

PRESIDENTIAL ADDRESS

Distance education: Has technology become a threat to the academy?

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Recent discussions regarding technology-assisted distance education have given rise both to enthusiastic predictions about how this form of instruction will transform higher educational institutions and to widespread fears about the threats that this technology poses to the student-teacher relationship and to the profession of university teacher in general. A review of opinions regarding distance education and computer technology in academia suggests a continuum of positions, ranging from the expectation that dramatic and even cataclysmic changes will lead to the eventual dissolution of the university to an envisioning of only minor changes in the academy's objectives and methods. In the present paper, this continuum is used as an organizing scheme to present the positions of several well-known advocates for and against the use of distance education and information technology. It is argued that the accreditation process will ultimately determine the degree to which distance education replaces traditional classroom instruction and that this process can be influenced by faculty involvement in decisions about the use of technology in the classroom.

Recent speculation about the effect that technology—particularly distance education technology—will have on the teaching profession has prompted a debate about the role of technology in the classroom and the future of the university in a technologically enhanced learning environment (Massy & Zemsky, 1995; Neal, 1998c; Noam, 1995; Postman, 1995a, 1995b). Noam (1995) and Massy and Zemsky (1995) argue that the university and its faculty will come under severe economic pressure to increase productivity—measured by courses taught and degrees granted—and that the result will be a radical transformation of the academy and the role of faculty. These arguments have been adapted and extended by others, who are often from the private sector, to include the position that the teaching function of the university will be completely replaced by “knowledge industries,” which will deliver needed “just-in-time” knowledge to workers who will have no formal university training (“Barnstorming with Lewis Perelman,” 1997; Perelman, 1993). Others believe that the teaching function of the university cannot be replaced by any existing technology because teaching involves more than simply conveying information to students. In their view, teaching is primarily the passing of culture from one generation to the next through mentoring, role modeling, socialization, guidance, individual interaction, and group activity—all of which require physical proximity (Noam, 1995; Postman, 1995a, 1995b; Rada,

1996). According to this group, technology will continue to play a role but will not replace the function of the teacher in the educational process.

In this paper, I consider these positions and suggest that the teaching role of faculty can be preserved even while technology and distance education are introduced and expanded, provided that faculty exercise their influence on the accreditation process and become more fully engaged in the decision making that controls the introduction of technology into the university.

VIEWES OF THE IMPACT OF DISTANCE EDUCATION AND TECHNOLOGY ON THE ACADEMY

An informal examination of papers related to the use of computers in teaching published over the last 10 years in *Behavior Research Methods, Instruments, & Computers*, the journal in which the proceedings of the Society for Computers in Psychology (SCiP) are published, might lead one to conclude that those who develop and use technology for classrooms have shown little interest in the long-term consequences of adopting technology except in how it has solved particular problems or aided the teaching of a particular concept or course. These articles suggest that members of the SCiP tend to be unabashed supporters of technology. The articles do not contain a single analysis of a possible “downside” to applications of technology in the teaching of psychology. Although surveys have reported analyses of the use of computers in teaching (see, e.g., Eckerman, 1991; Hornby & Anderson, 1994) and the availability of computers (see, e.g., Hornby & An-

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derson, 1994), none have considered the potential impact of computers on the profession. Of course, this is not surprising, given that SCiP's mission is to "increase and diffuse knowledge of the use of computers" in psychology. However, it is the responsibility of those who promote the use of technology to address the fears of their colleagues rationally and to assess them fairly. When we do, we may find that their fears and concerns are not unfounded.

Concerns of Faculty:

Distance Education and Virtual Universities

Many faculty and faculty organizations harbor a distrust of distance education technology. They distrust the impact of technology on the university, and they especially distrust how the technology will affect their classrooms, their interactions with students, and their job security (see, e.g., Honan, 1995; Monaghan, 1998). Many see technology as a threat. Even some administrators, including the recently appointed president of the University of Utah (a member of the Western Governors University virtual university consortium), have voiced strong disapproval of pressures to implement distance education at the expense of traditional instruction (Biemiller, 1998). These individuals are often technologically knowledgeable—not backward-looking Luddites or myopics. They are not even opposed to technology. But they do feel that the role of the teacher, and particularly the character of the student–teacher relationship, might be affected in unpredictable and mostly adverse ways by the technology.

They are particularly concerned about *distance education* or *distance learning* (these terms are commonly used interchangeably) and the *virtual university*—an entity that purports to replace the classroom-teaching and degree-granting functions of traditional universities, but that itself has no classrooms, no library, no dormitories, no student union, no performing arts center, no buildings, and few or no full-time faculty. Virtual universities made possible by distance learning technology are enrolling more and more students. An example is the Open University in the United Kingdom. It is one of 11 megauniversities that each enroll more than 100,000 students; together, these universities enroll more than 3,000,000. The Open University expects to award its 200,000th bachelor's degree this year (Daniel, 1998). Phoenix University enrolls more than 50,000 students (Leatherman, 1998). Many traditional universities are opening distance education courses, sometimes in fear of losing their students to the virtual universities (Robinson, 1997). More than half of United States colleges and universities offered distance education courses in 1995, and that number is surely larger now.

