Toward a Visual Critical Electronic Literacy

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This essay suggests that teachers need to emphasize the visual dimensions of writing when texts are produced in electronic environments. As a sign system, all writing is both spatial and visual by nature.[1] Early hypertext writers celebrated the visual and experimental character of the new, nonlinear electronic writing environments.[2] Influenced by postmodern discourse and rhetorical theory, the hypertext theorists focused on the visual and the experimental character of electronic writing. And yet, while most of us who teach electronic composition agree on the importance of recognizing the visual dimensions of writing, we still don't fully comprehend the interconnected literacies required for electronic writing—including technological, verbal, textual, and visual. We also do not articulate to our students the fundamental importance of *visual design* in writing, especially when composing electronic texts.

Multimedia writing projects help students use traditional rhetorical techniques like invention, arrangement, and stance to develop ideas for particular audiences and purposes. Students in any discipline can learn important rhetorical processes by collaborating on professional-style interactive media projects for specific disciplinary audiences (Hocks and Bascelli). The information pathways and other interactive elements become deliberate choices made by the author and offered to the reader. As Gary Heba demonstrates in his essay "HyperRhetoric," the processes involved in this kind of multimedia design parallel rhetorical processes of invention, arrangement, and style typically taught in composition (37). In a multimedia environment the selection, the arrangement, and the movement of graphics, colors, texts and background all must work together to create a deliberate visual arrangement as well as a clear message. This attention to visual design is fundamental to effective electronic composition, especially when taught from a constructive theoretical framework.

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Scholarship in writing studies and communication has begun to focus on the design process as an integral part of text production. Gunter Kress explains how the context of intense social change creates this new emphasis on design:

> In the present technological context of electronic, multimodal, multimedia textual production, the task of text-makers is that of complex orchestration . . . . Design takes for granted competence in the use of resources, but beyond that it requires the orchestration and remaking of these resources in the service of frameworks and models that express the maker's intentions in shaping the social and cultural environment. While critique looks at the present through the means of past production, design shapes the future through deliberate deployment of representational resources in the designer's interest. (77)

Our students' lives are saturated daily by visual images and technologies that intermingle and replicate one another. Some of us have advocated that students learn to analyze computer culture by looking at computer-mediated communities, and have engaged in these critiques ourselves.[3] Clearly, students must learn both to critique technological culture *and* to design new media. To become critical thinkers and consumers of disciplinary and popular cultures, they can learn how to 'read' analytically and critique the saturated visual and technological landscape that surrounds them. This kind of visual literacy—critical attention to how images make meaning for particular people—is crucial for understanding the function and effect of any media. This definition of literacy also recontextualizes the function of writers as they become writers/designers of multimedia documents.

I argue in this essay that teachers of writing and teachers in the humanities in general must rethink the relationships among literacy, argument, and narrative forms within the context of visual electronic culture. In particular, when writing in multimedia environments is taught as a deliberate learning process, visual design becomes a crucial *rhetorical* process for students to engage in and develop. The changing notions of literacy required to produce effective multimedia documents redefine the function of writers, and the construction of narrative and argument in this fully visual medium. In other words, the production of multimedia has a profound impact on creating, understanding and communicating

knowledge that is at once visual and verbal. As Randy Bass suggests in the *College English* 1999 Symposium, new media impacts all academic disciplinary cultures, and we must become intimately involved in the design of media that furthers the goals and knowledge-making of our disciplines (668). For those of us who teach in electronic environments, our classrooms can become primary locations for examining new media forms and electronic design processes.

