VISUAL LITERACY

BY PETER FELTEN

"The problem of the twenty-first century is the problem of the image," according to cultural theorist W.J.T. Mitchell (1995). The centuries-long domination of texts and words in culture, particularly Western culture, has come to an end. The new "pictorial turn" means that images no longer exist primarily to entertain and illustrate. Rather they are becoming central to communication and meaning-making.

Mitchell wrote about a culture saturated with images in print, television, film, and public spaces. He did not fully anticipate how, and how quickly, evolving technologies would transform our visual environment. The camera, for example, was not so long ago a specialized device that, except in hands of experts, produced low-quality pictures seen by few people. Now digital cameras are just another component in many electronic devices, and images are created to be uploaded rather than printed. The four-year old photo-sharing Web site Flickr includes more than two billion images, and in just one recent month (January 2008), more than 79 million viewers watched 3 billion videos on the three-year-old site YouTube.

This visual explosion is not only a popular-culture phenomenon. Vast scholarly archives—including the ARTstor Digital Library (www.artstor.org), NASA's Visible Earth collection (visibleearth.nasa.gov), and the American Memory site at the Library of Congress (memory.loc.gov)—make high-quality visual materials available to students, teachers, and researchers everywhere.

Our visual, screen-based world is the natural environment for many of today's college students. Our technology and culture, some would argue, are producing a large crop of visual learners—"digital natives" who are "intuitive visual communicators" and "more visually literate than previous generations" (Oblinger and Oblinger, 2005, ch. 2).

Living in an image-rich world, however, does not mean students (or faculty and administrators) naturally possess sophisticated visual literacy skills, just as continually listening to an iPod does not teach a person to critically analyze or create music. Instead, *visual literacy involves the ability to understand, produce, and use culturally significant images, objects, and visible actions.* These skills can be learned in ways analogous to textual literacy. With training and practice, people can develop the ability to recognize, interpret, and employ the distinct syntax and semantics of different visual forms. The process of becoming visually literate continues through a lifetime of learning new and more sophisticated ways to produce, analyze, and use images.

Visual literacy has appeared on the margins of the national discourse about liberal education. The AAC&U's *Greater Expectations* report (2002), for instance, contended that one of the core characteristics of an "empowered learner" would be the capacity to "effectively communicate orally, visually, in writing, and in a second language" (xi). In the AAC&U's follow-up report, *Liberal Education Outcomes* (2005), however, references to the visual disappeared, although two new literacies, quantitative and information, now complement "written and oral communication" as essential intellectual and practical skills.

This proliferation of literacies, and the emergence of new technologies that blend text and image, suggest that the time is right to rethink the very concept of literacy. Gunther Kress, in *Literacy in the New Media Age* (2003), contends that multiple "modes of representation" should replace language at the core of any understanding of literacy. In other words, being literate necessarily involves understanding much more than words and texts. James Paul Gee's stimulating *What Video Games Have to Teach Us about Learning and Literacy* (2004) makes a similar argument for what he calls the "multimodal principle," that "meaning and knowledge are built up through various modalities (images, texts, symbols, interactions, abstract design, sound, etc.), not just words" (p. 210).

In our rapidly changing world, visual literacy, whether conceptualized as a distinct set of capacities or as part of a larger multimodal literacy, should be recognized among the fundamental goals of a liberal education.

The following review will highlight four categories of resources essential for understanding visual literacy in higher education: foundations, visual cognition and perception, visual design, and teaching visual literacy.

FOUNDATIONS

Humans have created images to convey meaning for thousands of years, but the idea of educating people for visual literacy developed over the past century concurrently with new communications technologies. In the late 1960s John Debes from Eastman Kodak coined the term "visual literacy" and, with a diverse group of academics as partners,

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hosted the first national conference on the topic. This group soon evolved into the International Visual Literacy Association (www.ivla.org), which hosts an annual conference and sponsors a Web portal (www.ivla.org/portal/intro) that provides links to relevant research, teaching materials, publications, collections, and other resources.

The connection between visual literacy and emerging technologies persists. EDUCAUSE (www.educause.edu/), a leading higher education association focused on technology, has made visual literacy an important part of its agenda. Susan E. Metros and Kristina Woolsey, writing in the *EDUCAUSE Review* (2006), offer a succinct argument for why visual literacy should be "an institutional imperative." Another international consortium of academics and technologists, the New Media Consortium (www.nmc.org), has drawn on the scholarship of Kress, Gee, and others to produce an extended argument that the development of multimodal literacy is now "A Global Imperative" for higher education (www.nmc.org/pdf/Global_Imperative.pdf). The Horizon Report, produced annually by EDUCAUSE and the New Media Consortium, anticipates how emerging technologies will affect higher education. As in past years, the 2008 report focuses on how Web 2.0 tools for video, data visualization, and multimedia "mash-ups" will require "formal instruction in information, visual, and technological literacy."

