

## **SUPERHIGHWAYS, WORK, AND INFRASTRUCTURE IN THE INFORMATION AGE: A SYMPOSIUM**

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### **John Buschman**

Higher education has seen both optimism and, simultaneously, dire warnings about the changes coming from new information technologies. On the optimistic side, Robert Jensen reports in a recent *Academe* (July/August 1993) "that education is in the midst of a monumental technological paradigm shift, one that will eventually change the way that all instructors teach and the way that all students learn." As a result, "higher education will improve significantly for most students." Of the warnings, it is routine for political and educational leaders to assert that enrollments will be linked to the availability of technological resources on campuses, that attempting to prepare students for a technologically dominated "information society" with 19th century teaching methods will lead to social obsolescence, and that technology is the answer to the burgeoning costs of delivering information.

Both rhetorical approaches assume the ascendancy, and then the primacy, of the role of information technology in higher education. Thus the fiscal, curricular, and research decisions flowing from that underlying assumption have the appearance of necessary accommodation to the inevitable. Our choice *seems* simple: the exciting new (albeit sometimes reluctant) plugged-in professor versus the dangerously irrelevant chalk-and-talk type. However, a clear discussion of the professional and pedagogical concerns of faculty is missing. There *are* tradeoffs in adopting these technologies, and those are not being widely debated. While there are plenty of policy and theoretical problems to take issue with, I wish to concentrate on four basic and immediate ones which should concern the profession: privacy and academ-

ic freedom in the electronic environment, preservation of electronic records, instructional effectiveness of electronic teaching resources, and the costs. It is in these areas that the profession faces some choices and challenges right now. I will try and briefly outline some of the concerns in each.

### **Privacy and Academic Freedom Issues**

The new networks in place - and those envisioned for the future - have some immediate problems for privacy, and consequently, the academic freedom of the profession. First, the software designed to run networks - including campus networks - allow network managers to read, copy, or delete files and messages stored on connected remote computers or in accounts. E-mail, as one example of a widespread application on campuses, occupies a legal gray area in workplace privacy law. Marc Rotenberg, Director of Computer Professionals for Social Responsibility has observed "that e-mail is more like a postcard than a sealed letter." While wholesale invasions of faculty files are probably not happening on campuses right now because of long fought-over traditions of academic freedom, a recent survey by the computer magazine *Macworld* (July 1993) estimated that 20 million Americans are now subjected to electronic eavesdropping in their work.

Secondly, the immense economic and legal battle over electronic copyright has begun. The upshot may well be that copyrighted documents delivered over networks are paid for on a per-use basis. This means that the individual readings of scholars and students - the subjects, contents, patterns of inquiry of individuals contained in the articles, books, chapters, media, and newspapers electronically delivered to them - would be tracked by the system set up to monitor copyright payments. This was made crystal clear in a recent report noting that publishers plan "to enforce their copyrights and collect royalty fees by using reader-identification and metering devices that will keep track of what a user reads or prints" (*Chronicle of Higher Education* 11-24-93, A15).

This represents a radical departure from the past because, while much of this type of information (in variously less-organized forms) has been available, it was in the hands of libraries and

librarians. Both the institutions and the professional colleagues that run them are deeply committed to free - and private - inquiry. For example, library circulation records are protected by many state laws and in the professional ethics of librarians, and such records are not archived after materials are returned. The new data collectors will not be libraries, but rather private information vending corporations. They might be required to keep reading records confidential, but it is probable that they *would* be able to use them for marketing purposes. Such a system could construct an information-seeking profile to be sold to other marketers of information products. (This would merely replicate the pattern of the information collected by grocery chains on individual persons and their point-of-sale purchases.)<sup>1</sup>