Our students are engaged in what James E. Porter calls internetworked writing—writing which involves the intertwining of production, interaction, and publication in the typical networked computer environment (12). The rhetorical context of this kind of networked electronic writing has shifted and become defined by the parameters of what Richard A. Lanham calls a "digital rhetoric," a rhetoric that at once combines verbal, visual, and traditional oral rhetorical forms "better than print" (30-31). Digital rhetoric, in this view, can actually liberate writers to experiment with form and even recapture the immediacy of oral traditions through improvisational spontenaity and the networked connection to audience. At the same time, some lament how the early excitement about digital communication has been eclipsed by the ubiquitous point-and-click interactive design of the World Wide Web (Joyce, "New Stories" 165). Most student writers currently in our classrooms are limited to interface-driven authoring systems in which they can only select from a prearranged and limited set of possible actions, such as clicking on the hypertextual links of most web browsers. Students need opportunities to experiment with the design of networked electronic environments. For example, students can learn to manipulate some of the diverse features of interactive visual media so as to increase the possibility of agency for the audience or reader. As students engage in internetworked writing, how can we further their understanding of the relationship between the medium and the message? More importantly, how do we encourage them to test the medium, to go beyond its current conventions? First, we need to explore how multimedia changes traditional definitions derived from print and oral literacy, and second, to investigate the rhetorical structures and classical divisions between narrative and expository form, by actually combining or even undoing these structures.

Visual Literacy and the Rhetorical Acts of Writers

Visual literacy becomes a crucial term and a heuristic when we try to identify the abilities needed to create successful electronic

documents. It has been argued that perception and visual symbolic interpretation are more universal than verbal language and thus will never have the logic or structure of verbal language. For example, in classic manifesto style, Donis A. Dondis argued in *A Primer of Visual Literacy* in 1973 that "visual literacy cannot ever be a clear-cut, logical system similar to language. Languages are made-up systems constructed by man [sic] to encode, store, and decode information. Therefore, their structure has a logic that visual literacy is unable to parallel" (12). In other words, visual symbols function differently from language structures and require a different kind of rigorous, intellectual learning of fundamental techniques. Proponents of visual literacy originally argued for a set of learned skills that would allow people to both make and understand visual messages independent from written literacy. On the more particular level, they offer standard guidelines. Designs are recommended to include strong, coherent structures that are kept simple, elegant, and use techniques like scale, contrast, symmetry, proportion, and so on, that adhere to accepted values of the relationships among visual elements.

Design professionals often use the analogy of writing, however, to describe the goals of graphic design: design is distinguished from fine arts by its "fitness to a particular user and task." It requires a "visual language" and a "vocabulary" of design elements. Design's elements require a "syntax" for how those elements fit together into an appropriate "*representation* best suited to the communication of some specific information" (Mullet and Sano 8-9). Visual design, these writers assert, is immediately representative, abstract, and interpretive, and thus enters the realm of the symbolic: "The communicability of any representation depends on a shared context between sender and receiver that allows signs to be interpreted" within a particular context (Mullet and Sano 188-89).

Visual and verbal literacy obviously become parallel processes when the goals of effective composition emphasize structuring and representing information for an audience. While they are structurally different systems, the semiotic functions of language and designed image become similar when they depend upon rhetorically constructed and situated contexts that include an understanding of, or identification with, intended audiences. Graphic design in this context does not adhere to universal standards, but is driven by audience and the particular problem to be solved: "Designs are never evaluated in absolute formal terms, but rather, succeed or fail on the basis of how well they solve a particular problem" (Mullet and Sano 25). In computer interface design,

modular division of the screen into units of information and functionality, and visual metaphors are absolutely essential to creating a successful electronic document that is a "coherent aesthetic experience" (Mullet and Sano 131). These values are determined by the conventions of successful and popular interfaces, and by what is anticipated to be accepted and understood by a particular audience. Usability studies help demonstrate the cognitive effects of interface design and the impact of visual patterns on the targeted audiences.

Writing and design activities, requiring visual and verbal literacy, are inextricably linked in all interactive media, where content translates automatically into structure, spatial arrangement, and action. Thus, interface design and data design in computer applications and online documents require writers to think about fundamentally visual, audience-driven principles. Domenic Stansberry points out in his guidelines for writers that designing content for new media focuses mostly on interactive design—the structure and flow of information pathways (17). Writers in professional interactive media projects typically get deeply involved in designing the information selection and flow, interactivity and the structure of the interface. These principles also have implications for mass communication and marketing techniques over electronic networks. For example, consistent icons and simple logos help create public images and corporate identities and thus convey visually the values and culture of the corporation (Mullet and Sano 145). Interactivity is not often researched in electronic composition, but it is an increasingly important part of all electronic writing. When designing interactivity, writers must decide what coherent experiences all users must encounter, and whether users will simply react, choose paths, or actually take control, alter the environment and become authors themselves. Given the increase in nonlinear electronic writing in the last ten years, definitions of literacy have become more inclusive of the visual and interactive elements of writing online. As Nancy Kaplan explains:

> In the past, literacy has chiefly meant alphabetic literacy. That meaning has dominated because the chief technologies of literacy, especially the early printing press, have privileged the written language over all other forms of semiosis.. . . . By literacy, then, I mean any act of semiosis that can be recorded outside of a human body and that can be recalled or conjured up later or for other use. Such a definition includes visual

> and (for want of better terminology) non-verbal or gestural or social literacies.

Multimedia deliberately designed as participatory, such as interactive fiction, CD-ROMs, and computer-based training, allow the possibility of bringing the audience into direct collaboration with the author or authors. Development and design can even be ongoing in a continual collaborative process, as with some World Wide Web sites that allow the users to create and add to the content. Most student writers, however, are currently limited to interface-driven, authoring systems in which they can select from a pre-arranged set of possible actions, such as the point-and-click hypertextual links of most web browsers. As Anne F. Wysocki demonstrates in her online essay "Monitoring Order," web pages inherit the conventions of book design, and both environments aim for a deceptive transparency. Even the text-based environments that writers find themselves using most frequently are incorporating more potential for scripted interactions and visual representations. Students need more opportunities to experiment with how networked electronic environments offer the possibility of agency to the audience, by creating and analyzing some of the interface designs and interactions possible in interactive media.

The concept of *critical* literacy can help focus our approach when we teach our students skills that help them enact situated knowledge that is contextualized, committed, and ethically grounded.As Wysocki and Johnson-Eilola explain, literacy is always a slippery and politically loaded term that represents too many things and is often used to fuel national public campaigns about educational standards. Rather than "a simple, neutral set of skills," literacy is often a false promise of social and political empowerment. (Wysocki and Johnson-Eilola 355). Building on the concept of critical literacy, Cynthia L. Selfe argues that all humanists need to teach students "critical technological literacy" that helps them in various institutional sites "to understand and to be able to assess—to pay attention to—the social, economic, and pedagogical implications of new communication technologies and technological initiatives that affect their lives" (432). As a fundamental part of critical technological literacy, visual literacy needs to teach students to understand critically how images create meaning and offer something to particular people in situated contexts.

Students have many demands on them as they create electronic documents, not the least of which is an extended audience that can include the far away reaches of a global communications network.

Needless to say, rhetorical choices about purpose, authority, evidence, and audience are complicated by choices about information design, interactivity, electronic communities, and the other contexts of electronic composition. Given that internetworked writing invariably involves writing, designing, and publishing activities within an ethical sphere of human connections, communicative acts are at once visual and verbal ethical activities. James Porter writes that "rhetoric is the art of constructing discourse—which includes figuring out what to say or write, where, when, how, and to whom. The 'to whom' part—a.k.a. the audience—makes rhetoric an art of human relations, and here is where we can see the point of overlap with ethics. . . . The concept that ties rhetoric and ethics together is *action*" (xiii-xiv). Like all rhetorical choices made while writing, these acts have consequences. To have a critical technological literacy, rhetorical ethics must become a central part of these activities. Because it is audience-driven, electronic writing should be grounded in what Porter calls critical rhetorical ethics: "ethics as situated praxis, as central to human relations, and as particularly sensitive to the role of rhetoric (and language) in determining ethical action" (144). He explains that in electronic composition," this critical rhetoric translates into an ethic of advocacy for one's electronic audiences—users, browsers, electronic readers—that aims to improve their conditions of learning and ease their conditions of oppression or dominance within institutional settings" (144-45).

