Where Will All the Teachers Go?

Peter J. Denning

George Mason University

pjd@gmu.edu

DRAFT 1/19/98
FINAL 5/98

This article was published in Educom Review, May 1998, pages 30-34, under the title "Skewering the Prototype". It was one of several commentaries on David Noble's article "Digital Diploma Mills: The Automation of Higher Education."

It was in 1964, I think, when I first saw the now-famous *New Yorker* cartoon of a classroom of the future. The picture shows a tape recorder on each student's desk and a tape player on the teacher's table. The machines whir quietly -- and no one is in the room. Thus did the cartoonist skewer the stereotype of the classroom as a venue for transmitting information from teacher's store of knowledge to student's notebook. Today, with TV classrooms holding the stereotype for distance education, the cartoonist might render the scene as a virtual classroom populated with a camcorder and VCRs. In five years, the same cartoonist might add a new machine, a tester that certifies when a student machine has learned its lessons from the teacher machine. As in the original, the machines whir, and no one is present.

These scenes give images for David Noble's concern: that at some point computers and networks will automate all the jobs now typical of school -- lecturing, note-taking, testing, and record-keeping. Noble is not alone in this concern. Many faculty find the scenarios plausible and worry that their personal futures will be as barren as this picture. Although Noble is almost exclusively concerned with how such a future might leave faculty without jobs, you don't have to be a faculty member to appreciate that something is profoundly unsatisfactory with this scene. It seems to be the logical conclusion of current trends, and yet it makes no sense. What is wrong with this picture?

Noble describes the world behind this picture with a complex set of claims and assumptions supported by facts that make them plausible. He embeds his picture into a conspiratorial tapestry: predatory university administrators (and their profit-hungry corporate partners) on the one side, the student and faculty prey on the other. Because the tapestry as a whole has a visceral resonance to many faculty, it needs to be taken seriously. It cannot be ignored, but it can be refuted. An examination of each major strand of the weave leads to serious doubts about its veracity. Why the tapestry unravels reveals what is wrong with the cartoonist's picture.

In the paragraphs following, I grouped Noble's seven main claims into two main categories, and I preserved some of his phraseology to illustrate the conspiracy theory he advances as part of his hypothesis.

The first category concerns actions and motivations of university administrators. In the name of cost effectiveness, administrators aim to reduce faculty autonomy and independence, to deprive them of control over their own work, to monitor their work through electronic surveillance, and to appropriate their intellectual property (course content).

The process by which administrators have engaged these aims has been going on quietly since the 1970s. At the beginning, they focused on commercialization of research products, mostly through patents and licenses. (The revised patent law in the early 1980s accelerated the process, sparking a major reallocation of resources to research and marking the relentless rise of tuitions.) Recently administrators gradually shifted to commercializing educational content, mostly through copyrights, intellectual property claims, videos, CDROMS, and Web sites. Administrators have had important allies in the project to commoditize educational content: commercial vendors (hardware, software, content-providers), corporate human resource people (who see opportunities to exploit public funds to satisfy their training needs), and techno-zealots (who love technology for its own sake).

Universities are, as you can see, already far along in their plans to automate professors' work; the process has happened slowly without giving the faculty much to say about it. It is time for faculty to be seriously concerned about this situation, for automation poses a severe threat to the values of higher education, notably faculty control of the curriculum and processes of learning, academic freedom, faculty autonomy, and quality of research, faculty, and students.

Noble's second category of claims concerns the workload associated with using computing technologies in education. By requiring programming and processing of digital content, and by opening up e-mail twenty-four hours a day, computer -based instruction places limitless demands on instructor time.

It distances the faculty from the students, who want genuine face-to-face classes, not cyber-counterfeits.

These claims seem to be organized around the notion that the world of education is being driven by technology, which must be stopped (or controlled tightly) before it undermines quality and shortchanges students. I think that a better question is the time-honored quest for curricula that help students become effective citizens and persons, taking advantage of technology to assist in this objective.

The Realities

There is too little space here to enumerate the claims and refute them individually. I will recall current realities that cast doubt on them.

Consider first the notion that university administrators are the driving force behind the movement toward more technology in education. In fact, the number of people involved is enormous. It includes politicians of all stripes (from the President, through the Executive Branches, the Congress, state and local governments); faculty from university and public school systems; business leaders from myriad companies; and parents everywhere. The agendas and interests of these groups vary widely and often conflict. To suggest that they are engaged in conspiracies or monopolistic practices stretches the meanings of these terms beyond recognition.

Behind this broad interest is the pervasive and ubiquitous Internet and personal computer. Internet users number 60,000,000, doubling every 18 months in accordance with Moore's Law. E-mail and Web addresses are routine parts of business cards, stationery, and advertising. Commerce by Internet is burgeoning. The government is redoubling its research budgets in security technologies to protect the telecommunications infrastructure. The world, not university administrators, is the source of the pressure for "Internet literacy".

Legislators have had, in many ways, a larger influence than university administrators. In 1994 and 1995, well over half the states froze or cut their higher education budgets (over strong objections of university administrators, it should be noted). Some legislatures permitted or required tuition increases to offset some of the losses. All the while, assisted by editorial writers in the press, legislators spoke frequently about their dissatisfaction with the responsiveness of modern universities to societal needs, especially those relating to workforce, economic development, and technology transfer from research to industry. Since 1995, the states have begun to restore higher education funding, but with strings attached: engage with high-technology, workforce, and technology-transfer initiatives. Many

have actively promoted “technology literacy” and hands-on training as aspects of modern curricula.

