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TECHNOLOGY: LITERACY IN THE

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IMPACT OF PAYING ATTENTION

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1 Literacy and Technology Linked: The National Project to Expand Technological Literacy

[T]he NII can transform the lives of the American people—ameliorating the constraints of geography, disability, and economic status—giving all Americans a fair opportunity to go as far as their talents and ambitions will take them. . . .

The . . . NII will “create as much as \$300 billion annually in new sales across a range of industries.” The . . . NII would increase the GDP by \$194 billion . . . [and add] \$321 billion to the GNP by the year 2007, and increase productivity by 20 to 40 percent. (*National Information Infrastructure* 4)

Technological literacy—meaning computer skills and the ability to use computers and other technology to improve learning, productivity, and performance—has become as fundamental to a person’s ability to navigate through society as traditional skills like reading, writing, and arithmetic. . . .

[O]n February 15, 1996, President Clinton and Vice President Gore announced the Technology Literacy Challenge, envisioning a twenty-first century where all students are technologically literate. The challenge was put before the nation as a whole, with responsibility shared by local communities, states, the private sector, educators, local communities, parents, the federal government, and others. (*Getting America’s Students Ready* 5)

Literacy’s Changing Agenda

Literacy alone is no longer our business. Literacy and technology are. Or so they must become.

Who would have predicted that English studies, composition, and language arts teachers at the beginning of the twenty-first century would be so desperately needed? And needed not only for our expertise with language and literacy studies but for the attention we pay—as humanist scholars, teachers, and citizens—to the complex set of social, political, educational, and economic challenges associated with technology. But here we are.

Increasingly, literacy educators have recognized that Americans need help as they prepare to face the technological challenges of the next century, that the primary battles of the computer revolution are far from over. In print, television, and on-line media and thus in our country's collectively structured public imagination, significant battles are still being waged over computer technology and its relationship to various social agendas, both dominant and minority, within the United States. Americans continue to struggle with the government's responsibility for providing access to technology and with the corporate sector's responsibility for remaining competitive in an increasingly technological global market. Many wrestle as well with the role of the country's educational system in producing an informed citizenry that knows how to use computers and with the responsibility that parents have for providing children with computer support at home. Many are confronted with the changing nature of intellectual property in electronic environments, changing expectations about privacy in personal e-mail exchanges, and changing understandings of what it means to be a writer or a reader or even a person in cyber environments. And these questions represent only a few of the issues that technology raises.

These struggles—and the public debates that characterize them—are significant because they help shape America's ongoing relationship with technology, the ways in which citizens think of human agency within this relationship, and the ways in which Americans put computers to work in the service of those social projects that are most important to the nation's commonweal.

Nowhere are such struggles and debates rendered in more complex terms—and nowhere are they more influential—than in the field of literacy: composition, language arts, and rhetoric. For teach-

ers, literacy instruction is now inextricably linked with technology. Moreover, since 1993, an official national project to expand technological literacy has been launched in America's schools, homes, and workplaces, changing the ways in which both literacy educators and the publics they serve think about, value, and practice literacy. This national project bears directly on the work we do as literacy specialists. Technology has become part of our responsibility, whether we like it or not.

My purpose is to convince teachers of English studies, composition, and language arts that we must turn our attention to technology and its general relationship to literacy education. On the specific project to expand technological literacy, we must bring to bear the collective strength of our profession and the broad range of intellectual skills we can muster as a diverse set of individuals. The price we pay for ignoring this situation is the clear and shameful recognition that we have failed students, failed as humanists, and failed to establish an ethical foundation for future educational efforts in this country.

The Challenges Associated with the New Agenda

If the increasingly strong cultural link between technology and literacy is the general area of concern in this book, the specific case study of this cultural formation is the current national project to expand technological literacy, officially identified as the Technology Literacy Challenge by the Clinton administration (*Getting America's Students Ready*). This project aims to create a citizenry comfortable in using computers not only for the purposes of calculating, programming, and designing but also for the purposes of reading, writing, and communicating. It is an excellent case study of a national literacy project because of the tremendous scope, significance, currency, and cost associated with such goals.