Distance education has been around for a long time. The Distance Education and Training Council, founded in 1926, reported that approximately 100 million Americans have taken distance study or correspondence courses (Robinson, 1997). Therefore, it is unlikely that these faculty are responding so much to the term *distance* in *dis-*

tance education as they are to what is meant by the term *education*.

Modern Distance Education: Synchronous and Asynchronous

Distance learning may have a long history in teaching and academia, but the power and reach of computer communication presents the vision of a change that is unparalleled in history. Modern distance education is technologically enhanced education, and it is distinctly different from the distance education represented by correspondence courses and televised lectures. It is possible to carry on synchronous instruction with full audio and video communication between a teacher and a student who are separated by thousands of miles. At Rensselaer Polytechnic Institute, students who are enrolled in "studio" classes see the instructor or other students on their computer screen. Each student's screen is synchronized to the instructor's commands to change pages, launch video or audio clips, or run animations. Although students link to a wide variety of pages and sites in their exploration of topics, the instructor's presentation of new material automatically replaces the student's screen, resynchronizing the class and "bringing back" students who have followed links to other material (Wilson, 1997a).

Using asynchronous communication, students select multimedia-based class sessions, communicate with the teacher and other students, and gain access to other course material at their own convenience. Students receive instructional material and instruction by signing on to a World-Wide Web site, where they receive readings, assignments, quizzes, and tests, and where they can ask questions of the instructor and receive answers by e-mail, fax, or telephone. Although few universities now have this technology in place, it is only a matter of time before virtual universities around the world "ramp up" to these capabilities.

Students otherwise unable to obtain an education have an opportunity to do so with this technology. In many instances, instructors and students find the experience both academically demanding and intellectually rewarding. Studies indicate that student performance in technology-based classrooms does not differ from that of students in traditional classrooms (Russell, 1998).

Advantages and Benefits of Distance Education

Many writers have examined the advantages and benefits of technology and distance education (see, e.g., Hantula, 1998; Matthews, 1998). Among the advantages and benefits commonly included are the following:

1. Students and teachers do not have to be present in a classroom in order for instruction to occur.
2. Content, as "just another form of data," can be made available at "little or no cost to the user" (Matthews, 1998, p. 50).
3. Delivery of content can be customized to the needs and schedules of the students.

4. Instructional materials tend to be based on learner outcome.
5. Distance education is inherently collaborative.
6. Competition among institutions of higher education is facilitated.
7. Courses can be made available more easily to handicapped, minority, and nontraditional students.
8. Students can exert more active control over the content, personalizing it to suit their particular needs, interests, and learning styles.
9. Content can be delivered as needed, at the site where it is required.

However, not all faculty regard these to be advantages. They ask, for example, what, if anything, is lost when students and teachers are not together in the classroom? Some critics of distance education regard one-to-one student-teacher interaction as the heart of teaching. Is instructional content just “data,” or does instruction also involve problem solving, mentoring, and acculturation? How are these conveyed in a distance education environment? Many faculty have expressed concern about how distance education and technology will affect their interactions with students and their roles as professors. For example, some York University faculty members formed picket lines and carried signs reading “Televisions don’t teach, people do” and “Clone sheep, not Internet courses” (Young, 1997). Other examples of faculty resistance and concern are cited below.

Distance Education and the “Computer as Tool” Metaphor

Castellan (1988), Butler (1988), and others have suggested that it is useful to regard the computer and computer software as tools that may be used (or abused) in the instructional process and that may be evaluated according to various criteria, such as how they display information to the student, how adequately they may be integrated into the course, and how successfully they facilitate instruction. One reviewer of this paper observed that computers “make bad teachers but great tools for learning.” Although it might be useful to consider software or an

individual distance education course in this context, my purpose here is to discuss the potential ramifications of distance learning for the academy in general, rather than to consider particular implementations. In this broader sense, distance education is not just a tool; it is a new way of doing things—indeed, a new way of thinking about education—in much the same way that Skinner’s teaching machine (Skinner, 1968) was not just a tool, but an implementation of a broad-based psychological theory that went far beyond the machine itself. My purpose here is not to evaluate distance education, but to consider some views about how it might affect the future of the university and what, if anything, we as educators can do about it.

Distance education, unlike any particular classroom-based technological innovation, gives rise to the possibility of a radical transformation of the social and intellectual role of the classroom teacher within the institution and, in some scenarios, the replacement of the teacher and the institution itself (see, e.g., “Barnstorming with Lewis Perelman,” 1997; Prowse, 1995).