Consider next the notion that university administrators are seeking new revenue by commoditizing the research results of the faculty. Federal research budgets, especially for basic research, have been under siege for most of the 1990s, despite intensive lobbying from university and research groups. Politicians have openly expressed their dissatisfaction with return on investment for federal dollars in university research. They have strongly encouraged universities to form alliances with businesses as a way to pursue research agendas and have rechanneled research funds into mission-oriented programs. To the extent that universities are successful in selling licenses or receiving royalties with patents, they have plowed the revenues back into supporting the university research program.

In fact, the very notion that university administrators have an animus against faculty is itself hard to accept. Most universities administrators, especially the key decision-makers such as presidents, vice presidents, provosts, deans, and department chairs, *are* faculty. They have home departments, they teach courses, and they advise students. It’s hard to believe that these people don’t appreciate, respect, and look out for the interests of faculty and students -- that they would switch from being friends of their colleagues to enemies on taking their administrative posts.

The notion that the faculty are feeling forced to use digital technologies for teaching is likewise hard to accept. In my experience, it is often the other way around. Many faculty are annoyed that their administrations have not moved fast enough to support technology in education -- with their students, they complain about too few dial-in lines, inadequate bandwidth, inadequate server capacity, too little technical support, too little Web page design support, inadequate reward systems, too little training in use of the technologies, and the like. Resource-strapped administrators have found it hard to respond at the pace the faculty would like. A widening group of faculty are engaged in experiments to find the effective mixes of technology, practice, and plain old tender loving care of their students.

Despite operational difficulties, large numbers of faculty routinely use e-mail to increase the number of hours they are available to answer student questions; they use web pages as distribution centers for class policies, handouts, homework assignments, and other course materials; they provide software packages for their students to use as tools. This has happened without coercion by their department chairs and deans and without modification of the “reward system”.

Should the faculty just sit back, as Noble suggests, and take their time sorting out all the issues brought to the fore by digital technology? I think not. There

are some significant changes taking place in the world that no faculty can ignore. In his best-selling book, *School's Out* (Avon, 1992), Lewis Perelman gives a vision of how people will learn in a world dominated by information technologies, where work and learning are intimately connected. Many aspects of that vision -- certification, learning on demand, self-pacing, access to recorded lectures, simulations, virtual realities, chat rooms, project groups, location-independent access, richly hyperlinked resources -- are already realities. For those who don't want classrooms, there is a growing number of commercial "virtual universities" available via Internet. For those who want their skills certified, there are numerous companies offering training and certification programs. For those who want the best presentations, there are companies that scout out the best teachers and sell their recorded lectures on audio and video tapes. Perelman believes that many universities lack the inclination or institutional ability to compete in the new markets for education. He says that the "virtual university" is like the "iron horse" -- not a new kind of university, but a replacement.

This vision is supported by changing demographics. At many universities, large majorities of graduate students are employed and take classes part time. Significant minorities of undergraduates are also part-time and employed. These people welcome the use of technology that would relieve their commutes to campus and reduce time off work.

Finally, there is growing evidence that the Internet is shattering the old notion that technology increases the control of the institution over the individual. More than a few historians and economists have wondered openly whether the nation-state and other institutions can survive in a world where information, money, and transactions can flow across boundaries almost without impediment. The Internet is weakening the power of large organizations and governments. The US federal government, wanting the Internet to be a "tax-free zone", finds itself pitted against the individual states. Law enforcers are stymied by crimes committed remotely from outside their jurisdictions. Individualism and entrepreneurship are on the rise in the US. Many futurists expect these trends to sweep the rest of the world in the backwash of the Internet.

The New University

These trends and new realities paint a picture of expectations on public universities that differ markedly from those of a generation ago. We live in an age of the individual, an entrepreneurial age powered by the Internet. There are broad public expectations that universities should prepare their graduates for employment and help them maintain professional currency after graduation. There is a broad sense that a well-educated workforce is

economically competitive in world markets. The horizon of education does not end at age 25, but continues through a person's career into retirement.

These broad trends have created a rich set of new opportunities for universities in research, professional education, and teaching. I will only summarize here what I have said at length elsewhere (*Educom Review*, November 1996).

In research, faculty are beginning to realize that there are at least two other approaches to innovation besides generation of ideas. These are teaching of innovative practices and creation of products that enable new practices. A university's portfolio of research can now be broadened to include research that assists companies develop products. Broadened research portfolios will expand the ways in which faculty's creative energies can be harnessed and will enrich the range of experiences available to students. They will give access to the new federal research programs and to corporate research moneys.

In professional education, many faculty now agree with the notion that people don't stop their formal learning by age 25, the age by which universities are designed to release them. A rich new world of graduate programs is opening up, including professional certifications, professional updating, and teaching of higher levels of competence such as expert, virtuoso, and even master in selected domains. Even in the unlikely case that significant automation is achieved in many undergraduate courses, there will be plenty of work for faculty in professional and continuing education.

Teaching is perhaps the area of greatest stress for faculty. It is true that digital recordings, on-line assessment, and databases are taking over the familiar faculty roles of presenting, testing, and record-keeping. But no machine can automate the teacher's roles of inspiring, motivating, guiding, coaching, and managing students. By automating the routine parts of teaching, the technology is enabling the faculty to spend more time on the human side of their roles, and to reach more students without losing the quality of interaction. But many faculty feel disoriented because they have not been trained as coaches and managers and their institutions offer no significant development programs to help them learn; and yet at some point they will be evaluated more on the results produced by their students than on the opinions of their faculty peers. In spite of the stress, the good news for students and teachers is that learning is more than information transfer, that automation can affect at most the information-transfer part of learning, and that the teacher is indispensable.