The Cambridge Handbook of Multimedia Learning (2005), edited by Richard E. Mayer, summarizes the educationally relevant research on how people learn in multimodal environments; although the volume does not focus on visual literacy per se, it is an essential resource. For example, Mayer's chapter on the "Cognitive Theory of Multimedia Learning" clearly explains both the science and the implications of "the human information processes system [that] includes dual channels for visual/pictorial and auditory/verbal processing" (p. 31).

For a theoretical overview of the state of the field, James Elkins' has edited a volume, *Visual Literacy* (2007), that brings together major thinkers to consider what the concept means in diverse contexts around the globe and across the disciplines. The volume focuses primarily on cultural studies, but Elkins makes a powerful plea to "take up the challenge of providing a visual culture 'core curriculum' for all students. Images are central to our lives, and it is time they become central in our universities" (p. 8).

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Visual Cognition and Perception

The study of the physical processes involved in visual perception has both encouraged and reinforced advocates of visual literacy. Research demonstrates that seeing is not simply a process of passive reception of stimuli but also involves active construction of meaning. A typical person, for example, perceives a line drawing of a cube to have three dimensions; our eyes project depth onto a flat surface by assembling a familiar shape from a two-dimensional drawing on a sheet of paper. Proponents of visual literacy contend that if the *physical* act of seeing involves active construction, then the *intellectual* act of interpreting what is seen must require a critical viewer.

The study of the physiological and cognitive systems involved in visual perception is one of the burgeoning areas in neuroscience. Dale Purves and R. Beau Lotto (2003) offer an accessible peek into this vast field in *Why We See What We Do: An Empirical Theory of Vision*. Scientists will continue to debate Purves and Lotto's thesis that the visual system generates a "statistical reflection of visual history" rather than an accurate representation of the physical world, but since no generally accepted framework for understanding the visual system exists, the clarity and comprehensiveness of Purves and Lotto's book make it valuable to those outside the field.

Echo Objects: The Cognitive Work of Images, by Barbara Maria Stafford (2007), takes a different view into the science of sight. Stafford, an art historian, has studied neuroscience deeply. *Echo Objects* makes the compelling, if jargon-heavy, argument that since thinking is inextricably linked to images, understanding human cognition requires the integration of science and art.

Visual Design

Just as writing is essential to textual literacy, the capacity to manipulate and make meaning with images is a core component of visual literacy. Technological change has made it increasingly possible for ordinary people, not just professionals, to become visual designers. Indeed, editing with a particular graphics program has become so common as to create a new verb, "to photoshop," that means to digitally alter an image. Johanna Drucker and Emily McVarish's *Graphic Design History: A Critical Guide* (2008), a widely used college text,

is an excellent introduction to both the basic principles and the historical evolution of visual design.

Edward Tufte, a professor *emeritus* at Yale, has developed a large following for his elegant, practical, and pointed views on the visual display of quantitative data. His workshops and books, including *The Visual Display of Quantitative Information* (2nd ed., 2001), should appeal most to professionals in business, engineering and the sciences. Tufte's most recent volume, *Beautiful Evidence* (2006), includes a chapter based on his influential article, "The Cognitive Style of PowerPoint," that contends that "PowerPoint, compared to other presentation tools, reduces the analytical quality of serious presentations of evidence" (p. 157).

Despite the harsh critique, many academics rely on PowerPoint and other software to create, manipulate, and present visuals. Many campuses and technology groups (such as EDUCAUSE) offer or broker training in these technologies. For example, the University of Minnesota's Center for Teaching and Learning hosts a free online tutorial about "Active Learning with PowerPoint" (www1.umn.edu/ohr/teachlearn/tutorials/powerpoint). Lynda (www.lynda.com) is a corporation with an excellent reputation for online tutorials on the tools and techniques commonly used for visual design.

Teaching Visual Literacy

Schools have traditionally placed primary emphasis on textual literacy. Our pedadogy and academic training often focus on words and texts as the source of knowledge. As Carmen Luke (2003) explains in a provocative article on pedagogy and multimodality, the classroom is perhaps the only place where today's students are *not* "blending, mixing, and matching knowledge drawn from diverse textual sources and communication media" (p. 398).

Although a vast literature exists on teaching visual literacy in pre-collegiate settings, relevant higher education literature is only now emerging. Many of the leading books on pedagogy in higher education make at most a passing reference to visual-literacy considerations, in effect treating images as mere illustrations and ignoring the myriad of ways people make meaning by combining visuals and texts. One exception is James E. Zull's *The Art of Changing the Brain* (2002). Zull draws on "the biology of learning" to argue that faculty should make "extensive use of images to help people learn," both by teaching with visuals and by requiring students to use various visual forms to represent what they know.