Divergence of Opinion About the Impact of Technology and Distance Learning

Attitudes about the impact of technology and distance learning can be seen along the continuum shown in Figure 1. At one end are those who have concluded that the consequence of the availability of large numbers of courses supported by information technology and distance learning will result in the end of the university as we know it. At the other end are those who believe that the university will not only survive, but thrive, with or without the new technology. The former might be called *management technophiles* and the latter, *teacher advocates*, for reasons that will become clear. In the middle is a widely divergent group of those who anticipate that technology may result in changes in the university, perhaps including a shift in focus toward the university’s functions that are more closely associated with socialization, acculturation, and mentoring. This group regards technology and distance learning as useful enhancements that may ensure the survival of the university.

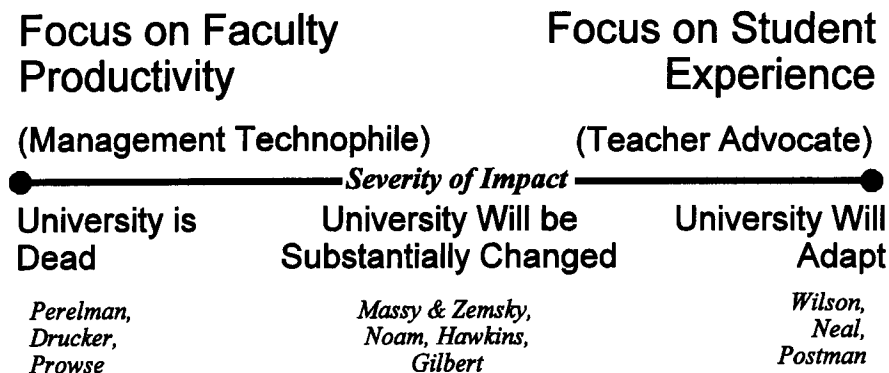


Figure 1. Continuum of attitudes about the impact of technology and distance learning.

To be sure, this continuum is an oversimplification. Views of the role and impact of distance education and technology are as varied as the individuals who possess them, and no one-dimensional representation can encompass them all. But what emerges from this attempt to locate the views of these writers along a continuum is yet another continuum paralleling the first that appears to capture a second component of their writings: the role of the faculty and the student in the educational process. To a remarkable degree, those who believe that the future of the university is bleak and that distance education and technology will ultimately replace—or become—the teacher tend to regard the student–teacher relationship as an artifact of traditional “handicraft” approaches to instruction. Those who expect that the university will continue in its current role, however, agree that one-to-one student–teacher interaction, mentoring, and socialization are essential functions of the university. Not uncommonly, writers who envision dramatic changes in the university (or its ultimate demise) also are those who most forcefully promote distance education as a “solution” to problems (real and imagined) faced by the university—that is, they see the solution to the university’s problems as its demise. However, writers who see the continuation of the university in a form much like today’s often regard distance education as suitable only for “training” and not for education (Tannenbaum, 1999). Neal (1998a) further observes that very often those who are the most forceful advocates of distance education are entrepreneurs, college administrators, or government officials who have a personal or professional stake in its promotion, whereas those who exhibit the most skepticism are more likely to be classroom teachers. The divergence of and conflict between these attitudes and observations deserves analysis.

In the following section, a sampling of authors who are at various positions along the continuum are briefly quoted in order to clarify their position and to provide a flavor of the intensity of the arguments offered.

A SELECTION OF VIEWS ABOUT THE IMPACT OF TECHNOLOGY ON THE FUTURE OF THE UNIVERSITY

From the Perspective of the Management Technophile

Management technophiles focus on productivity in the university and especially on faculty productivity. They believe that the university in its current configuration is dead.

The logic is simple. The teaching function of universities is to make knowledge available to students. The primary means of doing this in the past have been lectures and individual mentoring (handicraft education) (Noam, 1995). But such methods are labor intensive and, for that reason, very expensive. As information technologies become more and more sophisticated, it will become possible to design effective instructional materials that are entirely or nearly entirely computer based, which will be

available to students in their homes or workplaces through computer communication links. When this happens, the cost savings through economies of scale will lead to the abandonment of the expensive lecture method and its complete replacement by computer-based delivery systems, which most likely will be developed and distributed by private sector “knowledge industries.” With no need for classrooms, blackboards, or the physical props necessary to shore up the lecture, the buildings of the university, the faculty, and much of the administrative staff will become obsolete. The role of the faculty member will either disappear entirely or be so altered as to become unrecognizable. More extreme technophiles argue that what is taught in the classroom will not be relevant anyway because it will be outdated before students graduate; young people could just as well forgo formal higher education altogether. Knowledge, up to date and immediate, could be sought and obtained through distance education as needed, and just in time (“Barnstorming with Lewis Perelman,” 1997).

These analyses are based on the assumption that our society will not tolerate the continuing “inefficiencies” of the present labor-intensive higher education system. Costs of tuition are going up at a more rapid pace than is inflation, but the “product” remains the same. Increases in educational productivity are regarded as concomitant with increases in the *amount* of instructional material made available to students and with increases in the “throughput” of the instructional system.

