should also be part of a student's repertoire of image research

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skills. Students should be encouraged from the early stages of any research project to incorporate image research. An iterative research process involving the use of multiple formats and sources concurrently is often an ideal approach.

The search and retrieval of information in multiple formats has traditionally been supported by libraries and is addressed in the *Information Literacy Standards*. Libraries develop image collections and subscribe to image databases, and librarians regularly assist patrons with finding and accessing images. Many academic libraries have developed online image research guides. According to Choi, the students in her study "expected that a library would offer relevant guidance or sources for image resources related to their tasks."[73] Finding and accessing images may be the aspect of visual literacy most familiar to the greatest range of academic libraries and librarians, and users expect libraries to assist them in this area.

Standard Three

The visually literate student interprets and analyzes the meanings of images and visual media.

1. *The visually literate student identifies information relevant to an image's meaning.*
2. *The visually literate student situates an image in its cultural, social, and historical contexts.*
3. *The visually literate student identifies the physical, technical, and design components of an image.*
4. *The visually literate student validates interpretation and analysis of images through discourse with others.*

Standard Three focuses on the ways meanings are created and communicated through visual media and addresses the interpretive and analytical skills unique to the under-

standing of visual materials. Students are often unaccustomed to looking carefully at images and need to develop skills of observation. Little, Felten, and Berry write that "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."[74] Working with images and visual media in an academic environment also requires that students develop a deeper engagement with what Bamford calls *visual semantics,* or the way that "images relate more broadly to the issues in the world to gain meaning."[75] Standard Three encourages students to learn how image production is embedded within and highly influenced by cultural values and social constructs.

The process involved in "reading" images and visual media is often subjective, and multiple meanings may be transmitted through a visual work. The learning outcomes in Standard Three help students approach a visual object systematically to move beyond initial subjective reactions and to arrive at a multifaceted understanding of the image. Students are asked to look carefully at an image and observe details that may not have been noticed at first glance. They should be able to identify various pictorial, graphic, technical, and design components of visual materials, and examine any related visuals and text. Historical and cultural factors, such as time period, geography, and social and political structures provide essential information relevant to the meaning of the image. Because images can be powerful conveyors of cultural identifiers like gender and ethnicity, students must develop a critical eye for recognizing ways differences are portrayed in visual representations. In many cases what has been omitted from an image can be just as important as what has been included, and choices made during image production to construct meaning or influence interpretation should be explored. Images often have an afterlife beyond their original context; students should consider how meanings may have changed over time and how new contexts create new meanings for images.

Image interpretation and analysis are a key part of the research and selection process. It is difficult to find and select appropriate images without an interpretive and analytical framework, for an image must be understood accurately in order for it to be used effectively in academic work. Librarians can play an important role in helping students understand image content. Particularly in reference and instruction settings, librarians have a unique opportunity to work with students to recognize clues they can use to interpret visual materials, such as accompanying information, historical context, and aesthetic conventions. Today's students are increasingly using visual materials as primary sources, evidence, and tools for communication. Contemporary librarians must be prepared to collaborate with faculty and other academic professionals to assist students with the interpretation and analysis required to make sound choices when selecting images and working with images in an academic context.

Standard Four

The visually literate student evaluates images and their sources.

1. *The visually literate student evaluates the effectiveness and reliability of images as visual communications.*
2. *The visually literate student evaluates the aesthetic and technical characteristics of images.*

3. *The visually literate student evaluates textual information accompanying images.*
4. *The visually literate student makes judgments about the reliability and accuracy of image sources.*

Standard Four empowers students to evaluate images and image sources, and to engage critically with visual materials. Metros and Kristina Woolsey explain the importance of this skill in today's society: "Seeing is no longer believing. A consumer of images must be able to judge accuracy, validity, and worth. This holds particularly true in today's digital age, when images can be effortlessly manipulated, cropped, and disseminated by anyone with a basic drawing package and an Internet connection." Students must learn to cultivate *visual judgment* through which they can become "constructive critics of visual information."[76] The skills described in Standard Four help students to develop judgment about images as visual communications and as aesthetic, technical, and informational objects.

The learning outcomes in Standard Four ask students to critique a range of visual strategies used to communicate ideas and concepts, and to evaluate the effect of these strategies on image quality and reliability. Students must identify persuasive techniques and visual conventions and assess how these may have been used to convey meaning and influence interpretation. They are challenged to recognize and critique the effect of image editing on the reliability of an image, and consider the ways in which media images can be edited and (re)contextualized to influence viewer interpretation, both subtly and overtly. A key learning outcome in this standard is the ability to determine the accuracy of graphical representations of data and information, especially since visualizations can be produced in myriad ways. For example, it may be necessary to evaluate whether a graphic conveys a credible representation of factual data or determine whether an advertisement reflects a point-of-view or bias that calls for further analysis. Accompanying text and image source information should be used to help determine an image's accuracy and reliability. Design elements and principles, such as color and composition, and technical characteristics, such as format and resolution, are also factors that determine the overall quality of an image. Judgments must be made about image sources as well, using both traditional criteria such as authority and point of view, and considering evaluations of image and information quality. Students must critique how image sources create contexts and influence image meaning.

