

Writing Space by Degrees: Conversations with Jay David Bolter and Anne Balsamo

Jay David Bolter and Anne Balsamo both serve as graduate faculty in Georgia Tech's School of Literature, Communication, and Culture. Professor Bolter's work focuses on computers and writing, multimedia, hypertext, and rhetorical theory; he is, perhaps, best known nationally for his book Writing Space: The Computer, Hypertext, and the History of Writing. Professor Balsamo is Graduate Director of the new Master of Science Program in Information Design and Technology at Georgia Tech; her work centers on feminist cultural studies; media studies; and social, institutional, and cultural topics in communication. Professor Balsamo's Technologies of the Gendered Body: Reading Cyborg Women has recently been published by Duke University Press. Our first conversation is with Professor Bolter and our second is with Professor Balsamo—Eds.

Part One: Jay David Bolter

The Editors: Your personal Web page mentions the Graphics, Visualization, and Usability Center [GVU]? What is that center?

Jay Bolter: The GVU is an interdisciplinary center here at Georgia Tech. Its aim is to make computer interfaces more useful as well as more usable: the particular emphasis is on scientific visualization, information visualization, three-dimensional graphics and animation, and virtual reality. It's an interdisciplinary effort that brings together people from various branches of computing, psychology, industrial design, and rhetoric and communications. I work with colleagues in the GVU from several fields. My concern is with the computer as a tool for

effective verbal and visual representation and communication. That interest comes from my background in the humanities.

The Editors: How does a nice Classics professor like yourself get mixed up in computer science?

Jay Bolter: While I was getting my graduate degree in Classics, I also took courses in the Computer Science Department at the University of North Carolina. At that time, in the late 1970s, I thought of the computer principally as a research tool—for example, as a tool for philological research in Greek and Latin literature. We had then a minicomputer that contained a database of Greek authors. This machine allowed classicists to study the use of words and phrases in context. In time I passed beyond these philological uses to a more general concern with the impact of the computer on the humanities and on the ways in which our culture reads and writes. Gradually, I suspended my work in traditional classics and eventually produced two books, *Turing's Man: Western Culture in the Computer Age* [Chapel Hill: U of North Carolina P, 1984] and *Writing Space* [Hillsdale, NJ: Lawrence Erlbaum, 1991].

The Editors: If you were composing *Writing Space* today or coming out with a second edition, would your views be different in any way than when the book came out in 1991? In the past five years, many developments have taken place in computer hardware, software, and applications, and, of course, you yourself have had much more experience with computers.

Jay Bolter: Two important developments in computing weren't clear to me when I wrote that book. I was thinking of the computer as a writing technology in the context of the papyrus roll, the manuscript, and the printed book, and my paradigm for computer writing was hypertext. I understood hypertext as verbal hypertext; I did not give adequate consideration to computer graphics. Computer graphics has been around for a long time; indeed, the first computer graphics program was written in the early 1960s. But it wasn't until the 1980s that computer graphics became

widely available. Only recently have desktop computers become powerful enough to generate high-quality static graphics and animation. At the same time we have also witnessed a continuing growth in the importance of graphics technology in the entertainment industry. Each new Disney film, viewed by millions of people, seems to mark a new stage in the transition from traditional animation to computer-controlled animation. We can now speak of a graphics revolution that has altered our notions of what computers are and what they do. I did devote some small space to computer graphics in *Writing Space*, but my coverage certainly wasn't adequate.

I am trying now to integrate computer graphics into my analysis of the history of writing. In my book I argued that electronic technology sends us back to reexamine earlier technologies of writing. We understand the medieval codex and the printing press differently now that we write with computers. By the same token, I would argue that computer graphics can change our understanding of earlier technologies of the image, such as perspective painting, photography, film, and video. Computer graphics reawaken our culture's interest in some very old questions about the relationship between word and image—or more generally between symbolic representation and perceptual representation in various media. We need to understand how these two modes (the symbolic and the perceptual) cooperate and compete in current manifestations of hypertext and computer graphics.

Another area that I did not address adequately in *Writing Space* was, of course, networking. The Internet has also existed for over a decade—or even since about 1970 depending upon your definition of the Internet. But it's only in the past few years that the Internet has become part of the fabric of cultural communication. It's only in the past few years that the World Wide Web has made hypertext a global phenomenon—made it possible to link texts and images that reside on computers separated by continents. Global hypertext is something I regarded only as a utopian, or at least a highly futuristic, vision. But now it is a reality.