Democratic participation in America today thus requires a combination of visual, verbal, and technological literacy that is also ethically grounded and aimed toward civic participation in our democracy. Scholars like Neil Postman worry that constant encounters with films, television shows, advertisements, CD-ROM games, and Internet sites might seduce students into being passive recipients of cultural values and visual images, and at the expense of written language. Instead of falling prey to Neo-Luddite fears, we want to help students become active analyzers and deliberate creators of these images and these media. Teaching students to analyze the visual culture they live in and consume is actually essential to critical thinking, active learning, and rhetorical skill when producing online work. We must also teach students to look critically at the cultural arrangements, meanings, and implications that are inherent in the media forms. We see all around us competing values and definitions of what makes a communications medium effective and purposeful—for some, like the CEO of Sun, Inc., it is creating seamlessly interactive electronic systems to

achieve transparent interactivity. For others, like Michael Joyce, it is in drawing attention to the structure and its limitations that learning takes place. He writes, "Technology aspires toward transparency. Insofar as that aspiration intends to hide its failings, technology, like any unaknowledged representation of power, endangers learning . . . . To each new task that technology accomplishes automatically, a spatializing pedagogy should append a step that maps its undoing, i.e. what is no longer seen and whom it affects" (*Of Two Minds* 65).

The visual mapping of a structure is one important way to keep us in a critical consciousness about technology. Joyce's argument points to the importance of recognizing that mediation and of working against the grain of the given technology. Similarly, Stephen A. Tyler suspects (and undercuts in his writing) the linear, argumentative plain style that hides or makes transparent the associative connections of ideas and privileges linear sequence (6). These writers simply underscore what postmodern theories of writing and rhetoric emphasize: the educational power and impact of undoing traditional conventions like the controlled linear "plain style" in favor of experimental forms of writing (Tyler 32-33; see also Bridwell-Bowles). As part of their education, we must teach students to question structures, and to ask whom a certain design benefits.

The Redefining of Forms

When we analyze multimedia artifacts, the representations of self and the stories told by images become more complicated than in traditional narrative or argumentative discourse. The understanding and use of conventions in multimedia design follows a pattern similar to that of narrative discourse: based on previous experience with narrative patterns, audiences expect similar or recognizably disjunctive (or defamilarized) experiences. Similarly, arguments created in this visual medium must be an arrangement of images based on evidence and conventional associations that have meaning for a particular group of people. In modern rhetorical theory, the forms of argument and narrative discourse are no longer considered distinct absolutes, but rather blur and intermingle in useful and interesting ways. Modern rhetorical and discourse theory demonstrates how all forms derive from a set of discipline-specific and historically situated audience expectations.[4] Like postmodern rhetoric, post-structural narrative theory destabilizes the idea of universal knowledge, by pointing to the constructs

of overarching master narratives that historically situate narrative.[5] With arguments defined as self-reflexive forms constructed in discourse, postmodern rhetoric emphasizes defining the contexts, power relations and other contingencies during a specific discursive moment—what James A. Berlin calls social-epistemic rhetoric. Forms and genres are generated as much from the rhetorical discursive contexts as from the medium itself. An argument, then, needs to have a situated context, an audience, some evidence, and an arrangement. Effective argument requires a committed, situated position with an ethical dimension, but it does not require an explicit linear structure. This idea of how conventions and form are situated in particular discourses and follow from audience expectations is not new, but it helps us to understand the conventions of new media writing and design, and to rethink appropriate forms for student writing in a fully visual electronic medium.

The forms of arrangement in new media will, appropriately, be different from traditional linear argument and narrative. Theorists have referred to new media forms as postmodern mosaics, embodied in structures like collages, which associate heterogeneous elements (Bolter and Grusin), as kaleidoscopes, which rearrange fragments moment by moment in various patterns (Murray), or as rhizomes, in which any point can connect to any other point (Moulthrop, "Rhizome and Resistance"). Consider the collage as a ubiquitous postmodern form in all forms of media, that is a means of understanding and arranging the nonlinear, decentered and fragmented postmodern world. Peter Elbow discusses the value of collage as a heuristic for writing, for thinking, for "making the mind jump." He writes, "Collages are built on the principle of association—the mind's gift for thinking of things that are *different* and yet *linked*" (37). In Elbow's view, effective arguments can take the form of nonlinear, postmodern collages with an implicit, associative structure. An exploratory argument as collage can even contradict itself. Jay David Bolter and Richard Grusin argue in *Remediation* that new media technologies are all collages that incorporate and combine older forms of media. For example, when the World Wide Web included graphics in 1993, it incorporated "the magazine, the newspaper, and graphic advertising," along with the graphic designers' "obsession with visual perfection" (198-99). The web soon integrated moving images and forms of television, radio, and other media, promising "greater immediacy . . . by recontextualizing them in the encompassing electronic environment of cyberspace" (200). Similarly, for Elbow the Internet and every home page is a collage (34). By incorporating other media and