Lewis Perelman. Among the more extreme scenarios are those presented by management consultants. Lewis Perelman, author of *School's Out* (1993) and proponent of just-in-time learning, talks about the university as being a part of the “knowledge management” business (“Barnstorming with Lewis Perelman,” 1997). Perelman said in 1997 that he believed that education was in a “metastable” situation and would experience a “systems break” within years or even months. The change, Perelman said, will be sudden, not incremental. Even virtual universities are irrelevant, according to Perelman, because they are also educational institutions that try to sell the same product: courses and diplomas. The knowledge industry should instead focus on the production of expertise, delivered just in time through computers. As a college president, he would abandon the campus buildings and “go virtual, but not go virtual just to become a more efficient diploma mill . . . but focus on what . . . the market wants, which is know-how.” Perelman further said “and probably I would drop the name university or college—because the new business . . . is not an educational institution” (“Barnstorming,” 1997, p. 25).

Attempting to reform the university is futile:

“Reform” is an evolutionary, incremental, long-term process . . . and that’s why it is a waste of time. Long before the reform of the educational system comes to any conclusion, the system itself will have collapsed. [It will] segue from bankruptcy . . . to a form of discretionary entertainment. (p. 24)

Perelman also thinks that members of the “Nintendo/PC generation”

have brains different than ours. We don’t know exactly how they are different, but there is absolutely no question that they are different. One would assume that their brains are wired in ways that are much more adaptive and facile to function in that kind of environment. (p. 22)

Peter Drucker. Peter Drucker, the well-known management expert, has reached a similar conclusion (Lenzner & Johnson, 1997). Because university costs continue to rise without visible improvement in content or quality, Drucker thinks that in 30 years universities will be relics, to be replaced by private sector competitors.

Michael Prowse. The financial media appear to be particularly enamored of this view. Michael Prowse, a feature writer for the *Financial Times*, seems almost gleeful as he skewers professors: “They are selling a product that is ridiculously expensive and ill-suited to the needs of a rapidly-changing economy” (Prowse, 1995). Following Perelman, he challenges the whole notion of academic degrees:

Higher degrees serve a function akin to that of the exotic plumage of birds: they are primarily a means of attracting attention Simple tests of cognitive ability can be administered in less than 30 minutes. Such tests . . . are a better guide to job performance than academic degrees. (p. 16)

Like Drucker, Prowse believes that universities are outdated, particularly in their belief that the accumulation of a stock of knowledge serves a worthwhile purpose for succeeding in life:

But in a rapidly changing world this is inefficient. . . . The better strategy is to wait until we need particular knowledge or skills and then obtain them electronically. . . . people would not spend years preparing for employment. They would begin work early—perhaps in their mid-teens. (p. 16)

Of course, it is employers, not college professors, who demand that employees have some stock of knowledge. And that is a good thing; on what other basis would one decide what sort of “particular knowledge or skills” is appropriate for solving a problem? If the problem-solving and decision-making literature in psychology has taught us anything, it is that we must have a basic store of knowledge before we can know what information we need in order to solve the immediate problem before us (see, e.g., De Groot, 1965; Reitman, 1976).

Conclusion. Management technophiles assume that (1) it is useful and appropriate to regard universities as “knowledge industries” whose primary function is the transmission of knowledge to students; (2) as currently configured for this task, universities are inefficient and outmoded, largely because their faculties are inefficient and have not improved their productivity and much of what faculties have to offer is useless or obsolete by the time students graduate anyway; (3) the rapid expansion

of information technology (IT) will enable marketplace challenges to universities from a private sector knowledge industry, to which universities will be unable to respond; and therefore, (4) the university in its present form will cease to exist. Underlying these assumptions is the further assumption that it makes sense to analyze the university using the techniques developed for analysis of private sector for-profit enterprises.

Moderate Views:

The University Will Be Substantially Changed

Writers in the middle of the continuum differ from management technophiles in that they generally agree that the knowledge obtained in the university is worthwhile. They accept that the problems that the academy faces are economic. Universities, as currently structured, are simply not cost effective or efficient. These writers show varying degrees of sympathy for the functions of the university that are not easily measured by “simple tests of cognitive ability.”

Massy and Zemsky. The heart of Massy and Zemsky’s (1995) analysis is their view that the survival of the academy requires an increase in its productivity. IT provides a means to increase productivity. Technology is capital; faculty is labor. Although technology might require large start-up investments, capital investment is less expensive than labor in the long run because it offers opportunities for economies of scale. The same course could be made available to thousands of students—anywhere, anytime. The incremental cost of adding students grows smaller as the number of students grows larger. Revisions, which are relatively inexpensive, would enable the course to be taught year after year. As the capital–labor ratio increases, universities will become more productive.

As Massy and Zemsky (1995) observe,

The “career” of a workstation may well be less than five years, whereas that of a professor often exceeds 30 years. Workstations don’t get tenure, and delegations are less likely to wait on the provost when particular equipment gets “laid off.” (p. 9)

Massy and Zemsky (1995) envision two scenarios that universities might adopt. In the first, a nonadaptive business-as-usual scenario, higher education institutions try to maintain their monopoly over the knowledge base, resisting the substitution of capital (IT) for labor (faculty). In this scenario, the universities “simply add IT on to their existing operations,” retaining traditional courses, academic calendars, teaching expectations, and so forth. The consequences will be that “continuing financial pressure due to state funding limits and tuition resistance will increase pressure on the core, leading to an eventual ‘meltdown,’ defined as loss of vibrancy, failure of faculty renewal” (p. 14).