According to its sponsors, this large-scale literacy project will offer all Americans equal access to an education rich in opportunities to use and learn about technology. With such an education, the project's sponsors claim, graduates will be qualified for high-paying

high-tech jobs and thus have the means of achieving upward social mobility and economic prosperity within our increasingly technological culture.

To achieve this goal, American schools must help “all of our children to become technologically literate” by teaching them to use communication technologies, specifically computers, in the practice of reading and writing effectively. The deadline for creating such a citizenry—one that understands literacy practices in terms of technological contexts—is “early in the 21st century” (*Getting America’s Students Ready* 3).

But if the project to expand technological literacy has been justified as a means of achieving positive social change and new opportunity, to date it has failed to yield the significant social progress or productive changes that many people have come to hope for. Indeed, in the American school system as a whole, and in the culture that this system reflects, computers continue to be distributed differentially along the related axes of race and socioeconomic status, and this distribution contributes to ongoing patterns of racism and to the continuation of poverty.

It is a fact, for instance, that schools primarily serving students of color and poor students continue to have access to fewer computers and to less sophisticated computer equipment than do schools primarily serving more affluent students or white students. And it is a fact that schools primarily serving students of color and poor students continue to have less access to the Internet, to multimedia equipment, to CD-ROM equipment, to local area networks, and to videodisk technology than do schools primarily serving more affluent and white students (Coley, Crandler, and Engle 3).

These data, which are profoundly disturbing, become all the more problematic if we trace the extended effects of the technology-literacy link into the country’s workplaces and homes. There, too, the latest census figures indicate, the link is strongly correlated to both race and socioeconomic status. Black employees are less likely than white employees to use a range of computer applications in their workplace environments. Employees who have not graduated

from high school are less likely to use a range of computer applications than are employees who have a high school diploma or have some college experience. And families of color and families with low incomes are less likely to own and use computers than white families and families with higher incomes (see *Condition of Education 1997* 212; *Digest of Education Statistics 1996* 458–59; *Getting America’s Students Ready* 36). In other words, the poorer and the less educated Americans are in this country—both of which conditions continue to be closely correlated with race—the less likely they are to have access to computers and to high-paying high-tech jobs.

In these terms, then, the national project to expand technological literacy has not resulted in a better life or more democratic opportunities or an enriched educational experience for all Americans, as most of us might wish. Rather, it has served to improve the education only for some Americans. This specific project—and the more general social forces and formations that sustain it—substitutes a value on competition and consumerism for a commitment to equal opportunity, democratic cooperation, and a public education that serves the common good of this country’s peoples.

In a formulation that literacy educators will feel most keenly, the project to expand technological literacy implicates literacy and illiteracy—in their officially defined forms—in the continued reproduction of poverty and racism. And it implicates teachers as well, despite our best intentions.

The Social and Educational Effects of the New Agenda

An honest examination of the situation surrounding the project to expand technological literacy suggests that these two complex cultural formations, technology and literacy, have become linked in ways that exacerbate current educational and social inequities in the United States rather than addressing them productively. Such an examination encourages teachers to admit, moreover, that we may be partially responsible for this bad, even shameful, situation.

The project to expand technological literacy has not clearly benefited all Americans in ways that would warrant its expense, despite the size and scope of the efforts that have been undertaken thus far.

Of course, it is true that some Americans have benefited. Certainly the computer industry has grown during the 1990s (see *Economic Report of the President*; Freeman; Goodman; McConnell; Warnke). And the project has created some changes in the nation's schools. As of 1994, for example, 68.3 percent of fourth-grade students, 82.3 percent of eighth graders, and 86.9 percent of high school juniors were writing stories or papers on computers (*Condition of Education 1997* 56), and 43 percent of fourth-grade teachers and 17 percent of eighth-grade teachers reported using computers to teach reading (Coley, Crandler, and Engle 29). Today, 98 percent of all schools own at least some computers, and the ratio of computers to students, at 1:10, is at an all-time low (Coley, Crandler, and Engle 3). In some cases, these changes have resulted in educational approaches that are increasingly engaging and rewarding for students, that reduce some of the unnecessary labor associated with writing (e.g., recopying text in the effort of revising, photocopying, or reproducing copies of texts in order to share them with others), or that alleviate the workload of teachers (see *Getting America's Students Ready*; Hawisher et al.; Handa; Selfe and Hilligoss; and Strickland).