combining them in surprising, yet recognizable structures, new media forms become more engaging for users, while also confirming what they expect and have learned from all contemporary forms of media.

In digital environments, we cannot avoid the blending of argument into narrative or vice-versa. Because interactive, computer-based documents are literally enacted over time, they are all journeys for the reader. This kind of interaction implies the same kind of control that all texts exert on readers. Reading practices have been described by response theorists as ongoing transactions between reader and writer where the reader fills in gaps left in the text to actually create the text.[6] The process of familiarity and disruption of conventions in new media follows a pattern similar to that of narrative discourse. Post-structuralist narrative theory demonstrates that, based on previous experience with narratives, audiences expect similar, as well as recognizably disjunctive, or defamilarized, experiences. Unlike traditional readers, however, the navigators of interactive texts follow the series of paths and structures to create actual versions through multiple readings of the text.[7] Multiple readings imply time as well as space, whether that time is figurative or literal, scripted or simply assumed. These interactions, in turn, create pleasurable experiences of immersion and agency for users. The experience of immersion, while the most satisfying form of narrative reading experience, remains in the author's control by virtue of the design.[8]

As an inherently expressive form, all narrative takes readers to the threshhold of an immersive trance. Digital narratives, then, have the potential to both affirm our expectations about narrative, and to enact that immersion, making users active participants in the narrative. Murray defines the principle aesthetics of digital narrative as immersion, agency and transformation. She argues that "the more realized the immersive environment, the more active we want to be within it"(126). Since the computer can embody and execute narrative processes, it can become a "participatory medium" and it "allows us to collaborate in the performance" (181). Immersion, then, is both familiar and strange: it is a quality of narrative experienced by readers, but its enactment in so-called immersive environments is unique to the digital medium. Immersive applications, seen most often in games and virtual reality, simply disrupt the standard interface conventions and employs a "hyperrealism" that adds to the enjoyment of the experience (Mullet and Sano 144). Bolter and Grusin describe immersive environments as having the quality of 'transparent immediacy,' for

example, the photorealism of digital graphics that transparently represent for us 'real' photography. They contrast this transparent medium to the hypermediated, self-consciously constructed medium by drawing on traditions like the collage and photomontage that call attention to interfaces, to media itself. The more hypermediated the medium, the more defamilarized the environment becomes, and this process of making the familiar strange, in fact, revitalized the media forms for users.

The instability of visual images themselves creates a central problem with designing electronic narratives and arguments. William J. Mitchell's *The Reconfigured Eye: Visual Truth in the Post-Photographic Era* outlines how image production has destabilized the trustworthiness of images, given that they can be manipulated, distorted and plagiarized with the tools of graphics software programs. Visual truth parallels verbal truth in that visual data constitute pieces of evidence in a knowledge-structure that is, itself, open to multiple interpretations of the data itself. Visual interpretations of data can be used to distort information and create a false narrative that persuades others unethically. Edward Tufte's *Visual Explanations*: *Images and Quantities, Evidence and Narrative* crystalizes this problem in the compelling case of the space shuttle Challenger's explosion due to failures of O-rings at cold temperatures:

> In the 13 charts prepared for making the decision to launch, there is a scandalous discrepancy between the intellectual tasks at hand and the images created to serve those tasks. As analytical graphics, the displays failed to reveal a risk that was in fact present. As presentation graphics, the displays failed to persuade government officials that a cold-weather launch might be dangerous. (45)