Another problem for the professional privacy of academics is that such databases can be broken into by hackers and confidential information about individuals can be gathered. This is exactly what happened to Robert Bork during his nomination process for the Supreme Court. His video rental records were gathered by a reporter who broke into the computerized checkout system of the video store Bork used (*Economist* 3-12-88, 31). Even well-run and well-intentioned information corporations will expose sensitive and private information about scholars and students to such dangers. Further, even if there *were* ways to insure the privacy of records contained in corporate databanks, communication over electronic networks is not at all private. The federal government is moving aggressively to limit the encryption of messages and texts to formulas to which the government has a deciphering key in the name of combating terrorist and organized crime users of the networks. With wiretap-style authorization, government agencies can "listen in" on on-line conversations and read any encrypted texts. Messages can be nearly impossible to unscramble (i.e. completely private), unless they are limited to the use of known encrypting formulas. Thus there is a movement to ensure that network communications - the documents and information sent - are not "too private."<sup>2</sup>

The relationship of each of these to the essential privacy and academic freedom the profession depends upon is clear. What we read and when, what we write and send out, all have the potential to become much more transparent and monitored by

the many layers of administration and government in an electronic context. If the values of privacy and academic freedom are not built into the laws and into our own campus regulations, the effect could be an erosion of an essential value for which the professoriate has long fought. As a current example, the context of recent debates about hate speech and course content makes monitoring the electronic comments and communications of teachers a particularly sensitive issue (See *The Chronicle of Higher Education* 11-24-93, A16.)

### Preservation Issues

The record of scholarly, historical, and literary electronic production is in danger. Consider the controversies surrounding the electronic records of the Bush Administration. It took a lawsuit to save the backup tapes of the message system of the National Security Council from being erased. While the Bush Administration argued that the tapes contained no consequential documents, scholars noted that vital information concerning the Iran-contra scandal and the investigation of Manuel Noriega were found in them. Another suit was filed over the National Archivist ceding control of White House computer tapes to President Bush. He did this before subsequently being offered the job of running the Bush Presidential Library at Texas A&M University where the tapes will be stored and mounted. Electronic records present a different challenge to literary scholars who worry that the editing and revision process of contemporary writers may be lost forever - either through the overwriting of documents in word processing or in the degradation of disk copies of manuscripts. Photographic records on videocassettes and in digital form are similarly in danger, and the collection, preservation, and organization of the information available on the Internet - before it disappears forever - has yet to be extensively undertaken.<sup>3</sup>

Eugene Provenzo has noted just how easy it is to change, edit, or delete electronic and digital texts and photographs. The resulting differences in documents are obviously more difficult to trace than those made in analog text or traditional photographs. The reason for the intensity of the fight over the Bush Administration's records was the totality of control exercised by

erasing or editing the tapes and the lack of a "trail" to track down the original content or the existence of the document. Historians have long fought over veracity and availability when it comes to historical sources, but electronic records represent a new ability to control those sources. As one example, if our libraries convert extensively to document delivery systems from centralized, remote databases, the decision to "weed" certain documents from a virtual library's holdings is complete - it no longer exists in a database anywhere for any one. Unlike electronic formats, it has been noted that previously, "even the most severe kind of censorship [could] not track down every last copy of a book" (*IFLA Journal* 1987, 116). This is quite dramatically contrasted with our current, if imperfect system.

By way of further illustration of Provenzo's concerns, a major library organization put forth a chilling proposal a number of years ago in response to our "Information Explosion":

[T]he role of libraries for several thousand years, which emphasizes the preservation of the human record, has now become more complex, requiring hard decisions not only about what is to be preserved but also about what is to be discarded. Decisions...must be made to erase portions of the record deemed to be insignificant, irrelevant, and unrepresentative... (*American Libraries*, December 1977, 617)

It is clear that the profession needs to take an active interest in insuring the preservation, organization, and access to the range of scholarly resources and production in electronic formats.

