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Introduction

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I teach a course for undergraduates called *Literacy in the Information Age*. In the course we explore how the nature of texts is changing as they are re-presented through online communities, web sites, video, hypermedia, virtual reality, robotics, and other new technologies. These changes call on us to ask questions about readers, writers, and texts, and what they mean for our intellectual, cultural, political, ethical, and personal lives.

A key question concerns the impact on young people themselves: how they make meaning as they both respond to and create texts; how cultural meanings are re-created within the new media. Students read and discuss changing notions of literacy; they study new literacy practices through a research project; and they learn from each other through discussions about current events and personal experiences with new information and communication technologies.

Rather than having a fixed syllabus, which I guide the students through systematically, I find that our syllabus is continually evolving. As Nancie Atwell says in *In the Middle* (1987), the curriculum is not created in advance by me, but instead "grounded in the logic of learning" (p. 3) -- it unfolds as the students and I learn together about the new literacies. Students in the course learn, and teach me about topics as varied as cyberart, Internet radio, the digital divide in developing countries, privacy on the web, censorship, virtual reality, emoticons, open source, collaboratories, online learning, visual literacy, copyright law and cultural values, email etiquette, and representations of fairy tales in new media. We tie these diverse topics together through sharing the projects and examining the implications for literacy.

Instant Messaging: Re-Creating Self and Technology

A good example of this occurred in our discussions of computer-mediated communication. Books and articles abound to explain the different tools, such as

email, bulleting boards, instant messaging, and video conferences, with analyses of the strengths and weaknesses of different technologies, and studies of their use. But I often find that what I read falls short of explaining the on-the-ground experiences of my students and myself.

In the spring semester of 2002, one student, Isaac Oates, developed a program, called *GradeAIM*, to allow users to upload their AOL Instant Messenger (AIM) buddy list to a web site at the National Center for Supercomputing Applications. The program can then display the social network implied by that list - which users are on the buddy list (one degree of separation), which are on the list of one of those "buddies" (two degrees of separation), and so on. For example, the figure below shows that user #1500 has 10 others on his or her buddy list, and that those buddies have collectively 70 additional buddies. Thus, user #1500 is only two degrees of separation from 80 other AIM users.

These are remarkable numbers, especially for anyone who has sent email to a class list and wondered whether anyone actually read it. Soon, there were requests from other campuses around the country, requests that could not be accommodated due to limited web server capacity.

What I saw through this project was not only that many students use AIM, but that there was an intense interest in seeing how one's use compared to others. There was soon a competition to see whose name was on the most other buddy lists. Interestingly, although there was a large variation at one degree of separation, by three or four degrees of separation most students were connected to the same number of others, and after six degrees, no new names appeared; every name on new buddy lists was already in the database. Through the social network diagrams and their thoughts about their connectedness to others, students came to see themselves in new ways.

But this story did not end with one project. I was curious about the fact that nearly every student used some form of instant messaging, though not necessarily AIM. That was so, despite the fact that I never felt much use for it. Moreover, when I talked with faculty, I found that many had never heard of it; those who had heard of it had little interest in trying it; and those who had tried it never wanted to use it again. There were a few exceptions of course, but on the whole, students were avid users and faculty were avid non-users. In contrast, every student and faculty member uses email to communicate. This posed a challenge for the class as well as for me. We usually don't see such stark disparities in the use of new technologies.

Students talked about the various ways they did use instant messaging. It was interesting to hear about the way international students use it to stay in contact with friends and family in their home countries. This leads to distinct preferences regarding instant message programs, because of which writing script they support. One surprise was the key role instant messaging plays in doing homework. A student "messages" another student to get details of an assignment or to consult about a problem. They coordinate their social time and their study time, arranging to meet at a certain point when "enough" has been done on the homework. It became clear that, for better or worse, instant messaging has become a key fixture in the university experience, and one about which many faculty have little knowledge.