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Models for doing this recently have begun appearing in many disciplines, building in part on new visualization technologies being developed as research tools. Perhaps the clearest example of this is the Spatial Perspectives on Analysis for Curriculum Enhancement (SPACE) program. Drawing on advances in geographic information systems and spatial analysis tools, SPACE's web site (www.csiss.org/space) offers an array of materials to help college faculty teach spatial thinking in the social and environmental sciences, including both "classics" like V.O. Key's 1949 work on mapping of southern politics and emerging tools like "virtual globes."

In the natural sciences, Nobel laureate Carl Wieman (2007) argues that a range of visual forms, including figures and simulations made possible by new technologies, are essential to effective scientific education. Jo Handelsman, Sarah Miller, and Christine Pfund's *Scientific Teaching* (2006) explains how using a visual frameworks and "mini-maps" can help students not only learn content in a biology course but also better understand how scientists think and how the scientific process works.

In history, Michael Coventry and colleagues from the Visible Knowledge Project (crossroads.georgetown.edu/vkp) recently presented, in the *Journal of American History* (2006), five case studies of faculty using new visual approaches to teach historical content and thinking skills. In education and psychology, Elizabeth Thomas, Nancy Place, and Cinnamon Hillyard published a pair of articles in the journal *College Teaching* (2008) that outline and assess several approaches to using "visual images in the college classroom to promote students' capacities and skills."

Faculty in composition and cultural studies have produced the deepest literature on the pedagogy of visual literacy in higher education. Lynn Z. Bloom, Donald A. Daiker, and Edward M. White's 2003 *Composition Studies in the New Millenium* includes several chapters, both provocative and practical, on visual literacy and the teaching of college writing. Brian Golfarb's *Visual Pedagogies* (2002) blends critical theory and concrete examples to show the potential of students as producers of visual and multimodal academic work. In *The Rhetoric of Cool: Composition Studies and New Media* (2006), Jeff Rice argues for a new understanding of writing as inherently net-

Resource Box I

Publications

- Association of American Colleges and Universities. (2002). *Greater Expectations: A New Vision for Learning as a Nation Goes to College*. Washington, DC: AAC&U.
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- Mitchell, W. J. (1995). *Picture Theory: Essays on Verbal and Visual Representation*. Chicago: University of Chicago Press.
- New Media Consortium. (2005). *A Global Imperative: The Report of the 21st Century Literacy Summit*. Austin, TX: NMC.
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- Stafford, B. M. (2007). *Echo Objects: The Cognitive Work of Images*. Chicago: University of Chicago Press.
- Thomas, E., Place, N., and Hillyard, C. (2008). Students and Teachers Learning to See - Part 1: Using Visual Images in the College Classroom to Promote Students' Capacities and Skills. *College Teaching, 56* (1), 23-27.
- Thomas, E., Place, N., and Hillyard, C. (2008). Students and Teachers Learning to See - Part 2: Using Visual Images in the College Classroom to Enhance the Social Context for Learning. *College Teaching, 56* (2), 74-77.
- Tufte, E. R. (2006). *Beautiful Evidence*. Cheshire, CT: Graphics Press.
- Tufte, E. R. (2001). *The Visual Display of Quantitative Information*. Cheshire, CT: Graphics Press.
- Wieman, C. (2007). Why Not Try A Scientific Approach to Science Education? *Change, 39* (5), 9-15.
- Zull, J. E. (2002). *The Art of Changing the Brain: Enriching the Practice of Teaching by Exploring the Biology of Learning*. Sterling, VA: Stylus.

worked, erasing traditional dichotomies of visual or textual, print or online.

Rice notes some irony in the recent discovery of the visual by composition scholars and teachers. Humans always have used images as one important tool for making meaning. That composition studies, and indeed most academic disciplines, are only now beginning to take visual representation seriously reflects a failure of many academics to understand human learning rather than a radical change sparked by technology and culture.

To train students to see critically and to create in multiple modes should be an essential component of a liberal education. That will require not only reenvisioning our curricula and teaching practices but also supporting faculty, librarians, and others in learning to both value and use visual representations in working with students.

Resource Box II

Web Sites

- Active Learning with PowerPoint, Center for Teaching and Learning, University of Minnesota: www1.umn.edu/ohr/teachlearn/tutorials/powerpoint
- American Memory, Library of Congress: memory.loc.gov
- ARTstor Digital Library: www.artstor.org
- EDUCAUSE: www.educause.edu
- Flickr: www.flickr.com
- International Visual Literacy Association: www.ivla.org
- Lynda: www.lynda.com
- New Media Consortium: www.nmc.org
- Spatial Perspectives on Analysis for Curriculum Enhancement: www.csiss.org/space
- Visible Earth, National Aeronautics and Space Administration: visibleearth.nasa.gov
- Visible Knowledge Project: crossroads.georgetown.edu/vkp
- YouTube: www.youtube.com