#### Issues of Instructional Effectiveness

Perhaps the primary benefit claimed for information technologies is the projected quantum improvement in the teaching-learning process. I have already mentioned Jensen's claim to this effect, and he goes on to note the role of faculty "authoring hypermedia materials that will be available at all hours on campus networks [and] helping students choose from a mind-boggling multimedia library of worldwide learning material..." However, the actual efficacy of instructional technologies is much more difficult to ascertain. Even enthusiasts concede that this is "not a researchable question" and that "evidence that [it]

does have significant and sustained impact on learning is hard to produce" (*Chronicle of Higher Education* 5-5-93, A27-A29).

Political scientist Kenneth Janda has studied multimedia instruction as contrasted to alternate and traditional methods. His findings indicated that, while students *liked* the multimedia products better, this did not translate into better performance, more interest in the subject matter, or greater overall knowledge. After reviewing prior research, he concludes that the modelling capabilities of multimedia might be useful for mathematics and the sciences, but even research on teaching in those areas came to indefinite conclusions. If greater learning is taking place with information technology teaching tools, "then its advocates bear the burden of identifying and demonstrating these benefits - and whether the results are worth the considerable investment in time...and in the cost of the equipment needed for teaching with it."<sup>4</sup>

The ways in which teaching technologies shape content is an even bigger question than their effectiveness. This is a wide-ranging and somewhat unruly issue, but I will try and summarize it. Scholars in the fields of history and literature offer perhaps the clearest examples of the problems associated with media portrayals of academic content. The editing and abbreviation of film adaptations of works of literature is a well known and undesirable outcome of the shift from print to media. But even a product as laudable as an unabridged audiotape recording of a work of literature has inherent problems: you are left with at least "two readers...grappling for possession of the text.... The problem with taped narrative is that it all but cancels...the whole written-word-inner-voicing connections..." For historians, the well-regarded and critically acclaimed PBS series *The Civil War* generated heated debate about the place of media portrayals in the teaching of history. At best, such attempts to render history in the media still do not "embrace the dissonance of critical inquiry" at the heart of historical studies. Perhaps more succinctly, historians' emphasis on evaluating sources does not match media emphasis on images and suspending disbelief.<sup>5</sup>

Historical and literary studies are emblematic of what happens to content in all disciplines when it is transferred to media. As Neil Postman has noted,

Every medium gives and takes away, although not in equal measure, for media change does not necessarily result in equilibrium. [W]e are obliged to ask...what is happening as typography moves to the periphery of our culture and electronic media take their place at the center. [For instance,] a claim, whether true or false, must be made in language. More precisely, it must take the form of a proposition, for that is the universe of discourse from which such words as true and false come.... I submit that such questions do not apply to the world of visual images. One can like or dislike [the image], but one can not refute it. [These new media] are winning the competition with typography for the time, attention, and cognitive predispositions of our youth. (*Alternative Library Literature*, 1986/87, 39-42)

There is a decided move toward conflating and combining media products - the multimedia technologies discussed here are indications of this trend. The upshot is that there will probably be less ability to isolate traditional scholarly and teaching approaches - located in print - because many print resources will become multimedia. Further, there will also be more pressure on teachers to incorporate those digital texts with sound and image components into their courses if for no other reason than to make content more stimulating and appealing to students - not to mention use of these new tools as an evaluative criteria for teaching "effectiveness." Teaching and scholarship could become an extension of the art of persuading with images - like advertising.

Faculty should also not ignore the effect of sources of funding on the content of these new teaching tools. At best, the corporate perspective in product development influences which subjects become available first in the new formats. More worrisome is that content may be skewed. A corporate sponsored high-tech program on historical progress in communications at Epcot Center was unsubtly intended to "assure us that the same pattern can be extrapolated into the future, with results so impressive that they can only be hinted at by shadowy evocations." At worst, corporations (and universities for that matter) have used their ownership and sponsorship of networks and databases to

control content and control access.<sup>6</sup> If our past and present attempts to transfer history and literature into media are any indication, then these new teaching products will tend to reify in a particularly powerful way the perspective and content portrayed in them.