Faculty were generally outspoken about their own potential use, saying things such as "I'm too busy!" or "I get too much email as is; why would I want to get more electronic communication?" But that still left the question: Why yes for students and no for faculty? Why did it fit into the information ecology for students and not for their teachers, even though both groups are heavy computer users, and both use the web and email extensively?

One clue came in a later class. A student related that he left his "away message" on even when he was at his computer using it. That way, he could see who was trying to contact him without having to reveal that he was there. Thus, he was screening calls, in a way analogous to the way many people use answering machines on their telephones. Further discussion revealed that most, if not all of the students in the class used away messages in a similar way. They had effectively re-interpreted a component of the instant messaging programs to better meet their own social needs, using the away message primarily for those times when they were actually there and often not when they were actually away.

But there was more. One student admitted that she sometimes went systematically through her buddy list to read the away messages of all her friends. That way she could find out what they were doing, even though she realized that in many cases what they were doing was working at the computer, while declaring that they were away. That also turned out to be a common practice, one that partially explains why there is such a disparity between student and faculty use. By using away messages in this way, students essentially turn a synchronous mode of communication (the "instant" in instant messaging) into an asynchronous mode. Thus, it begins to take on some of the characteristics of the asynchronous email, which faculty do in fact use.

The story continues. Students in a later class session, brought in web links for spy programs, such as IMSPOT <http://www.imspot.com>, which allow the user to see who is checking your away messages. As IMSPOT says about its "tracker": "This feature allows you to find out for once and for all who's viewing your profile and away messages while you're not looking. Is it a friend or family member or the new office secretary, or maybe it's that shy classmate?"

Thus, students are immersed in an evolving world of new technology development. Their use of away messages, their selection of tools, and the *GradeAIM* project show that they are not merely passive recipients of these technologies, rather

they are active interpreters and re-constructors of it. That is not to say that they are not subject to the political, cultural, and commercial structuring of relations through these tools, but that the full story requires a consideration of their agency as well.

What this continuing saga says to me is that even a simple computer application, such as instant messaging, one that I don't actually want to use, can play an intricate and fascinating role in people's lives. It is both a text for understanding, one with inexhaustible "*sources of possibilities of meaning*, rather than a passive object of investigation" (Linge, 1976, p. xix), and a text to be written anew. As a text it bears on students' use of other representational and communication media, on their language and cultural background, on the way they learn, work and play, on their social relations, on their community, and on their sense of self, in short, on the evolving meaning of their literacy.

Where are We Going?

The literature of science fiction provides us with vivid images of life in the future. To understand that new realm, we look for a computer like HAL from *2001: A Space Odyssey* to guide us as we work and play with robots, explore strange lands and times through holodecks, or transport our bodies on rocket ships. But as fanciful as these notions may be they often pale in comparison with the latest news items about cloning, virtual reality, and microbots.

As much as writers try to go beyond the everyday reality, they must deal with the fact that we live in what cyberpunk author William Gibson calls "our increasingly science-fictional present." One consequence is that the writings of classical Sci-Fi writers, such as Robert Heinlein or Isaac Asimov, seem more of this world than in contrast to it. Even the more updated versions we see in Octavia Butler, Philip K. Dick, or Ursula K. LeGuin overlap with the news of the day. As Ray Bradbury says: "Science fiction itself has remained the same. We have caught up to it....We're surrounded by cellular phones and fax machines and computers. We are a science-fiction generation."

The tools many of us use everyday outstrip what writers envisioned just a decade ago. Sci-Fi screenwriter Ron Shusett (*Total Recall*, *Alien*) laments, "We can't think far enough ahead any more" (all of the Sci-Fi writer quotes from Kim, 1996). The only saving condition for Sci-Fi artists is that the new tools of hypertext, online

discussion forums, multimedia authoring systems, retinal scanners, and virtual reality, which just a short while ago were the content of science fiction, are now available for them to use in creating science fiction. Thus, creators of movie and television content now regularly employ once fanciful tools.