The Editors: Since many of our readers are teachers of writing in one way or another, what advice you would offer them in order to deal with what you call “the revolutionary and evolutionary” changes in our writing space?

Jay Bolter: As I've just said, five years ago, I didn't realize the importance of graphics in electronic communication. It seems to me now that the integration of text and graphics in electronic environments poses enormous questions for the teaching of writing. We cannot continue to ignore the need to combine images and words in a new kind of rhetoric. And yet most of us come out of traditions of rhetoric and communication in which writing is almost exclusively verbal.

The Editors: As a writing teacher, how are you preparing yourself to teach your students about integrating text and graphics?

Jay Bolter: First, I'm trying to learn more about graphics myself. As I have suggested, my strategy for understanding new technologies is to try to situate them historically. So I'm looking back at the development of perspective painting, photography, film, and video. I want to see how these techniques for presenting images complemented and competed with the contemporary technology for reproducing words, namely the printing press.

Then on a practical level, I'm asking my students to incorporate images into their texts. Like many other teachers now, I am asking students to create Web sites using HTML. When you ask students to use HTML, it is inevitable that they will want to insert images, and in some cases, video into their pages. They have models for these eclectic texts throughout the World Wide Web, where the relationship of word to image is immediately foregrounded for them. If we as teachers encourage our students to write hypertextually and with multiple media on the Web, we will need to find criteria by which to judge what the students create and to help them improve. We can certainly draw on our own rhetorical training with writing for print, but we will also need to learn from other traditions, such as graphic design and video production.

The Editors: So do you, perhaps, see a new discipline growing out of the combination of print literacy and visual literacy?

Jay Bolter: I don't know whether there will be a new formal discipline, but I see a need for new collaborations among existing disciplines. The new fact of computer communication poses a problem for the university structure. We have several established disciplines, none of which deals fully and exclusively with the phenomenon. Instead, people from various disciplines and intellectual traditions bring to this new medium the knowledge and practices they have acquired in those disciplines. My colleagues here in the School of Literature, Communication, and Culture come from a humanities background with training in rhetoric and literary theory, and they bring those perspectives to electronic writing. Professors in our College of Computing bring, of course, a knowledge of computer science and a tendency to think in operational and computational terms, but many of these computer scientists also realize that the Internet has become a general arena for cultural communication. Some schools of graphic design—I'm thinking in particular of the University of Baltimore—are now retooling their programs to give their students training in the World Wide Web; these schools apply visual aesthetic criteria to Web design. Departments of public policy, economics, and management also want to study the Web. How these competing claims will be settled institutionally is unclear to me, and it may well be that different universities reach different solutions. In some way or other, disciplines as different as computer science, psychology, English and writing pedagogy, graphic design, film and video production, and so on—all these disciplines are going to speak to and through this new medium.

The Editors: Frequently these days we writing teachers hear the terms hypertext and hypermedia tossed around. Are hypertext and hypermedia new genres or just another tool or disciplinary convention that one has to learn? Carol Berkenkotter and Thomas N. Huckin [*Written Communication* 10 [1993]: 475-509], for example, define genre in this way:

Genres are the media through which scholars and scientists communicate with their peers. Because genres are intimately linked to a discipline's methodology, they package information in ways that conform to a discipline's norms, values, and ideology. Understanding the genres of written communication in one's field is therefore essential to professional success. (476)

Jay Bolter: I think I would prefer another term. Instead of "genre" I would say "discourse" or "rhetoric." And I would say that hypertext and hypermedia do not constitute a single rhetoric. Instead, hypertext and electronic communication in general support a variety of different rhetorics or discourses. To get an idea of the range of possibilities, take on the one hand Michael Joyce's fictional hypertext afternoon and on the other a Web site by a major corporation. These two hypertexts are rhetorically worlds apart, yet both use the hypertextual paradigm of elements and links. Now, I have argued that electronic writing does foster certain kinds of discourse and make other kinds of discourse less plausible. Still it seems to me that electronic communication itself is polyvocal, able to contain many different and potentially conflicting rhetorics.

The Editors: Two futuristic waves that many writers are experiencing are the greening of the humanities, a topic which seems to be getting a good deal of recent air time and print space, and virtual reality in the context of cyberspace and hypertextual linking. Do you foresee at least the possibility of an ecologically and technologically contiguous writing space, one in which green electronics, if you will, somehow brings together E. O. Wilson's "naturalist's trance" and electronic consciousness in a virtual space?