Tufte concludes that "visual representations of evidence should be governed by principles of reasoning about quantitative evidence. For information displays, design reasoning must correspond to scientific reasoning. Clear and precise seeing becomes as one with clear and precise thinking" (53). Similarly, designing and producing electronic media, especially when used as a deliberate learning process, has a profound impact on creating, understanding and communicating knowledge. When we get our students engaged in knowledge-making, we can show them the parallels and increasing interconnectedness between creating a visual truth,

a narrative truth, and an argumentative truth. Of course, without a clear sense of audience and purpose for the structure and presentation of information, this kind of knowledge-making remains an empty exercise. Since perceptions of audience drive the construction and form of argument, we cannot separate the complex interactions with audience from forms that are generated to meet those audiences' needs.

While rarely responsible for a completed interface or graphics design, a writer's rhetorical decisions will impact and interact intimately with the graphical design. Barbara Mirel has demonstrated how database design has become an essential part of communication in the workplace, so essential that it requires "a dynamic interplay between a writer's rhetorical and technological skills" that includes a "visual rhetoric" for effective data design (95). For example, the delivery of meaningful data requires both the ability to analyze readers' questions that help one discover the appropriate information, and to visually arrange that information so that it gives readers "ready access, appropriate emphasis, and perceptible groupings" (Mirel 102**).** Similarly, Tufte describes a successful computer interface as having a well-crafted parallelism and clustering of images, as well as clear differences on a screen that can help link together and also distinguish complex material, allowing for what he calls "visual reasoning" by the user. "In an architecture of content," he writes, "the *information becomes the interface*" (147). In Tufte's example interface for a museum, "a *flat interface* surfaces 45 options at once, distributing the information in space rather than in time" (146). He privileges content and information-rich visual designs over tedious hierarchical steps through the content and frowns upon screens where "the metaphor has become the interface," holding little substantive information but serving rather to decorate or hide content (148-49). When designing data structures in documents, the spatial arrangement of information, and the possible interactions with that information, writers require the accuracy and the logic of good visual *and* rhetorical analysis. Arguments and narratives created in a visual medium must both be based on accurate depictions of data and associations that have meaning for the targeted audience. Tufte and Mirel provide tangi ble evidence of designs that demonstrate the overlap between electronic composition and visual rhetorical design.

Conclusion

We can help our students explore what makes a multimedia design transparent or hypermediated for the people who use it by

having them begin to analyze and identify qualities like immersion, agency, and transformation in new media forms. So, for example, when students look at CD-ROM games or web sites, we can teach them to 'read' critically the infrastructure and the assumptions made about gender, age, nationality, or other identity categories. They can list what actions they can or cannot perform in a particular digital space, and how absorbed they (or their classmates) become when reading digital documents. They can look at hidden assumptions made by categories that appear on the screen and even assumptions made by the interface. We must then ask them to imagine, write, script, and sketch alternative realities, over space and over time, with a fully verbal and visual palette. Students need to use associative logic, categorical organization, and other forms of linkage as experimental structures. They can explore visual connotations, puns, and references to other media, perhaps as collages, and experiment also with visual manipulation and its effect on the text, on the screen, and on the reader. Multimedia design projects that move outside of web authoring and into other kinds of new media design—videos, databases, games, and so on—bring the visual squarely into the middle of the rhetorical contexts for writing. The selection of a metaphor and the categories used to organize visual information are interpretative functions of writers that have profound impact on how the information will be received and used. The value of multimedia design projects for students is that they can learn multiple modes of interpreting, arranging, and presenting information, and use those projects to develop abilities in good visual and rhetorical analysis.

Notes

[1] Various theoretical, historical and pedagogical studies of writing document the spatial and visual nature of writing technologies, e.g., Bolter, Lanham's "Digital Rhetoric" and *Electronic Word*, Hass and Kress.