Most of us hold contradictory feelings about these new technologies. On the one hand, we find that the excitement around new developments is too often revealed to be just hyperbole. Moreover, the focus on technology alone takes us away from the important questions of life. As Thoreau once said, (1971 p. 52)

Our inventions are wont to be pretty toys, which distract our attention from serious things. They are but improved means to an unimproved end, an end which it was already but too easy to arrive at; as railroads lead to Boston or New York. We are in great haste to construct a magnetic telegraph from Maine to Texas; but Maine and Texas, it may be, have nothing important to communicate.

At the same time, we can easily be enthralled by the possibilities of new media. We realize that being able to take a digital photo and send it instantly to a far-away friend, to build an online community of people with similar interests, or to study online from a distant university, are just harbingers of what may be coming. Hyperbole soon slides into understatement. As Arthur C. Clarke, author of *2001: A Space Odyssey*, says (quoted in Stix, 2001, p. 36): "First our expectations of what occurs outrun what's actually happening, and then eventually what actually happens far exceeds our expectations."

What will Prepare Us?

Educators today feel both the excitement of this emerging world and the challenge of preparing young people to live productively within it. They rightly wonder how to assess the changes they see in the new information age and how to decide what learning experiences can best prepare students for it. There are calls now for computer training as a core component of literacy and worries about issues such as web site content and the need for new literacy skills. In this context, teachers worry about how they can teach the technical skills that are sometimes more foreign to them than they are to their students.

To answer the question of what today's students need to learn, we could ask those who thrive there. One candidate is Nathan Shedroff, who is currently Creative Director and a co-founder of vivid publishing, inc., an information products company that creates projects in both electronic and print media. In an interview with *internet.au* (1997), the Australian magazine about the internet, Shedroff was asked what he wished he had learned more about in school to prepare himself for his current work. He said:

Few people are ever taught to create successful, satisfying experiences for others. Mostly, those folks are in the performing arts: dancers, comedians, storytellers, singers, actors, etc. I now wish I had more training in theater and performing arts to rely on ... especially improvisational theater. That's like the highest form of interactivity.

The contrast between improvisational theater and what many of us might have predicted Shedroff would say (how to program a computer? how to make web pages? fundamental engineering principles?) is striking.

Shedroff does not cite the need for more technical skills, even though he probably feels that need at times, but rather, a desire to be have learned how to be more fully human in his interactions with others. His work recalls Murnane and Levy's (1996) argument that the new basic skills are not only the *hard skills* of minimal reading, writing, and computation, but the *soft skills* such as the ability to communicate effectively both orally and in writing, and the ability to work productively with people from different backgrounds. Understanding the perspective of others, being able to work with complex, messy situations, and learning how to learn may become more crucial than ever.

The web designer's words also take us back to John Dewey's *Experience and Education*, in which he shows that the idea of education as preparation for life is self-contradictory. When we learn things or develop skills removed from their context of use, we too often find them in sealed away in what Dewey calls a water-tight compartment. Dewey writes:

We always live at the time we live and not at some other time, and only by extracting at each present time the full meaning of each present experience are we prepared for doing the same thing in the future.

How then do we help learners as we all become immersed in a new information age? The answer may be neither to embrace the new information changes as unquestioned human advances nor to reject them as ephemeral and misguided. Instead, we need a way to engage critically with them—to understand the promises as well as the perils. Doing so would mean applying what Walter Kaufman (1977) calls *dialectical reading* to the evolving new media culture. This means that as we attempt to understand and engage with the changes before us, we neither embrace nor reject them, but rather enter into a kind of dialogue with them, asking what they mean and what they could be, and how our interactions with them can lead to useful reflection on who we are.