Wilson argues that humans in modern technological society have lost a kind of consciousness that certain hunter-gatherer peoples had. An example of Wilson's "naturalist's trance" might be that consciousness that occurs, for example, when someone is birdwatching and hears the sound of the bee, the snap of the twig, and the smell of water. A thousand years ago that sort of sign might have determined whether you lived to see the morning. A contrasting reality might be virtual reality. However, an

example that unites these two realities comes to mind from a science fiction image from about twenty years ago: a man is sitting under a tree while computers spin around him like flowers in a field. It was a beautiful image, one that integrated computers and technology with an ecological vision. Do you think that there will ever be this ecological and technological contiguity? Is there a place in our future where Darwin's web of life and the World Wide Web articulate? Are these two waves ever going to be in phase or are they permanently out of phase?

Jay Bolter: Until you posed the question, it would not have occurred to me that they could be in phase. There would seem to me to be a gulf between the discourse of ecology and that of electronic technology. The computer itself creates a highly technological, highly artificial environment that doesn't seem to have much in common with the naturalist's world. If Darwin's web of life and the World Wide Web do come together, the point of contact might be through the continuing development of the computer as a graphics and sound machine—a perceptual environment as evidenced in virtual reality. Virtual worlds could become more realistic, more effective at creating illusions, so that the user can see and hear the twig snap, the bee buzz, and so on. I'm skeptical, though, that virtual reality can achieve that level of detail. It seems to me that virtual environments are very thin perceptually in comparison with the thick experience that we call the real world. I don't see the trajectory by which current technology would approach the richness of the naturalist's environment. Nor do I necessarily think that it would be a good idea to follow that trajectory. I don't think that electronic technology needs to encompass the whole of human experience.

The Editors: Have you read Robert Markley's introductory article to *Configurations* ["Shreds and Patches: The Morphogenesis of Cyberspace," *Configurations* 3 (1994): 433-39]?

Jay Bolter: I haven't read that particular article, but I know and admire Markley's work.

The Editors: He talks about how there may be a kind of masking in virtual reality, about the symbolic space and symbols that are created, the idea that we can skirt around scarce resources, that we can escape into cyberspace, into virtual reality, as opposed to dealing squarely with such things as resource limitations.

Jay Bolter: I certainly agree that enthusiasts for virtual reality use an escapist rhetoric. I think their rhetoric often misrepresents VR technology. Then there is the question whether escape into virtual reality would be a good idea, even if it were possible.

The Editors: On page 110 of *Writing Space*, you make a comparison between orally delivered text and written exposition: You state that it is only in written text that the flaws and the argument can be seen. Your view appears similar to Walter Ong's. Then you maintain that hypertexts are like Homeric oral texts in that the audience directly influences the direction the text takes. Isn't there thus a danger in our times of text being created by a mob mentality in a kind of unreflective, frenetic culture of Net users? In Kevin Robb's recent book on literacy in Ancient Greece [*Literacy and Paideia in Ancient Greece* (New York: Oxford UP, 1994)], he suggests that in books 2 and 3 of *The Republic* that Plato is attempting to wrest education away from Homer and the kind of uncritical problem-solving based upon custom and specious analogy that comes from education in Homeric texts. In your view, is hypertext then educational progress or is it educational decay to a kind of pre-Platonic time where people throw in their little interjections and that's the direction the text will take?

Jay Bolter: I did draw an analogy between one aspect of hypertext and Homeric oral poetry: Both have a kind of immediacy in which the audience can influence the direction that the narrative takes. But that analogy doesn't mean that I would commit myself to a complete assimilation of hypertext and oral poetry or oral culture. I have tried to argue in my book that there are historical resonances between electronic writing and almost all the previous technologies of writing. There are ways in which electronic writing is like the printed book, ways in which it is like

the medieval codex, and ways in which it is like oral communication. There are ways in which it differs from all these earlier forms. So I am not committed to arguing that the immediacy of hypertext means that it necessarily fosters unreflective discourse.

Let's look at the existing hypertexts: for example, the stand-alone hypertexts that predate the World Wide Web. There are not many of these, but the ones that do exist (such as the Eastgate hypertextual fictions) are often sophisticated, extremely literate productions. They show that hypertext does not necessarily lead to the unreflective thinking that Plato apparently feared in oral poetry (which he didn't know was oral poetry, anyway). I do agree that in the whole constellation of electronic communication there is a great deal of unreflective discourse. That is not surprising. Our criteria for judging the sophistication of discourse comes out of our long experience with printed texts, and print is a medium that encourages precise analysis and expression. It is true that you find unsophisticated and imprecise discourse on the Internet—particularly in e-mail. You also find many sites on the World Wide Web with flashy graphics and very little substance. But I'm not alarmed at the changes that electronic writing is making in our culture's discourse. Whenever you have a reconfiguration of media like the one that we're experiencing now, the results are going to be mixed, especially when judged from the perspective of an older medium.