However, the national project to expand technological literacy has also failed to yield some of the expected reforms. For example, although it has resulted in some surface changes in how literacy is practiced and what Americans consider literate behaviors, it has not resulted in an improved life for all citizens—especially poor students or students of color who, within this country's educational system, continue to have less access to technology (Coley, Crandler, and Engle) and who suffer from a higher incidence of educational failure than wealthier students and white students (*Condition of Education 1997* 212).

Indeed, although the project has been justified as a means of achieving positive social change and new opportunity, it actually

serves a fundamentally conservative role. This project is linked to the continued reproduction of the following familiar social elements:

- A “literate” segment of society—composed of individuals with relatively high levels of technological literacy skills, distributed generally along existing axes of wealth and privilege—who will yield the country's leaders and productively employed workers.
- An “illiterate” segment of society—so labeled because individuals within it fail to acquire sufficient skills in technological literacy—on whom our culture relies for the most undesirable tasks in our society and who will continue to suffer disproportionately from persistent social problems like poverty and crime.
- A stable citizenry that continues to be sorted hierarchically into social subgroups based systematically on links between race and class and the related effects of differential literacy levels, educational opportunities, health environments, and access to technology.
- A citizenry that believes in the potential of high-tech literacy instruction to make lives better, to ensure progress, and to provide a route to economic prosperity. Unfortunately, the very hopefulness of this group generally blinds them to the important connection between the literacy instruction in our existing educational system and that system's role in reproducing persistent social problems.

Our Professional Responsibility

Surprisingly, given its broad cultural significance, this extensive national project has received little or no focused attention or comprehensive response from literacy teachers and scholars. In part, literacy issues have enjoyed such a low profile in discussions of this national project because teachers remain comfortable with the culture's traditional separation of arts and technology (see Snow; and Latour, Preface) as it has served to structure the responsibilities of

English studies professionals. This conventional separation, after all, has allowed us to use technology in our classrooms while generally absolving ourselves from the responsibility for planning for technology, thinking critically about technology, systematically assessing the value of technology, and making the difficult decisions associated with who pays for and has access to technology (see Hawisher and Selfe 1993; R. Selfe; Selfe and Selfe).

Even recognizing this historically determined set of attitudes, however, it is an understatement to say that literacy educators have failed to recognize the project to expand technological literacy as a coherent nationally funded venture. Indeed, teachers have not responded in any comprehensive or systematic fashion to this project, nor have the professional organizations that represent them demanded any involvement in shaping its goals, even though all teachers have been affected by it.

What makes this decided lack of professional involvement most disturbing is the increasing recognition that the claims associated with this large-scale literacy project have not been borne out. Our profession's reluctance to engage in focused ways with such a significant national effort is both disappointing and problematic. We cannot responsibly afford to maintain our current disinterested profile much longer without engaging in a willful ignorance that yields serious consequences.

What Is Technological Literacy?

In this book, readers will encounter two definitions of technological literacy. These definitions overlap, but they also differ.

The first definition is associated specifically with the national project to expand technological literacy and is identified in the 1996 federal publication *Getting America's Students Ready for the Twenty-First Century*:

[Technological literacy involves] computer skills and the ability to use computers and other technology to improve learning, productivity, and performance. (5)

It is clear, however, that this specific—and, in some senses, more narrow—functional definition, like the national project to expand technological literacy, grows out of a broader cultural link between technology and literacy. And this broader link—characterized by a related set of social values, formations, and activities—suggests the need for a second definition of technological literacy as a cultural phenomenon, one that includes cultural dimensions, incorporating what Brian Street identifies as both literacy “events” and literacy “practices” (2).