[2] Jay Bolter defined electronic writing as "topographic writing," and the new writing technologies as "the visual writing space" (11). Stuart Moulthrop argued that hypertext was a new form of media and required a combination of both visual literacy and computer literacy ("Revolution"). Nancy Kaplan explained that " hypertextual writing systems [could] provide a graphic representation of textual structures, a dynamic map of the textual system in play" that "remain dynamic pictures of an evolving text." ("E-Literacies").

Michael Joyce stated it simply: "hypertext is, before anything else, a visual form (*Of Two Minds* 19).

[3] For example critiques of computer-mediated communities, see Baym and Hocks.

[4] See, for example, Barthes, Culler, and Perelman.

[5] See, for example, Jameson, Jauss, and White.

[6] See, for example, Rosenblatt and Iser.

[7] Stuart Moulthrop describes the impact of hypertext on the reader using post-structuralist theory in "Beyond the Electronic Book."

[8] This description of immersion and its relation to narrative is inspired by Janet Murray's *Hamlet on the Holodeck*.

Works Cited

Barthes, Roland. *Image-Music-Text*. Trans. Stephen Heath. New York: Hill and Wang, 1977.

Bass, Randy. "Story and Archive in the Twenty-First Century." *College English*. 61:6 (1999): 659-670.

Baym, N. "From Practice to Culture on Usenet." *The Cultures of Computing*. Ed. S. L. Star. Oxford: Basil Blackwell, 1995. 29-52.

Berlin, James A. Rhetorics, Poetics and Cultures: Refiguring College English Studies. Urbana, Illinois: NCTE, 1996.

Bolter, Jay David. Writing Space: The Computer, Hypertext and the History of Writing. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1991.

Bolter, Jay David and Richard Grusin. *Remediation: Understanding New Media*. Cambridge, Massachuestts: MIT P, 1999.

Bridwell-Bowles, Lillian. "Discourse and Diversity: Experimental Writing Within the Academy." *College Composition and Communication*. 43.3 (1992): 349-362.

Chilers, Pamela B., Eric Hobson, and Joan A. Mullin. *ARTiculating: Teaching Writing in a Visual World*. Portsmouth, New Hampshire: Hienemann, 1998.

Culler, Jonathan. "Prolegomena to a Theory of Reading." *The Reader in The Text: Essays on Audience and Interpretation*. Eds. Susan Suleiman and Inge Crosman. New Haven: Princeton UP, 1980. 46-66.

Dondis, Donis A. *A Primer of Visual Literacy*. Cambridge, Massachusetts: The MIT P, 1973.

Elbow, Peter. "Collage: Your Cheatin' Art." *Writing on the Edge*. 9.1(1998): 26-40.

Hass, Christina. *Writing Technology: Studies on the Materiality of Literacy*. Mahwah, New Jersey: Lawrence Earlbaum, 1996.

Heba, Gary. "HyperRhetoric: Multimedia, Literacy, and the Future of Composition." *Computers and Composition* 14 (1997): 19-44.

Hocks, Mary E. "Feminist Interventions in Electronic Environments." *Computers and Composition*. 16.1 (1999): 107-119.

Hocks, Mary E. and Daniele Bascelli. "Building a Multimedia Program Across the Curriculum." *Electronic Communication Across the Curriculum*. Eds. Richard A. Selfe, Donna Reiss, and Art Young. Urbana, Illinois: NCTE, 1998. 40-56.

Iser, Wolfgang. *The Act of Reading: A Theory of Aesthetic Response*. Baltimore: Johns Hopkins UP, 1978.

Jameson, Fredric. *Postmodernism, or, The Cultural Logic of Late Capitalism*. Durham, NC: Duke UP, 1991.

Jauss, Hans Robert. *Toward an Aesthetic of Reception*. Trans. Timothy Bahti. Minneapolis: U of Minnesota P, 1982.

Joyce, Michael. *Of Two Minds: Hypertext Pedagogy and Poetics*. Ann Arbor: U of Michigan P, 1995.

—-. "New Stories for New Readers: Contour, Coherence and Constructive Hypertext." *Page to Screen: Taking Literacy into the Electronic Era*. London: Routledge, 1998. 163-182.