Librarians have a rich history of working with students to assess the reliability and accuracy of sources and to evaluate information. The image-specific skills described in Standard Four are an extension of the text-based evaluations familiar to most librarians. These skills are essential for a comprehensive critical evaluation of visual materials. Because the aesthetic and technical characteristics of visual materials are closely intertwined with meaning and worth, librarians are called upon to help students develop all of the various skills used in making judgments about the value of visual materials. As Harris suggests, "information literacy instructors and advocates have become increasingly aware of the fact that students require some of the same assistance provided in relation to written sources as they learn to locate, evaluate, and use images."[77] Librarians can help students ask the multifaceted questions necessary to arrive at thoughtful evaluations of images and image sources.

Standard Five

The visually literate student uses images and visual media effectively.

1. *The visually literate student uses images effectively for different purposes.*
2. *The visually literate student uses technology effectively to work with images.*
3. *The visually literate student uses problem solving, creativity, and experimentation to incorporate images into scholarly projects.*
4. *The visually literate student communicates effectively with and about images.*

Standard Five addresses the effective use of images and visual media in academic work. Students are called upon to use visual materials across the curriculum, yet they often do not have the skills needed to use images appropriately in a scholarly context. An article in *The Chronicle of Higher Education* quotes Elizabeth Losh as saying that students commonly think that "all they need is something that's got some visual sizzle, and they don't need to address the kinds of research objectives that you might want them to address."[78] Standard Five encourages students to approach their use of image content deliberately and to plan strategically for image use within particular projects. Whether in a paper, presentation, multimedia project, or exhibition, students must be able to use images appropriately and effectively in an academic context, aligned with academic objectives.

The learning outcomes in Standard Five emphasize that students must be able to both select images relevant and appropriate to their topic and purpose, and incorporate them effectively into the new context of their academic project. This involves careful consideration of the meanings and impact that visual materials carry, as well as decisions about image types, formats, display, and layout, and the quantity of images used relative to other information. Students must possess basic technical skills and familiarity with image software, tools, and applications required to edit, manage, store, present, and share images. Problem solving, creativity, and experimentation in incorporating images into scholarly projects are key aspects of the Standard Five learning outcomes. Students should be encouraged to explore multiple possibilities for using images and to think critically, creatively, and visually about their options and decisions. Through visual thinking and creative experimentation with images, they can successfully arrive at the most effective visual solutions and end products. In addition to communicating *with* images, students must be able to communicate *about* images in papers, presentations, and discussions. Through description, analysis, and evaluation, visually literate students are able to present their own ideas and arguments about images and visual products, as well as reflect on the effectiveness of their own visual communications.

Librarians commonly help students and faculty use the information they find and incorporate it into new contexts and intellectual products. As students' use of non-textual information increases across all disciplines, so too does their need for support with using images and visual media. Many librarians are taking an active role in helping students use visual media in their academic work, both directly and through collaboration with teaching faculty, technologists, and other academic professionals. Examples of this type of activity include librarians helping students use images effectively in digital storytelling,[79] and librarian involvement with a zine production assignment wherein students used media images to illustrate social inequality.[80] The opportunities for librarians to

provide resources and instruction in effective image use will only increase as student work continues to include multiple media types. Libraries can also support student visual media use by providing appropriate public computing services and student work spaces. Integrated facilities for student use of all formats of information could ideally be situated in the library, with librarians and other academic professionals collaborating to provide expertise and assistance to students and faculty who are using images and image-related technologies.

Standard Six

The visually literate student designs and creates meaningful images and visual media.

1. *The visually literate student produces visual materials for a range of projects and scholarly uses.*
2. *The visually literate student uses design strategies and creativity in image and visual media production.*
3. *The visually literate student uses a variety of tools and technologies to produce images and visual media.*
4. *The visually literate student evaluates personally created visual products.*

Standard Six addresses the importance of producing images as an essential component of visual literacy. As Avgerinou succinctly states, a visually literate student is able to "read / decode / interpret visual statements, as well as write / encode / create visual statements."[81] In an academic participatory culture, students are expected to make contributions to research, learning, and communication as knowledge producers. Self-expression through creating visual products also helps students develop their critical viewing, interpretation, and evaluation of others' works as they experiment and make choices about the visual presentation of ideas. Standard Six provides a framework for helping students produce effective visual materials and develop creative and analytical thinking skills through this production process.