The Editors: You note that "navigating through the electronic writing space will place new demands upon human mental capacity and imply a new definition of memory itself" [*Writing Space* 57]. Can you forecast what you see as these new demands on readers or writers?

Jay Bolter: The new demands are very well illustrated by the World Wide Web, in which we often have difficulty finding things or getting back to things that we have previously found. It's not that it was necessarily easier to find our intellectual way around a large printed library. Over the centuries, we have developed a sense of the structures of print technology and how to use them. In electronic writing space we now need to be more conscious of

the process of navigation because the medium is unfamiliar and organizational structures have not yet been perfected. The World Wide Web certainly puts new demands on our memories in the literal sense that we have to remember the URL of a Web site in order to revisit it.

As writers we now need to learn how to structure our hypertextual or hypermedia documents so that readers can navigate to and through them. We can no longer predict the exact order in which our verbal and visual expressions will be presented to a reader, and so we have to entertain a multiplicity in our documents that was not required or even easily possible in print. In the 1980s, a few of our colleagues in the humanities were talking about navigation and linking—I'm thinking of Michael Joyce, George Landow, Stuart Moulthrop, Nancy Kaplan, and others. But with the growth of interest in the World Wide Web, a much larger group of teachers and writers is having to confront these issues.

The Editors: I have a follow-up question to one we asked earlier. Many of us who teach writing believe that the three most important words in composition are audience, audience, audience. Relating to audience, you assert, for example, that "an electronic encyclopedia may address both the educated novice and the expert" [*Writing Space* 7]. Given that meeting the needs of a particular audience involves more than the selection of an appropriate level of vocabulary, how can a particular electronic text—even hypertext—serve a widely disparate audience, such as novice and expert?

Jay Bolter: Writing hypertext for multiple audiences is easy to theorize about and difficult to do well. Theoretically, a text can present different pages or elements to different readers. It can allow readers to pursue topics superficially or in depth, depending upon their level of expertise and their interest. Hypertext makes such multiple organizations far easier than it was in print. An electronic encyclopedia could begin with a layperson's discussion of relativity, and yet its links could take a more sophisticated reader all the way down to Einstein's original journal articles. On the other hand, when you look at actual Web sites, which are our

most prevalent examples of hypertext, it turns out to be hard to organize a hypertext to speak to radically different audiences. One reason may be that we haven't yet discovered effective rhetorical strategies for the new medium. I believe that with the right rhetoric we can refine our ability to speak to multiple audiences through hypertext.

The Editors: We're just not there yet, are we?

Jay Bolter: No.

The Editors: What troubled James Fenimore Cooper's Natty Bumppo—the archetypal natural American man—about the written word (see *Last of the Mohicans*) was that it distanced the writer from the reader, thus making dodging one's responsibility for one's words all that easier. Will writing in electronic space help solve Natty's problem, exacerbate it, or is this not even an issue within the technological paradigm?

Jay Bolter: It's certainly an issue. Yet what troubled Natty Bumppo is exactly what Walter Ong thinks is the great virtue of writing—that it does allow for the separation of writer and reader. A writer's words can be distributed to a number of readers across time and space. But with this increased ability to communicate over a distance comes a concomitant loss of the senses of context and responsibility. A loss of context is perhaps intrinsic to any technology of writing, and I don't see that electronic technology can fully redress the problem. I might add, though, that different technologies define different relationships between writer and reader with a greater or lesser feeling of immediacy. So, for example, electronic mail or, even better, Internet chat groups allow writers and readers to connect more immediately than they can with printed text. And interactive video over the Internet constitutes a different form of communication with an obvious sense in immediacy—a form that bypasses writing altogether. With regard to immediacy, then, electronic environments combine some features that are perhaps inherent in all writing with other features, such as e-mail, that are particular to this new medium.

The Editors: Walter Ong and David Olson maintain that the linear aspect of writing led to some rules for thinking—a kind of linear way of thinking—modeled, for example, in the nineteenth-century formal essay. If the formal essay defines a reasonable way of putting thoughts together to deduct hypotheses or whatever, do you think that hypertext, without the formal essay's linear forms, is going to lead to a different way of thinking? Is hypertext going to have some cognitive effects on us as a culture?