Other information providers in the private sector will cherry pick the knowledge base and exploit it using IT-based delivery systems. The consequences will be different for different types of universities. The major losers

will be research-based universities, which will be at a competitive disadvantage in comparison with other higher education institutions, and undergraduate institutions, whose students will find other, cheaper sources of education delivery systems in the private sector.

In an alternative adaptive scenario, universities restructure and reengineer to adopt an IT-based perspective. "Faculty correct the research-teaching balance and work together to optimize the use of IT. . . . Teaching and learning quality and learning productivity improve" (Massy & Zemsky, 1995, p. 15). This might lead to either of two outcomes. In one, faculty remain fully employed, although redeployed, and the university prospers. In the other, the demand for educational services does not expand, so faculty employment declines in spite of the substitution of capital for labor. This would require further adjustments but would still be better than the nonadaptive scenario.

Eli Noam. In his important article "Electronics and the Dim Future of the University" (1995) Eli Noam predicts that the functions of traditional universities will be replaced as their financial base is eroded and their role in intellectual inquiry is reduced:

The ultimate providers of an electronic curriculum will not be universities . . . but rather commercial firms. Textbook publishers will establish sophisticated electronic courses taught by the most effective and prestigious lecturers . . . we may well have in the future a "McGraw-Hill University" awarding degrees or certificates, just as today some companies offer in-house degree programs. . . . It is likely that commercial publishers will assemble an effective and even updated teaching package, making the traditional curriculum at universities look dull by comparison, just as "Sesame Street" has raised the expectations of pupils for a lively instructional style. (p. 248)

The success of the McGraw-Hill Universities will depend on whether their programs are valued by the students whom they serve, by the employers of those students, and by society. And they are working hard to be successful. Videos featuring the "Greatest Lectures by America's Superstar Teachers" are available, distributed by a company advertising itself as "your private university, staffed exclusively by a 'dream team' of America's best lecture professors" (Noam, 1995, p. 248).

Like Massy and Zemsky (1995), and unlike the management technophiles, Noam (1995) appreciates the university and sees opportunity for corrective change that will preserve it:

True teaching and learning are about more than information and its transmission. Education is based on mentoring, internalization, identification, role modeling, guidance, socialization, interaction, and group activity. In these processes, physical proximity plays an important role. Thus, the strength of the future university lies less in pure information and more in college as a community; less in wholesale lecture, and more in individual tutorial; less in Cyber-U and more in Goodbye-Mr.-Chips College.

Technology would augment, not substitute, and provide new tools for strengthening community on campus. (p. 249)

Brian Hawkins. Brian Hawkins is president and CEO of EDUCAUSE, a nonprofit group that promotes IT in education. He views distance learning as most important in training, but he believes that schools that adopt distance learning as a source of income are naive. He also believes that distance learning courses should be consistent with the mission of the school (Talking with Brian Hawkins, 1998). He does not expect the demise of the residential college within the next 50 years, but he does expect the number of schools to shrink considerably. Hawkins thinks that the bachelor's degree will remain as the goal of students, but his predicted future is not one in which "everybody takes 28 courses on line and that's a college education for everybody" (p. 21).

Steven W. Gilbert. Steven Gilbert is Director, Technology Projects, at the American Association for Higher Education. He also runs AAHESGIT, an Internet discussion group with more than 6,500 subscribers. Gilbert believes that IT will transform teaching and learning, but he is not an uncritical advocate. He observes that no form of distance education or technology has proven so much more effective or less expensive than traditional teaching as to become a complete replacement for it (Gilbert, 1996).

Gilbert's commentary on his discussion list consistently acknowledges that faculty-student interactions form a critical part of the educational experience, and although he continues to promote IT and distance education, he does so with the understanding of a teacher committed to student learning. He does not support change for the sake of accommodating technological developments.

Conclusion. Views in the middle of the continuum range widely. They commonly assume that productivity is a legitimate and important criterion by which to evaluate universities and university faculty; IT can improve productivity; and, because of their greater efficiencies, private sector knowledge providers will threaten the present near monopoly of academia in the knowledge industry. Yet although the consequences of these threats may be serious, they are ameliorated by the recognition that the proper role of faculty goes beyond simply conveying information to students; and therefore, it is possible for the academy to stake out a central position that will enable it to continue into the future, even if it is substantially altered.