### Cost Issues

The relationship of investment in the technological infrastructure of campuses to the institutional support of faculties is obvious: both are competing for scarce dollars. Even Jensen admits that "the technology paradigm shift could not be happening at a worse time in academic budgets." Costs are clearly high. In my own area, speedy electronic document delivery is considered the great savior of academic libraries - and a way to provide immediate access without the costs of subscribing to and housing journals. But recent price listings from the ISI "Genuine Article" Document Delivery Service and the British Library Document Supply Centre spelled out the expense of relying on such services: copies of current and backlist journal articles faxed within 24 hours (the closest approximation of a library owning a journal) ranged from \$23.50 to a flat \$38.26 per article. Further, the "virtual library" projects of the Library of Congress have caused a continual search for enhanced revenue sources in our most important scholarly center and these future (and as yet unfunded) electronic alternatives to building and housing print collections are considered seriously as reasons not to renovate, build, or enlarge libraries.<sup>7</sup>

However, the issue for faculty goes much deeper. I have heard a Vice President for Information Technology state it quite bluntly: "Technology will be the primary means for delivering instruction." Information technologies are seen as a way to reduce dependence on faculty in instruction. EDUCOM is putting together a group to look at ways of making "instruction more effective and more efficient" through technology, which "can help students learn better at a lower cost per student" (*Chronicle of Higher Education* 7-14-93, A25). A rather low-tech example of this was provided by the provost of an eastern university who wished aloud in the pages of the *New York Times* (12-12-93, E4) that he could "substitute taped lectures for a particularly uninspired professor or reduce the classics department" with technological-

ly distributed instruction. As these new technologies are developed, along with the means to deliver them over long distances on an individual student basis, it is not a leap of imagination to conclude that administrations will want to see a return on their investments by cutting instructional costs in other areas. These media carry potential to enhance informational support of teachers, but also to replace them as well.

In conclusion, I believe there are reasons for faculty to watch carefully the development and application of instructional technologies. Faculty must insist on substantive input into decisions of investment, instructional applications, distribution of and guidelines for the technological infrastructure of their campuses. This is necessary in order to insure in the future the kind of teaching support, privacy, and academic freedom that most of us enjoy today. These new technological tools do hold very positive potential to enhance and widen our ability to bring relevant information to bear on scholarship and teaching. But like any technological development, this does not take place in a vacuum. As Langdon Winner has written, what is missing from our push to develop technology as our "National Money Pump" are questions of what "Walter Lipmann called the public philosophy - a vision of the purposes that bring us together in society in the first place.... The discussion [of technological change] should focus not only on technical features and economic payoffs, but also on aspects of social organization and long-term consequences for the quality of public life" (*Chronicle of Higher Education* 8-4-93, B1-3). I believe this focus should characterize those discussions in higher education as well. As an antidote to the hype, faculty must play a critical role in decisions about technologies in higher education. Otherwise, the advertising blitz underway will carry the day.

### **Barbara Garson**

*(summary prepared by David Iverson)*

Barbara Garson's speech used anecdotes and dialogue from her books *All the Living Day: The meaning and demeaning of routine work* and *The Electronic Sweatshop*. She began by noting that electronic monitoring has been present since computers were first introduced into the workplace. For example, in 1980 the

first time she touched a computer at a temporary job, she discovered that the number of keystrokes per hour was being counted by the company computer. Supervision was done by the machine rather than by a boss or department head roaming the room, raising the question of whether such data is private, public, or belongs to the company. Her employer took the position that the information on the employee was company data and not personal, so there was no violation of personal privacy in using electronic monitoring to count keystrokes per hour. Garson has a long history of opposing electronic monitoring, but admits that "we've had very little success in fighting electronic monitoring. Some physical health and safety things have been improved in the office. But they really want to control you and see what you are doing, and we've had very little success in [combatting] that."