Students are expected to create visual materials for a range of academic uses across subject disciplines. The learning outcomes in Standard Six encourage students to be prepared to produce meaningful visual products for a variety of purposes, such as representing and communicating concepts, narratives, and arguments, and accurately and appropriately displaying data and information. These products might take the form of concept maps, presentations, storyboards, posters, charts, maps, diagrams, models, infographics, or other formats. The knowledge and application of design strategies and creativity are important parts of communicating visually. Basic design strategies need not be restricted to the visual arts, and the fundamentals of visual language can be applied to the creation of visual products across the disciplines. While various disciplines will approach visuality differently, basic skills in design can be taught

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and learned. Creativity can be levereged to incorporate existing image content into new visual products. With the easy availability of digital technologies, students have many opportunities to become creators of visual content and contributors to a shared visual culture. These technologies must be used appropriately and effectively, however, and technology and visual products must be aligned with academic goals.

Libraries have traditionally been involved with teaching students about the knowledge production process, rather than helping them produce knowledge themselves. The *Visual Literacy Standards* differ from the *Information Literacy Standards* in their inclusion of a creation component. This presents new opportunities for libraries to expand their role as partners in student learning. Joan K. Lippincott advocates that librarians and other information professionals work with faculty to help prepare students to be content creators by using skills associated with a variety of literacies, including media literacies. Librarians and other information professionals can do this, according to Lippincott, by "helping to identify relevant skills, assisting with the design of engaging assignments to incorporate those skills into the curriculum, suggesting rubrics for the assessment of multimedia assignments, and developing learning objects and/or participating directly in teaching students about these areas."[82] As they assign more projects requiring multimedia and design skills, teaching faculty look to libraries to provide this kind of support. Ray Bailey and others describe several examples of library and faculty collaboration on video and multimedia projects and assert that this is an outreach opportunity for librarians who can "showcase their skills and resources" and "reiterate and solidify their usefulness in academia."[83] Libraries may also find new opportunities to partner directly with students. Margeaux Johnson and others describe a student-initiated, peer-taught media production workshop facilitated by librarians in the library at the University of Florida, but organized and taught by students.[84] Katharine A. Webb and others found that libraries can offer students a collaborative learning environment both pedagogically and physically to help them create meaningful multimedia projects. Their study calls for further exploration into "multimedia learning as a library service."[85] While challenged to develop staff expertise and provide appropriate facilities for supporting this work, libraries stand to enhance existing partnerships and expand their relevance to 21st century learners by serving as a resource for visual media production.

Standard Seven

The visually literate student understands many of the ethical, legal, social, and economic issues surrounding the creation and use of images and visual media, and accesses and uses visual materials ethically.

1. *The visually literate student understands many of the ethical, legal, social, and economic issues surrounding images and visual media.*
2. *The visually literate student follows ethical and legal best practices when accessing, using, and creating images.*
3. *The visually literate student cites images and visual media in papers, presentations, and projects.*

Standard Seven focuses on the ethical, legal, and social aspects of using visual materials. While these issues are relevant to all types of information and communication, visual

materials present unique challenges and require additional discussion and investigation with students. Palfrey and others point out that in today's media-saturated learning environment, it is critical that educators help students to "operate in legal and empowered ways in the digital world."[86] This is particularly true of copyright issues related to visual media since, as Barbara Rockenbach and Carole Ann Fabian write, "the rights framework for visual material, especially visual objects most often used in teaching and research settings, is so complex and, in many cases, not well articulated in legal documentation."[87]

Students should explore intellectual property, copyright, and fair use concepts as they apply to images and build a level of knowledge that enables them to use visual materials ethically and responsibly. The learning outcomes in Standard Seven ask students to develop an understanding of how to source and use images appropriately, looking at licenses and institutional policies on access and use, and following best practices with regard to stated guidelines. Individuals' intellectual property rights as content creators require discussion as well. In an era of social media, it is critical that students become familiar with issues of privacy, ethics, and safety that may arise when creating, using, and sharing images. As they create and distribute images and video online and via social networks, students form an online identity with consequences for their academic and professional lives. They must consider the impact of the personal information images carry and demonstrate respect for others' privacy. In addition, the intellectual content of images and the rights of image creators need to be handled ethically when the content is shared. In an environment in which remixing content and creating "mash-ups" is common practice, it is essential to track copyright and use information as images are reproduced, altered, and disseminated to new contexts.