In this context, the second definition of technological literacy that this book offers (and, indeed, focuses on) refers not only to what is often called “computer literacy,” that is, people’s functional understanding of what computers are and how they are used, or their basic familiarity with the mechanical skills of keyboarding, storing information, and retrieving it. Rather, *technological literacy* refers to a complex set of socially and culturally situated values, practices, and skills involved in operating linguistically within the context of electronic environments, including reading, writing, and communicating. The term further refers to the linking of technology and literacy at fundamental levels of both conception and social practice. In this context, technological literacy refers to social and cultural contexts for discourse and communication, as well as the social and linguistic products and practices of communication and the ways in which electronic communication environments have become essential parts of our cultural understanding of what it means to be literate.

At the level of literacy events, this second definition of technological literacy refers to the events that involve reading, writing, and communicating within computer-based environments, all of which have come to be socially identified as literate activities. These include understanding and valuing the uses of common computer applications for generating, organizing, manipulating, researching, producing, and distributing information, discourse, and texts (print, still graphics, moving images); and using such tools as databases, word-processing packages, multimedia production packages, e-mail, listserv software, bulletin boards, and graphics and line-art

packages. At this level, the term *technological literacy* also refers to the activities associated with navigating on-line communication environments such as the World Wide Web (WWW), the Internet, activities that require, for example, the use of browsers and search engines in order to locate information and engage in on-line conversations.

This second definition of technological literacy, however, also operates at the level of literacy practices. These practices, when examined within the context of a larger social fabric, as literacy scholars such as Street and Gee both point out, reveal robustly defined cultural understandings of the term *literacy* as they are constructed by individuals and groups in specific social settings. When practices of technological literacy are studied closely, they reveal complex sets of cultural beliefs and values that influence—and are influenced by—collective, individual, and historical understandings of what it means to read, write, make meaning, and communicate via computers and within on-line environments.

Cultural values, which are often deeply “sedimented,” to use Anthony Giddens’s term (22) in history and practice, help determine why some technological literacy skills and practices are associated with this country’s official system of literacy and literacy education (as represented in more regulated sites such as school standards and curricula, government documents on education and educational programs, public criteria for the hiring of corporate employees, or educational software products published for home tutoring use) and other practices—in contrast, with a system of nonofficial technological literacy (e.g., as represented in less regulated sites on the WWW, in homes, and in computer games). Given this social and cultural context, those technological literacy skills and practices associated with official efforts are generally considered useful and appropriate (e.g., using the WWW to do research for a project assigned in the workplace, using an e-mail list to communicate with people from other cultures or to practice a skill in another language as assigned in a schooling context, or using a graphics package to illustrate a formal report to a local government representative); and those technological literacy activities associated with nonofficial

situations and settings are often considered to be either problematic (e.g., frequenting WWW chatrooms predominated by marginal social groups, cruising the web for pornographic pictures, using the Internet to find recipes for designer drugs, using a web site to join a cult) or outside the official realm of technological literacy altogether (e.g., using an ATM machine, playing a handheld video game, programming a VCR).

Our culture’s understanding of official literacy events and practices is shaped by complexly related social formations that function within historical, economic, political, and ideological contexts. Government values on control, competition, and research, for instance, influenced technological literacy practices on the original ARPANET and continue to do so on the National Information Infrastructure (NII). These communication environments first supported government-sponsored military research and, later, corporate research and communication, educational research activities, the distribution of information to citizens, and the provision of citizen-based input to elected officials. Related to the social formation of the state, moreover, are those formations associated with capitalism, including the corporate and industrial sectors. And these sectors, too, contribute to a collective cultural understanding of the official skills that make up technological literacy.

Many corporate literacy practices and values, for example, are determined within the regulating environments of state or federal legislation, government grant programs, or military contracts. Corporate-sponsored projects necessitating the use of the NII, the WWW, or in-house intranets, for instance, often place a high value on the efficiency of communication. In such environments, employees learn to value the speed of e-mail exchanges, the ability to distribute information quickly and widely, and the transactional functions of language. Within the daily operations of the workplace, employees also come to understand that some computer tools and activities are seen as more useful, more focused on corporate outcomes, more productive—and hence more official—than others. Among these might be the use of database tools to enhance the efficient structuring of information within a corporate setting, the use