Jay Bolter: I would be very careful about trying to make a claim that great for hypertext. Walter Ong's claims about writing itself have been challenged by anthropologists who maintain that people in primary oral cultures were capable of the kind of logical reasoning that Ong contends can only happen after the introduction of writing. So I would be unwilling to claim that hypertext changes the way we think. Instead I would say this. Cognitive abilities are not necessarily changed by the introduction of writing; what changes is the way we conceive of ourselves and our cognitive abilities. Even if the introduction of writing doesn't make us smarter—which is in any case a superficial reading of Ong—still writing can give us a new sense of identity, a new sense of self. To a lesser degree, perhaps, a change from the linear technology of print to hypertext may foster a new sense of individual and cultural identity. I don't wish to be labeled a technological determinist by suggesting that the introduction of electronic writing alone can have that effect on our culture. Electronic technology fits in with a series of changes, ratified by poststructural and postmodern rhetoric about cultural identity and the nature of the self.

The Editors: Is a hypertextual Walden online likely to lead anyone to ask what might be the really difficult questions about one's own relationship to that text and more importantly to the ecological community of which the reader-writer is a part? More likely than just reading Walden under a tree or something like that?

Jay Bolter: More likely perhaps because the text becomes interactive in a new way. With a hypertext you do engage with

the text at an operational level. Even with a simple World Wide Web page, you have to point and click in order to move; you have to make an operational decision about where to go next. Readers who engage with a text are more likely to conceive of the text not as a remote and fixed entity, but as a process in which they can participate. If that's true, then electronic text may foster a more critical and responsible kind of reading.

The Editors: As opposed to a traditional book that may foster a spectator-spectacle view of the world? By participating hypertextually, you bring about the participant-observer sense. And that's in the technology, that tendency?

Jay Bolter: Yes. I think so. That's not to say that there are no participatory readers of printed texts. It may just be a question of degree, so that readers of hypertext are somewhat more inclined to be critical and active.

The Editors: Underneath the text in any hypertext is a computer program and that program is on-off or binary. Ultimately, isn't that about as linear as you can get?

Jay Bolter: I don't think that it matters that the computer program itself is linear. The user need not know or care what the program is doing behind the scenes; what matters is what the text is doing before his or her eyes. The program could be implemented in a variety of ways on a linear machine or conceivably on multiprocessors. The important thing is how the reader interacts with the textual structure. A hypertext remains hypertextual, despite the fact that it may be running on a von Neumann computer

Part Two: Anne Balsamo

The Editors: Please tell us something about the Master of Science Program in Information Design and Technology at Georgia Tech.

Anne Balsamo: In 1989, the Georgia Institute of Technology began a massive reorganization project. One of the consequences of the Institute's reorganization was the transformation of the Department of English into the School of Literature, Communication, and Culture. Part of the arrangements for the school included the development of two programs of study: one at the undergraduate level and another at the graduate level. Prior to this, the former department of English had never had a major program. The faculty in the school constructed an undergraduate, interdisciplinary major in "Science, Technology and Culture." This program went on the books officially in 1990. The next program designed by the faculty was the M.S. program in "Information Design and Technology" [IDT].

Early on, the M.S. program was designed as a straightforward technical communication program that didn't have a strong technical component. But as the faculty involved reworked it, the technical writing emphasis gave way to a different emphasis on information technologies and professional communication. What we have now is a graduate program that is based on new media that draws on work in media studies, communication studies, and pedagogical studies of the use of electronic environments. The M.S. program went on the books in 1993. The first group of students was admitted in the Fall of 1993.

The Editors: Are your graduate students from many different disciplines then?

Anne Balsamo: We have a wonderful mix of students, not only in terms of their academic backgrounds, but also in terms of their ages, interests, and professional accomplishments. We have a few traditional students fresh from undergraduate programs in English, and a few with M.A.s in literary studies. But we also have students coming out of programs in engineering, architecture, and sciences. We have several mid-range students who have been out of school for 3-5 years who have worked in advertising or as professional communicators, technical writers, and graphic designers. Some of our students are older ones who are beginning a second career in electronic communication fields.

The Editors: Speaking of electricity, I would imagine then that there's quite a bit of it among the students. Do you feel that there's a sort of creative

Anne Balsamo: Yes, that's one of the things that we really stress in the application process: what mix of interests a prospective student brings to the group. Because our students often work in small teams on design projects, they need a diverse range of skills to draw on. They need people who have technical skills who can serve as peer-teachers for one another. These peer-teachers are especially helpful in the long night hours spent in the lab when no faculty member is available. Strong writing skills and creative writing are equally important qualities in student team members. As is having people who have a graphics, art, or architecture background.