She related one rare example of successfully combatting electronic monitoring in the workplace which she has written about in her books:

There was a young woman who early on loved computers. She had a B.A. in literature, and she saw an ad for a proofreader in an accounting firm. She applied and got the job and found herself reading long columns of figures, in the days before word processing. Eventually the word processors arrived (they were Wangs) and she was very excited. She learned to be a word processor and she loved it. She was typing and editing reports and figures, and staying late to do them. After a little while, the company brought in keystroke counting. Suddenly she finds her keystrokes are being counted. The machine now listed for each report generated, and each time the report was edited: 1) the name of the report; the date it was created; 2) the person who created it; 3) the number of keystrokes; 4) the number of pages; and 5) the amount of time worked. So, for example, a typical report might have listed the following: 20,000 keystrokes, 20 pages, 120 minutes. The young woman in this story abhorred this and felt that it was absolutely humiliating...

What did she do? The Wang machine had a function

called Supercopy. You could open another document. She would open another document, copy the 20,000 keystroke document into another, then delete the old document and print out the new one. That maneuver took a few keystrokes and could be done in 30 seconds. So now the report would say: 20,000 keystrokes, 20 pages, 30 seconds. She taught that to everybody in the place and everything came in in 30 seconds. They did that for one week, and in that place in that unit, keystroke counting was taken away.

Garson has found that "66% of employees were electronically monitored by 1985," and added that electronic monitoring becomes a question of "Are you plugging in on your own, or are you being plugged in when you don't want to be plugged in?" She went on to discuss work environments and networking:

In fact, personal computers came into the workplace largely through people bringing them into the office. VisiCalc, the original spreadsheet program, was designed for this sort of non-networked computer. They weren't networked into anything and weren't authorized. They were sometimes bought out of the money for typewriters. Immediately the personal computer [was pushed] in the other direction in the office through networks. While there is much to be gained by some networking, not everything has to be networked to everything else in a configuration where everybody can be monitored. So it really is a question of who's using it and which way the data flows. You've got this super connection all over the world and like every other technology in the world, it really depends on who controls it.... Monitoring turns out to be the key variable predictor of physical illnesses at work.

Garson concluded her talk by mentioning that, as a member of the National Writers' Union, she is involved with one of the first lawsuits on electronic copyright. They are seeking to answer the question, "Does the newspaper that buys my article automatically control all electronic publishing rights too? The publishers say yes and have been selling my work to Nexis without my permission and without paying me."

### Lance Rose

(summary prepared by David Iverson)

Lance Rose, of the Electronic Frontier Foundation, began his talk by asking, "Is a writer's market dependent upon the number of [electronic] rights or the number of writers?" as a prelude to talking about competition with publishers through electronic and desktop publishing. Electronic services is a wide-open field, but is it fair to ask for more money because something is published electronically? He characterized the issue as freedom of speech, electronically speaking. Rose, who described himself as a computer lawyer, went on to talk about three pending court cases which pertain to this topic:

The *Newsday* case, taking place in the Southern District of New York, Manhattan Court, is a "virtual reality" case involving the alleged stealing of electronic material by *Newsday*.

Frank Music v. CompuServe involves preservation and copyright of electronic media, specifically the uploading/downloading of files, including items where there might be copyright infringement.

*Playboy* v. Tech Warehouse is another copyright infringement case involving digital images, copyright and the electronic transfer of information.

He discussed in brief a number of groups involved with electronic rights:

Electronic Frontier Foundation, founded by Mitch Kapor and John H. Barlow, is concerned with exploring civil rights in an electronic environment and forming a national information infrastructure involving protocol, rates to be charged, etc.

The Society for Electronic Access (for which he is the contact person), Computer Professionals for Social Responsibility, the Center for Media Education, and the Center for Civil Networking were mentioned.