This Book

When John Elkins and Allan Luke kindly asked me to write/edit the "Technology Department" for the *Journal of Adolescent and Adult Literacy*, we conceived it as a space for dialogue about the unfolding of new literacies, not as a medium to deliver fixed conceptions of what these literacies are now or ought to be. The aim was to "increase dialogue about new communication and information technologies and explore what these media mean for literacy and literacy educators... to engage with these rapidly evolving literacy practices...[and] to understand what they imply for literacy education." The department has examined various aspects of the new literacies and their implications for teachers and students. Any given month may "focus on changing literacies, learning, equity, school and work, censorship, globalization, language, or other issues that we need to rethink in light of our changing technological world." (Bruce, Chapter 1).

We assumed that readers "vary greatly in terms of how comfortable they feel with new technologies, but that nearly all ... are aware that they pose new challenges and opportunities for becoming literate in today's world." Each column suggests "something of the hypertextual, multimedia world we are entering." In addition to a monthly "email" message, there is an Issue of the month, a Data View (about new technologies), Interpretations, a Literacy Web Page of the Month, Web sites to visit, a Glossary, and other components, each with links to more information on the World Wide Web.

In the beginning I wrote most of the columns, but I soon realized that the series would be richer if I could bring in other perspectives, so in the second year, I began to invite guest authors. Those now represented come from four different

countries. Some are long-time colleagues, and some are new. Several of them are students or former students, including three undergraduates from the *Literacy in the Information Age* course

The column, now chapter, authors critique the way literacy practices are evolving as they simultaneously become ever more central in our lives. They examine the changing nature of texts themselves as they are transmitted via oral, print, and electronic media (including online communities, web sites, video, hypermedia, virtual reality, and other new technologies). As the first chapter in this book argues, we often don't notice the technologies of literacy. But the means and the media by which people communicate are deeply embedded in our daily practices.

The chapters also revisit enduring questions about the readers and writers of texts. The questions they ask build upon traditions including reader response, folklore theory, writing studies, and human computer interaction. They employ a variety of research methods, including discourse and textual analysis, web site analysis, interviews, and ethnography. While acknowledging at the outset that the questions cannot be neatly categorized, I nevertheless grouped the chapters into six broad areas:

- How have literacy practices changed over time, and responded to new technologies? What is the future of literacy?
- What media are emerging in our literacy practices? How do technological, linguistic, political, and economic forces shape literacy practices today?
- How is meaning constructed in both personal and social terms?
- How are ethical and policy issues shaped by the changes in literacy?
- How can we understand and facilitate learning through new technologies?
- What role do the new literacies play in creating and maintaining community?

The chapters provide tools for exploring these questions. Moreover, the authors are themselves engaged in creating as well as critiquing the new world we are entering. They show us possibilities for both understanding our past and shaping our futures.

References

Atwell, N. (1987). *In the middle: Writing, reading, and learning with adolescents*. Portsmouth, NH: Boynton Cook.

- Dewey, J. (1938). *Experience and education*. New York: Collier Books.
- internet.au. (1997, February). Interview: vivid: strikingly bright. *internet.au*, no. 16, pp. 40-41.
- Kaufmann, W. (1977). The art of reading. In W. Kaufmann, *The future of the humanities* (pp. 47-83). New York: Thomas Y. Crowell.
- Kim, Albert (1996). Sci-fi invades Hollywood. *Entertainment Weekly* [Online: <http://www.ew.com/ew/features/archive/xfiles/scifi/251scifimain.html>]
- Linge, David (1976). Editor's introduction. In Hans-Georg Gadamer, *Philosophical hermeneutics* (tr. and ed. D. Linge) (pp. xi-lvii). Berkeley: University of California Press.
- Murnane, R. J., & Levy, F. (1996). *Teaching the new basic skills: Principles for educating children to thrive in a changing economy*. New York: Free Press.
- Thoreau, Henry David (1971). *Walden* (ed. J. Lyndon Shanley). Princeton: Princeton University Press.
- Stix, Gary (2001, January). 2001: A scorecard. *Scientific American*, 284(1), 36.
- White, Jessica (2002, March 5). Six degrees of instant messaging. *The Daily Illini* [Online: http://www.dailyillini.com/mar02/mar05/news/stories/news_story05.shtml]

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