The Editors: What is the GRE level of your prospective students? In the 97-98th percentile?

Anne Balsamo: This is the first year that we've required GREs of all the applicants. I don't know yet what the average GRE score is for our students. Georgia Tech students, in general, usually score quite high.

The Editors: How about the number of students that apply to the master's program as contrasted with the number that you accept?

Anne Balsamo: We have about 70 applicants per year and we will admit 25 of those to fill a class of 20.

The Editors: We would like to know a little something about you and your training. Would you tell us about your background, and how it is that you wound up at Georgia Tech, involved with this School and this program?

Anne Balsamo: I have a Ph.D. in mass communications from the University of Illinois at Champaign-Urbana. The degree was granted by the Institute for Communications Research—one of the oldest communications institutes in the country. Although I don't have an English Studies Ph.D., I did support myself through graduate school by teaching film and women in literature courses for two English departments, first at University of Illinois and then at Illinois State University. All of my teaching experience prior to coming to Georgia Tech had been in English Departments. My broad area of research is feminist cultural studies of science and technology.

More recently, I've been focusing on new communication technologies. I just had a book published called *Technologies of the Gendered Body: Reading Cyborg Women* [Durham, NC: Duke UP, 1996], which is a study of the various new body technologies that emerged during the last decade to great media fanfare: female bodybuilding, new reproductive technologies, virtual reality, and computer-mediated communication. *Technologies* is an interdisciplinary project that draws on my interdisciplinary training in cultural studies. It's informed by literary studies, sociology, anthropology, and medical science.

My interdisciplinary training and research experience seemed to provide a good background for the IDT program. I took over as director of graduate studies in March, 1995 from Peter McGuire, the visionary who set the program in place originally. My aim is to augment the interdisciplinary nature of the graduate program and to move it into the next phase of its development.

The Editors: A recently published criticism of virtual space and environments speaks of these places as masculinist in their very design and mentions the resistance to cyberspace by, among others, proportionately more women and African Americans than white males. Does this resistance represent ideas of community, say ecological or sociological, that are antithetical to electronic networks, or is this resistance the result of oppression and, therefore, in need of remedying?

Anne Balsamo: A wonderful thing about electronic environments is that they are very protean kinds of social spaces. They change

rapidly. In one of my book chapters, I offer a review (and critique) of some of the conversational and interactive norms I witnessed while lurking on various electronic discussion lists. The critique was based on an analysis of the demographics of users for this particular list, and on the conversational norms that prevailed. At the point of my lurking, the norms seemed to be thoroughly gendered. I'm not so sure that this is still the prevailing form of conversation now that more women are on-line and participating in discussion lists on various topics. More recent research describes, and indeed, more recent interactions on the Net, suggest that these electronic spaces are populated by people playing all kinds of roles and staging all kinds of identities. It's getting really hard to tell what the gendered embodiment is of the people participating in electronic discussions. So I think it's difficult to make grand generalizations about this new form of social space as entirely masculinist, or entirely resistant. It seems much more protean than that.

The Editors: And that situation would be for those who are already part of the electronic environment? But how do you understand the resistance, the fact that proportionately many more African Americans, for example, have expressed lack of interest or concern? A recent *Newsweek* article discusses this lack of involvement. For those who are in that space, maybe it is a more horizontal sort of place. However, viewing electronic environments through the lens of the green movement might suggest that those who are actively uninvolved in the electronic environments are resistance fighters, because there is something inherently unecological about such environments.

Anne Balsamo: My inter-texts here are not ecological, but rather ones from the discourse of body. The virtual communities that get constructed are disembodied—radically disembodied communities that prohibit or even evacuate the notion of community in a certain way. They are communities of people who can't really "be" there for one another except virtually. It's unclear how one's resources can be offered to the common good in the way they are when one shares living space with other people in a bounded geographic location. I think of the issue you posed in

the following way: What are the consequences of reformulating our experiences with community through electronic means? I would argue that bodies are important, as is a sense of shared geographic location, for a true sense of community to develop.

Editor John Coletta: Those are excellent questions, but I can't help but notice in my experience in the academic world how many academics, especially at the research institutions, seem to be disconnected from the local communities and the region, as well as from ecological communities. I went to the University of Oregon to do my doctoral work specifically because the school was near the mountains and the ocean; virtually all the faculty whom I knew huddled close to the university and didn't know anything about the region biologically or about the people who lived there. This observation is nothing new. However, the ivory tower's disembodied relationship to the community bothered me, and now in learning more about electronic environments, it seems to me that some of that resistance by African Americans and women is a kind of statement that "Wait a minute; have we thought out fully the implications of electronic environments? Aren't these an appropriation?" Certainly zoologists or ecologists, for example, wouldn't define environment in the way in which I am here.