From the Perspective of the Teacher Advocate

Teacher advocates challenge the dismal future predicted by the management technophiles and believe that moderates overstate the case. They believe that universities provide a valuable period of socialization for young people—when the values of the culture are passed to a new generation—and they believe that technology cannot and will not provide a substitute for personal student-

teacher interaction (Rada, 1996). Society places great value on the mentoring and acculturation functions of the university and is unlikely to allow universities or a knowledge industry to ignore them. Further, universities represent a huge current investment that will not be abandoned easily. The university can and will change, but not disappear; faculty will accommodate and even embrace technology and distance education but not give up their core values, because society will continue to demand that universities provide them. Some teacher advocates welcome technology, but they want to be the masters of it, deciding when, where, for what purposes, and under what circumstances the technology is used.

Jack Wilson. Jack Wilson is dean of Continuing and Undergraduate Education at Rensselaer Polytechnic Institute, whose studio courses I have described above. One of the primary reasons why these courses are successful, Wilson says, is precisely that they provide an experience similar to that of a real classroom (Wilson, 1997a).

The oft-expressed fears that the one great teacher of economics, psychology or physics will teach all the classes in the respective discipline or that a Web site could somehow replace an educated professor, profoundly misunderstands the way people learn. Learning is about a "conversation" amidst resources. . . . It may be the end of "teaching," but it is far from the end of learning at the university. (Wilson, 1997b, p.15)

Ed Neal. The Director of faculty development at the Center for Teaching and Learning of the University of North Carolina, Chapel Hill, Ed Neal objects to forcing technology upon faculty. Faculty are slow to adopt new technology simply because they are not convinced that using it will improve students' learning, and they are put off by the stridency of advocates of technology and distance learning:

"Adopt now, or die!" seems to be the prevalent sentiment. . . . many of those who are urging the immediate adoption of technology are not teachers, but people with a professional stake in the outcome, such as software developers or college administrators who believe that technology will allow more students to be educated for the same amount of money. (Neal, 1998c, p. B5)

According to Neal, research on student outcomes often focuses on the students' reactions to the technology (students like it) or on secondary characteristics (students worked in small groups), rather than on basic questions such as "What did the students learn, and how well did they learn it? Did they simply acquire factual information, or did they learn to analyze, synthesize, and exercise critical judgement about the subject matter?"

Neil Postman. Neil Postman has been one of the most persistent critics of attempts to substitute technology for teaching in the classroom. His book *Technopoly* (1993) is an attack on the "disintegrative power" of technology in control of society. In it, he says that school is the "principle instrument for correcting mistakes and for addressing

problems that mystify and paralyze other social institutions" (p. 185). Elsewhere, he says that

The role that the new technology should play in schools . . . is something that needs to be discussed without the hyperactive fantasies of cheerleaders. . . . Schools are not now and have never been largely about getting information to children. . . . The goal of giving people greater access to more information faster, more conveniently, and in more diverse forms was . . . largely solved, so that for almost a hundred years there has been more information available to the young outside the school than inside. That fact did not make the schools obsolete, nor does it now make them obsolete. (Postman, 1995b, p. 378)

Conclusion. Teacher advocates reject the argument that the for-profit business model should be applied to the university and often reject the appropriateness of "knowledge as product" measures of productivity (e.g., number of courses or students taught) as criteria by which universities should be measured. They assume that universities serve a role beyond just conveying information to students, including socialization, acculturation, and mentoring; society values these functions beyond "efficiency" as measured by private sector institutions, and society will measure the effectiveness of universities, not the private sector alone; and one-to-one student-teacher interaction is central to the inculcation of these values and goals, to the instructional process in general.

WHO'S IN CHARGE HERE?

The preceding snippets represent widely ranging attitudes about the role of technology and the possible impact of distance education on the academy. The factors that will determine the future role of distance education and technology in the academy will depend in large part on the relative influence of teachers and their students in comparison with the influence of private sector initiatives that are based on quite different assumptions. In this context, it is useful to examine who is pressing for the introduction of IT in the classroom and what agencies exert control over them.

Sources of the Push for IT and Distance Education

Neal's observation that many of those who most forcefully encourage the adoption of technology in the classroom are not themselves classroom teachers suggests an examination of the sources of the push for technology. What is their interest in pressing technology into the classroom? What other sources of push can be identified?

Four groups supporting the introduction of technology were discussed in the Task Force on Technology in Higher Education's (1995) report to the American Federation of Teachers.

Students. Students commonly come to the university with considerable experience with computers; many of them own their own computers. They know that computer skills will be important, if not required, for their careers,

and they expect to be provided with access to computers and with hands-on training in using them. Nontraditional students, who often live off campus and work during much of the day when regular classes are offered, are seeking to upgrade their education through distance education. They need distance education technology in order to accommodate the course work into their busy schedules.

Even students on campus frequently prefer to take distance education courses rather than to sit in the classroom. For example, of the 609 students enrolled in the University of Colorado's distance education courses, more than 500 were taking regular classroom courses as well (Guernsey, 1998). Some students also think that distance education courses will be easier than classroom courses.

The private sector. As Neal suggests, one of the main sources of the push for more technology in education comes from the private sector. Colleges and universities are not likely to be successful in the development and marketing of commercial course material because they have little experience in private sector enterprise, and they tend to react too slowly to the market.