The Taxpayer Asset Project (TAP) is a Ralph Nader project (with Jamie Love as the contact person). The idea behind this group is that public information — both paper and electronic — are assets of the taxpayer, and two examples of how TAP puts this idea into practice were given. The first involves the

EDGAR database. This is an SEC database of company filings by publicly-held companies which was controlled by Mead Data Central for a profit. TAP asked, "Why is Mead Data Central making all the money off of this?" Put another way, "why is a private company making a profit off of public information?" Because of TAP's inquiry into this, Mead Data Central's control of this database is on the way out. Similarly, the JURIS database, a database of legal materials used by the Justice Department, is controlled by WESTLAW. If the information in JURIS were public, it would compete with expensive databases like WESTLAW and LEXIS. The Justice Department decided that JURIS would be controlled by WESTLAW and that they would buy information on JURIS from WESTLAW just like everyone else. TAP is investigating this situation as well. The group is also looking at the antitrust aspects of mergers between large media/entertainment agencies, out of an anti-Big Brother fear of a few large companies controlling everything. One of TAP's more notable accomplishments was blowing the whistle on Information Industry Association and the National Archives Database.

Rose concluded his talk by highlighting a national discussion about encryption of electronic messages. The idea behind this is to keep the networks free without undo or unwanted monitoring by the government. The encryption of texts and messages always defeats an attempt to invade one's electronic privacy. However, the federal government wants to retain and expand their ability to monitor these transmissions by way of the "Clipper" chip. Essentially, Clipper would provide an algorithmic key to any encrypted message if the chip were installed in your computer. The government wants to mandate the manufacturing and installation of these chips and possibly make electronic access to government information available only through Clipper. This is also proposed for sales of computers overseas. Rose mentioned the Cantwell Bill is an anti-Clipper measure sponsored by software publishers to relax National Security Agency (NSA) import restrictions on software to deflect potential market share loss posed by Clipper, which would not require NSA approval.

*Reports on Garson's and Rose's presentations were prepared by David S. Iversen, Assistant Professor - Librarian, Rider University, from a tape made by Our Common Interest, R.R. 3, Box 319-A, Monroe, NY 10950.*

### Notes

1. See my own chapter on Issues in Censorship and Information Technology in *Critical Approaches to Information Technology in Librarianship*, ed. John Buschman, Greenwood Press, 1993 for background information.
2. See *ibid.* and Carolyn Gray's chapter as well; and John Markoff, *Cyberspace Under Lock and Key*, *New York Times*, 2-13-94, E3.
3. See Karen DeWitt. Battle to Save U.S. Files From the Delete Button, *New York Times*, 4-11-93, N13; Evan St. Lifer and Michael Rogers, Conduct of U.S. Archivist Under Scrutiny in Bush Deal, *Library Journal*, 3-15-93, 14-15; Page Miller, Insuring the Preservation of Electronic Records, *Chronicle of Higher Education*, 2-3-93, A44; Jodi Daynard, Floppy Disks Are Only Knowledge, But Manuscripts Are Wisdom, *New York Times Book Review*, 3-28-93, 27; and Lawrence Fisher, Memories Linger, but the Tapes Fade, *New York Times*, 11-28-93, F9.
4. Kenneth Janda, Multimedia in Political Science: Sobering Lessons from a Teaching Experiment, *Journal of Educational Multimedia and Hypermedia*, 1992: 341-54.
5. Quotes are from the respective sources noted below. For very recent discussions of these points, see Rand Richards Cooper, Can We Really Read With Our Ears?, *New York Times Book Review*, 6-6-93, 15, 49; and Daniel J. Walkowitz, Telling the Story: The Media, the Public, and American History, *Perspectives: The Newsletter of the American Historical Association*, 10-93, 1, 6-9.
6. Quote from Russell Mills, Science and Technology as Show business, paper presented at the New England American Studies Association Conference, 1993; see also my own edited book noted earlier.
7. The ISI price information came in a February 1994 mailing, and the British Library document pricing information was contained in a November 1993 mailing to libraries. Other relevant sources include my own article co-authored with Michael Carbone, A Critical Inquiry into Librarianship, *Library Quarterly*, January 1991, 15-40; Karen De Witt, The Nation's Library, for a Fee and a Modem, *New York Times*, 1-28-93, E16; and Bitnet communications on the LIBADMIN listserv from Bernie Sloan (5-13-93) and James Rettig (5-14-93).