Anne Balsamo: There are several reasons why academics don't get invested in their local "geographic" communities. One is that we don't have very much control over where we live. Given the bad job market in English studies in recent years, people are taking jobs in places that they would never have dreamed of living. There is probably some resentment or at the very least some acclimation that needs to be worked out. That takes time. This lack of control seems to be very different for academics than for other professionals. Another reason is tied to the tenure clock and what seems like a prolonged postponement of permanency. Graduate school is obviously temporary. But recently the normal career trajectory for new Ph.Ds includes a short stint in an adjunct position, another temporary living arrangement. Once the tenure-track position materializes, it's another 5-6 years of temporariness until tenure is awarded or refused. It's a protracted

period of instability. As a consequence, investment in a local community is often neglected.

In response to your second question, I don't know what African Americans think about virtual environments. I have different groups of friends who have different kinds of experiences with virtual life. I can give you two anecdotes about how gender, race, and class are complexly influential on people's responses to electronic environments. The first concerns our location in Atlanta—which is home to a significant number of historically black colleges. One of my good friends and colleagues, Mary Hocks, is the director of the comprehensive writing program at Spelman College, which is a very good, selective women's college. Mary just received a \$400,000 Mellon grant to develop multimedia training programs for the faculty so that they can, in turn, develop multimedia materials for their courses. The first course they are going to focus on is the African Diaspora course that is required of all Spelman students. Spelman's administration is committed to supporting multimedia development and making multimedia and computer-writing classrooms available for their students.

A second anecdote concerns our recent trip to China. My colleague Donna Llewellyn, a professor of engineering here at Tech, and I took a delegation of women students to the UN conference and NGO Forum held in Beijing in August-September of 1995. We also took with us a multimedia exhibition called "Women of the World Talk Back" that we built specifically for the Forum. Part of our exhibit involved asking participants to "talk back" to various heads of state about the issues that concern women in different countries. We met women and men from all over the world who were eager and interested in the possibilities of new media. For example, a Tanzanian television producer was interested in multimedia because it involves a different level of literacy that she felt makes it easier to train people. Her interest in our project was that it had a minimum of text input, and a maximum use of video and graphics. She thought that interactive applications with little or no text—applications that relied most heavily on visual and graphic presentations of information—would enable her educational efforts. We met people from all over the globe who were interested in the use of these new networks of communication to do grassroots organizing and to collectivize

across distances. What I learned in Beijing is that people are not only concerned about very material issues like clean water and stopping violence against women, but also about issues involving access to computer-mediated communication networks.

The Editors: The literature promoting Georgia Tech's M.S. in IDT describes it as interdisciplinary. Would you delineate for us how it is interdisciplinary and also the extent to which theory, definitions, and obstacles, for example, have shaped and continue to shape the future of that program?

Anne Balsamo: Our program is interdisciplinary in the sense that our courses and faculty draw on literary studies, media studies, cognitive science, computer-interface design, art history, graphic design, and film and video. Moreover, it is interdisciplinary in that we examine, not only the impact of these new communication technologies on contemporary culture, but also the practices of the people who use these technologies. So it's sociological and cultural in its scope. We study new forms of cultural expression—video art, 'zines, web pages—to see how the medium is developing in terms of expressive conventions and interaction patterns. Given that multimedia is a convergence of print, film, audio, television, photography, graphics, and so on, we study how the conventions that mark these older forms of media are imported and transformed in and through the convergence that new media enable. Students, in particular, are keen to study the possibilities of the new media for novel expression, new forms, and new genres.

The program is interdisciplinary in the sense of the deep knowledge it draws on and in the sense of what it takes as its object of study. Technology itself is an interdisciplinary object. Most of the traditional disciplines have tried to take technology into account either in terms of its domain knowledge, or in terms of how it can be used as a pedagogical tool. In focusing on technologies of communication and new media, we focus on things that are themselves interdisciplinary, and that require multiple disciplinary insights to make sense of and to fully exploit.

The Editors: Aren't you really talking about cross-disciplinarity rather than interdisciplinarity? Your students are taking courses in many fields, but whose frame are they using to look at these different fields, and the different practices and forms of expression within each? The literature about the IDT master's might suggest that the program has, for example, a cognitivist emphasis. Who decides what frames students are going to have as they work in your program?