Kaplan, Nancy. "E-Literacies: Politexts, Hypertexts, and Other Cultural Formations in the Late Age of Print." <http://raven.ubalt.edu/staff/Kaplan/lit/One_Beginning_417html >.

Kress, Gunther. "Visual and Verbal Modes of Representation in Electronically Mediated Communication: the Potentials of New Forms of Text." *Page to Screen: Taking Literacy into the Electronic Era*. Ed. Ilana Snyder. New York: Routledge, 1999. 53-79.

Lanham, Richard A. "Digital Rhetoric: Theory, Practice, and Property." *Literacy Online: The Promise (and Peril) of Reading and Writing With a Computer*. Ed. Myron C. Tuman. Pittsburgh: U of Pittsburgh P, 1992.

Mirel, Barbara. "Writing and Database Technology: Extending the Definition of Writing in the Workplace." *Electronic Literacies in the Workplace: Technologies of Writing*. Eds. Patricia Sullivan and Jennie Dautermann. Urbana, Illinois: NCTE, 1996. 91-114.

Mitchell, William J. *The Reconfigured Eye: Visual Truth in the Post-Photographic Era*. Cambridge, Massachusetts: The MIT P, 1992.

Moulthrop, Stuart. "You Say You Want a Revolution? Hypertext and the Laws of Media." *Postmodern Culture* 1.3 (1991). <http://www.iath.virginia.edu/pmc/text-only/issue.591/moulthro.591>.

—-. "Rhizome and Resistance: Hypertext and the Dreams of a New Culture." Hyper Text Theory. Ed. George P. London. Baltimore: Johns Hopkins UP, 1994. 299-322.

—-. "Beyond the Electronic Book: A Critique of Hypertext Rhetoric." *Hypertext '91 Proceedings*. Milan: The Association for Computing Machinery, 1991. 291-99.

Mullet, Kevin and Darrell Sano. *Designing Visual Interfaces: Communication Oriented Techniques*. Mountain View, California: Sun Microsystems, 1995.

Murray, Janet H. *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Cambridge, Massachusetts: MIT P, 1997.

Perelman, Chaim. *The Realm of Rhetoric*. Trans. William Kluback. Notre Dame, Indiana: U of Notre Dame P, 1982.

Porter, James E. *Rhetorical Ethics and Internetworked Writing. New Directions in Computers and Composition Studies*. Eds. Gail E. Hawisher and Cynthia Selfe. Greenwich, Connecticut: Ablex, 1998.

Postman, Neil. *Technopoly: The Surrender of Culture to Technology*. New York: Knopf, 1992.

Rosenblatt, Louise M. *The Reader, The Text, The Poem: The Transactional Theory of The Literary Work*. Carbondale: Southern Illinois UP, 1978.

Selfe, Cynthia L. "Technology and Literacy: A Story About the Perils of Not Paying Attention." *College Composition and Communication*. 50.3 (1999): 411-436.

Stansberry, Domenic. *Labyrinths: The Art of Interactive Writing and Design*. Belmont, CA: Wadsworth Publishing Company, 1998.

Tyler, Stephen A. *The Unspeakable: Discourse, Dialogue, and Rhetoric in the Postmodern World*. Madison, Wisconsin: The U of Wisconsin P, 1987.

Tufte, Edward. *Visual Explanations: Images and Quantities, Evidence and Narrative*. Cheshire, Connecticut: Graphics P, 1997.

White, Hayden. *Tropics of Discourse*. Baltimore: Johns Hopkins UP, 1978.

Wysocki, Anne Frances. "Monitoring Order: Visual Desire, the Organization of Web Pages, and Teaching the Rules of Design." Kairos. 3.2 (1998). <http://english.ttu.edu/kairos/3.2/features/wysocki/bridge.html>.

Wysocki, Anne Frances and Johndan Johnson-Eliola. "Blinded by the Letter: Why Are We Using Literacy as a Metaphor for Everything Else?" *Passions, Pedagogies and 21st Century Technologies*. Eds. Gail E. Hawisher and Cynthia L. Selfe. Logon, Utah: Utah State UP, 1999. 349-368.