> **In an environment in which remixing content and creating "mash-ups" is common practice, it is essential to track copyright and use information as images are reproduced, altered, and disseminated to new contexts.**

Image citation is a foundational issue in academic contexts; images are part of the scholarly conversation that is supported by consistent citation practices. Students need to be aware of what should be included in an image citation, how to format image citations by using accepted documentation styles, and how to adapt citations to a variety of end products (presentations or posters, for example). Attaching attribution and rights information to personally created images is also important so others can source, cite, or use them appropriately.

Libraries have long functioned as knowledge sources about bibliographic citation practices and about copyright exceptions affecting scholarly materials, such as fair use and preservation. Ethical and legal considerations are thoroughly addressed by the *Information Literacy Standards*. In collaboration with faculty and writing centers, libraries are in a position to provide important guidance to students about citing images in academic work. Librarians are also well positioned to help students learn about and navigate the copyright issues associated with images and visual media. In general, as Metros says, students should "be aware of the etiquette and legalities of ownership, which include how to properly cite authorship and credit sources."[88] Harris notes that "instruction

that deals with distinctions between public domain, open access, and other types of copyright restrictions can inform the critical thinking of the researcher."[89] Libraries can work with students to identify and leverage content available for re-use (for example, public domain and Creative Commons images), to disambiguate between copyright and licensing stipulations, and to make deliberate analyses and decisions regarding fair use. Standard Seven augments the *Information Literacy Standards* to highlight particular ethical and legal issues related to image use, and libraries can play a key role in helping students develop competence with using visual materials ethically.

Conclusions and Suggestions for Further Study and Action

Visual literacy has emerged as a critical area for student learning across the higher education curriculum. The *Visual Literacy Standards* offer a new set of tools to help educators develop student competencies with images and visual media. Libraries, as physical and intellectual centers for student learning, can use the *Visual Literacy Standards* to provide leadership in efforts to teach and support student visual literacy. Individual libraries can expand on the work they are currently doing to support visual literacy learning by leveraging library spaces, digital collections, instruction, collaboration, and online resources. Nationally, the academic library community needs to share successes and effective visual literacy instruction strategies, as well as models for collaboration that support student visual literacy. In addition, libraries must engage with ongoing discussions about effective ways to assess visual literacy across the disciplines to improve student learning with visual materials.

Several higher education, professional, and library organizations are actively engaged with visual literacy through conference programming, publications, white papers, and editorial statements. These organizations can be resources for librarians looking to participate in visual literacy conversations and partner with other academic professionals to advance student visual literacy. ACRL's Image Resources Interest Group (IRIG),[90] which sponsored the development of the *Visual Literacy Standards*, provides excellent resources for librarians who are interested in learning more about supporting visual literacy. IRIG maintains a Visual Literacy Community of Practice wiki that contains a variety of resources, including a bibliography and links to teaching materials. [91] IRIG also develops programming and provides forums for presentations and discussions about visual literacy at ALA and ACRL conferences. The International Visual Literacy Association[92] consists of researchers, educators, and practitioners from across the disciplines. Members have access to numerous resources including the *Journal of Visual Literacy*, which is published semi-annually. The Art Libraries Society of North America (ARLIS)[93] has sponsored art-oriented visual literacy programming at its conferences, and its publication *Art Documentation* regularly includes articles about visual literacy practice in art libraries. The Visual Resources Association (VRA),[94] an organization for visual resources curators and image professionals, has long supported student and faculty use of visual materials in higher education. The *VRA Bulletin* has published many articles relevant to student visual literacy and image use. EDUCAUSE, an organization for educational technologists and others in higher education, published the ground-breaking *Visual Literacy White Paper* and several editorial commentaries on the importance

of visual literacy in higher education in its *EDUCAUSE Review* publication. [95] The New Media Consortium and EDUCAUSE Learning Initiative (ELI) identified visual literacy as a "Critical Challenge" in the 2009 *Horizon Report.*[96] The American Association of Colleges and Universities (AACU) has included visual literacy as a core competency in past learning standards, and has more recently published editorial statements asserting the need for student visual literacy learning. [97]

As academic libraries strive to align their services and collections with institutional priorities as well as national higher education learning goals, it is essential they participate in the current dialogue about student visual literacy learning. Libraries are expanding their activities into new areas such as scholarly communication, open access publishing, digital humanities, and data curation, and must prioritize image resources and visual literacy alongside other emerging services. The *Visual Literacy Standards* are a resource that libraries can use to contribute to this conversation. Through meaningful engagement with student visual literacy, academic libraries have the opportunity to strengthen their value and relevance to contemporary student learning, research, and knowledge production.

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