Privately owned virtual universities, however, stand to benefit immediately from increasing enrollments in their courses. Commercial technology-producing interests—hardware and software producers, on-line communications firms—are trying to open wedges into what promises to become a huge market. They offer incentives and bargain basement “academic” pricing on many of their products to universities. They know that a professor's choice of software very commonly becomes preferred or even required software for his or her students. Businesses also want universities to provide students with experience using software and, in general, to become technologically proficient.

College administrators. As pressure from legislatures to reduce costs and increase efficiency intensifies, administrators sometimes see technology as a way out of the money crunch. The chancellor of the University of Maryland system argued for the elimination of regulations that stipulate faculty involvement in teaching distance education courses (Committee C on College and University Teaching, Research, and Publication of the American Association of University Professors, 1996).

Some think that faculty productivity increases made possible by the infusion of distance education technology might provide tantalizing increases in instructional “yield” (Robinson, 1997). In addition, a common response of administrators is to implement management practices derived from business—for example, from total quality management. A particularly pernicious manifestation of such intrusion of management techniques into the academic environment is the “student as customer” metaphor, in which the student's preferences are allowed to determine what constitutes adequate faculty performance.

A major concern of many faculty is that administrators, perhaps operating at a system-wide or statewide level, will covertly set in place new technologies without public discussion or faculty involvement.

Faculty. College professors are among the most sophisticated computer users in the world. The number using computers for research, computation, e-mail, classroom software, and multimedia continues to grow at a very rapid rate. Many faculty have experience not only in using the software but in creating it. Almost all universities provide their faculty free access to the Internet; the number of messages delivered per month may exceed 15,000,000 (Task Force on Technology in Higher Education, 1995). An annual survey of campus computer use in 1996–1997 revealed that 32.8% of all college courses use e-mail, and 24.8% of all classes draw on resources available on the Internet. Some form of multimedia resources is used in 13.4% of all college courses (Green, 1997).

Add to these reasons the highly critical assessments of faculty and faculty workloads, such as the recently reported statements by James F. Carlin, chairman of the Massachusetts Board of Higher Education, that “professors should teach more than 12 hours a week,” that “meaningless research should be banned,” and that 50% of research outside the hard sciences is “a lot of foolishness.” Carlin was also reported to have said that tenure was “an absolute scam” that turns faculty jobs into sinecures, as well as increases tuition costs (“A Take-No-Prisoners Approach,” 1997).

These views add to the pressure to increase faculty productivity, particularly to increase the number of student “customers” for each faculty member. Distance education may appear to be a relatively inexpensive alternative to a faculty member in every classroom.

Accreditation

Whatever students find on the Internet outside their academic endeavors, the information they are presented for instruction should be appropriate and relevant to the subjects for which the students will later claim credit. The degree should be real evidence of accomplishment, not something purchased with money and with no intellectual effort.

Accreditation bestows on institutions the acknowledgment that the college awarding the degree is responsible, that the course of study meets certain minimal expectations, and that those who graduate can be expected to perform at a level comparable to those who have graduated from other institutions that offer similarly named degrees. Relatively few accreditation agencies have achieved the level of distinction that enables graduates from institutions endorsed by them to present their credentials to nearly any employer with assured approval. Preeminent among those that do meet this standard is The North Central Association of Colleges and Schools.

Universities undergo accreditation examinations on a regular basis. A university undergoing examination is visited by a group of faculty members and other experts from outside that university who examines the academic preparation of the faculty, degree requirements, course content, facilities, and student achievement, among other factors, and renders its judgment.

Government bodies usually insist that all government-supported institutions meet the accreditation standards of the appropriate accreditation agencies. Failure to do so may result in funding cutbacks or even elimination of the suspect programs. Federal student loans are available only for attendance at accredited schools (Robinson, 1997).

Accreditation, then, is the key, not only to the students who are graduates of the university, but also to the financial support of investors in private universities, including virtual universities. Although many distance education programs have received accreditation, the issue continues to be a focus of debate.

The North Central Association of Colleges and Schools issued a set of "Guidelines for Distance Education" that includes specifications regarding curriculum and instruction, evaluation and assessment, library and learning resources, student services, and facilities and finance. According to some observers, the lack of libraries was the Achilles heel of distance education (Robinson, 1997).

The Key to the Future

Just as accreditation is the key to the financial future of virtual universities, the key to the future of residential colleges and their faculty is the extent of faculty involvement and control of the use of technology. In most instances, faculty are instrumental in determining the course offerings, requirements for majors, and course content. But faculty governing bodies have rarely acted to ensure that faculty members who represent a diversity of views are involved in decision making about technology. Commonly, computer (or technology) advisory committees are made up almost entirely of technology enthusiasts (Neal, 1998b).

The American Association of University Professors insists that technology be used to "enhance the flexibility of teaching and to free both students and teachers to communicate with each other when it is most useful and appropriate, not to put further barriers between students and learning and to make the experience more impersonal" (Committee C on College and University Teaching, Research, and Publication of the American Association of University Professors, 1996, p. 67).