Anne Balsamo: First of all, it's not really cross-disciplinary because students don't take a sociology class, a history class, a literature class. They are exposed to those disciplines through the faculty and through the courses offered in the IDT program. For example, the course I teach, called "Studies in Communication and Culture" is framed through cultural studies. I chose this framework in part because of my academic background, and in part because it represents a common ground for many of the faculty in the School of Literature, Communication, and Culture. We do have two faculty who have backgrounds in cognitive science: Joseph Petraglia-Bahri and Nancy Nercessian. Both of them teach courses in the Cognitive Science Program located in the College of Computing. Two or three other faculty members are actually trained in American Studies. And yet other faculty are trained in composition studies, drama, and literature.

The Editors: What sort of projects and theses have students in the program been producing?

Anne Balsamo: We have some students who are doing traditional theses—research projects either self-designed or projects that grew out of their advisors' research. For example, a few of our students are working on interface-design research projects and are working with faculty in IDT and GVU (Georgia Tech's Graphics, Visualization, and Usability Center). In contrast to a computer science graduate, an IDT student will work on the design rather than the programming of an interface feature. We also have a number of students interested in the artistic possibilities of new media, the Web and so on. In fact, we just sponsored a video art performance featuring some of the work of IDT students and

faculty. Another group of students just won the outstanding paper at the recent hypertext conference for its work on an interactive video application called "Hypercafe."

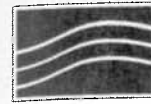
And then we have a number of students who are working on educational applications. A really wonderful project is Carolyn Cole's Web site called "A Busy Teacher's Web Site." It is designed to be an educational resource for K-12 teachers. Carolyn reviews and annotates the Web sites that purport to offer information that would be useful to such teachers. Her contribution is to screen these sites—new ones appear daily—to save teachers' time. She functions as an electronic editor of a richly annotated and organized electronic bibliography of URLs. Currently, she is working with a group of teachers to redesign the site to make it even more useful for them. It's a very exciting project that has garnered well-deserved praise in the professional press. These represent the range of projects our students work on.

The Editors: In terms of interdisciplinarity, what obstacles, if any, have you and your colleagues found relating to your program?

Anne Balsamo: We don't know where to find new faculty. We've been very lucky with the faculty who were already in the School of Literature, Communication, and Culture—if they weren't already trained in interdisciplinary studies, they were moving in that direction. Last year is the first year that we advertised for IDT faculty positions. We hired two wonderful junior faculty who have the unique distinction of having expertise in both theory and practice. We anticipate another position or two during the next two years. There is some pressure from the administration to add more students; if we do, we will have to add more faculty lines.

One of the biggest obstacles is that we don't know where to find the teachers we need. As a former English department, we're used to hiring through the MLA [Modern Language Association] job cycle. But it is becoming increasingly clear that the MLA audience may not be the right one for our ads or for our jobs. For example, this year we searched for someone in visualization theory and graphic design—not your typical English department

specialties. But on the other hand, if we advertise in the College Art Association publication, we may not find the people who have the background in interpretive theory. Although we will continue to advertise in the MLA and CAA journals, a new strategy we're using is to identify the Ph.D. programs that are producing interdisciplinary scholars and to send our ads directly to those program administrators. It will give us an opportunity to retool the program once more and to focus more closely on course sequencing. It's a very quick program. Students are here only for two academic years. We want them to do a lot while they're here.



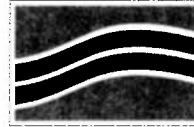
Other Voices

Since the appearance of our first call for manuscripts, we have received submissions that do not fulfill all the usual requirements for a traditional journal article, but which, nevertheless, make valuable contributions to the continuing discussion of writing about public discourse that Issues in Writing seeks to foster. We have designed the "Other Voices" section with these kinds of works in mind. We are pleased to include yet another stimulating piece under this rubric. The editors encourage readers who wish to add to the conversations begun by the authors whose works appear in "Other Voices" to do so by writing The Editors, Issues in Writing, Department of English, University of Wisconsin-Stevens Point, Stevens Point, WI 54481.

Teaching with Technology: Reading, Writing, and Singing to Save My Life

Will Hochman

The dynamics of what it means to be a writing teacher deeply involved with computers are changing. Are computers helping to further pedagogy or merely additional to faculty responsibilities? Are new types of professors and department members needed to support the ongoing learning created by computers or are we bound simply to incorporate the frustration of technology into the general frustration and difficulty of learning? Despite the lack of resources and flexibility in many of our universities, there's good reason to hope that we can develop better ways to learn with computers.



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