The recommendations of the American Federation of Teacher's Higher Education Program and Policy Council provide a blueprint and a call to action for ensuring that technology and distance education are appropriately implemented. Most crucially, the faculty must become involved in technology issues, including assessing the costs and benefits of major technological purchases; providing access and training in new technologies; maintaining educational quality; controlling workload, compensation, jurisdiction, and staff levels; and protecting intellectual property rights (Task Force on Technology in Higher Education, 1995).

In order for this to happen, campuses must have an open process for making decisions about technology. Four key questions should form the basis for all decision's regard-

ing the introduction of technology, and faculty must be involved in each.

First, does the technology make sense educationally? With some exceptions, research on technology suggests that there is no significant difference between classes taught using technology and classes taught using traditional methods (Russell, 1998). To the extent that quality of education depends on a richness of personal communication, distance education should not supplant traditional classroom student-teacher interactions. Faculties must retain responsibility for and control over the instruction provided by any mode of distance education. The amount of credit awarded, transfer credits, and other curriculum decisions must be made by faculty who review and evaluate the courses through the customary procedures at the institution. Distance learning courses should be taught only by faculty who are appointed and evaluated through a traditional consultative process with the relevant department's faculty. Such courses should include substantial student-faculty and student-student interaction. In-person meetings should be possible; e-mail communication should be a minimum requirement. Distance education should be offered only when campus-based courses are impractical—for example, when students are unable to reach campus, or when equivalent courses are unavailable on campus. Only a limited number of credits toward the degree should be awarded for distance education courses. While distance education courses have their place, they should not be allowed to entirely supplant campus-based instruction: "All of our experience as educators tells us that teaching and learning in the shared human spaces of a campus are essential to the undergraduate experience and cannot be compromised too greatly without rendering the education unacceptable" (Task Force, 1995, p. 16).

Second, does the technology make sense financially? Is there a realistic cost-benefit analysis? Technology is not likely to increase productivity that is measured by dollar savings, at least in the near term. The cost of developing multimedia materials can be staggering. One of the most consistent findings of studies of the responses of administrators to technology and distance education is that they vastly underestimate the costs (Green, 1997). By one estimate, it takes 300 hours to create a single hour of multimedia instructional material. Just to move a course to the World-Wide Web is estimated to take 18 hours of effort for each hour of instruction (Boettcher, 1998). The cost of courseware development is estimated to be about \$50,000 per hour of instruction, or about \$3,000,000 per course (Twigg, 1996). What instructional improvement could be anticipated if that money were directed to other instructional support? The cost of technology goes far beyond its purchase price. Hardware may become obsolete within a few years and must be replaced. Well-developed distance education support includes not only computers and line costs, but also switching centers, dedicated studios, control rooms, and media storage. Unfortunately,

most campuses still buy this equipment on an ad hoc basis, which further compounds the problem.

Third, will all students and faculty have access to the new technology and know how to use it? Substantial inequities exist in the distribution of technology. Both students and faculty should have access to appropriate technology, as well as to training in its use. But they should not be forced to use it, nor should their choice not to use it affect their continuing employment possibilities or salaries. Those who do choose to use the technology should have access to training programs.

Finally, are the rights of the faculty and professional staff protected? Too often, distance learning programs exist on the margins of the curriculum. They are frequently developed on an experimental basis by part-time or adjunct faculty. These instructors need to be brought into the regular curricular assignment process. Faculty control over course content and credits awarded should be maintained for distance education courses. This control should provide for class size limitations for distance learning courses; workload credit adjustments for faculty engaged in distance learning, including adjustments for preparation time, office hours, and so forth; faculty control of all grading and examinations for their distance education courses; special pay arrangements for telecourses, which take a great deal of time to develop; faculty rights, negotiated in advance, to the materials they develop for distance education and telecourses (a particularly tricky issue, because often the development of such courses requires considerable expense by the institution, which then may lay claim to the product); and more credit for the development of technology-related materials in tenure and promotion evaluations.

SUMMARY AND CONCLUSIONS

Distance learning plays a significant, growing role in higher education. The effect that this technology will have on the university is uncertain and the source of much speculation and concern. Views about the future of the university vary widely. Management technophiles believe that the university will be replaced by more efficient private sector knowledge industries using just-in-time information delivery. Teacher advocates argue that teaching is much more than the presentation of knowledge and requires individual student-teacher interactions; they believe that the socialization and acculturation functions of the university will ensure that society demands its preservation.

Many faculty members feel that the way they teach, as well as their very jobs, are threatened. Accreditation is the key that will determine the extent to which private sector knowledge industries replace the teaching function of the universities. Faculty members must become involved in the decision-making process that controls the introduction of technology and distance education in order to ensure the quality of instruction. We must focus

the attention of administrators, other faculty members, and the public on questions regarding how, when, and under what circumstances distance education technology may be introduced and what consequences might follow its introduction.

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