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The Impact of Technology on U. S. Higher Education: A Philosophical Approach

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Abstract

U. S. colleges and universities are increasingly investing in technology to upgrade their technology infrastructure and to develop or refine their distance education programs. This large increase in university budgets is justified, more often than not, by a market-driven rationale. This article asserts that a more foundational rationale should determine this investment-the institution's philosophy of education. An interpretation of John Dewey's philosophy of education is offered as an example of holistic education that integrates the best elements of late 20th century Neo-Traditionalism and Neo-Progressivism and addresses the U. S. transition from an industrial society to an information society. Four policy implications are offered to insure higher education's continued relevance in this era.

Keywords: technology, philosophy of education, higher education, John Dewey

Introduction

Fast-paced cultural changes in the closing decades of this century have forced higher education in the United States into a period of introspection. This introspection is not new, nor are cultural challenges new for higher education. This century has been marked by periodic cultural concerns about the nature of the academy. There are, however, elements of current challenges that are new, the most notable of which is the impact of new technologies on U. S. culture.

Despite rhetoric to the contrary all too often technology is viewed in primarily instrumentalist and economic terms. Attempts at engaging the deeper philosophical dimensions of technology are deemed the province of theoretical scientists and philosophers, or they become a strategic economic planning decision on the part of university administration. The argument expressed in this essay is that the exponential growth and impact of technology on U. S. culture over the past few decades compels educational institutions to reflect upon their foundational purpose—their philosophy of education.

Computer and telecommunication technologies have been the more remarkable and transformative of the new technologies emerging over the past 30 years. Not surprisingly, Internet historians claim that this technological revolution also has social and commercial dimensions (Leiner, et. al., 1998). One has only to scan contemporary media to view the rapid

move "online" of most social institutions. Not only are individuals and corporations increasingly online, but also governmental agencies, libraries, and many other organizations are connected as well.

U. S. colleges and universities are investing in these new technologies for four primary reasons. First, there is the vague fear that unless they invest in technology they will be left behind. Students expect the university to be up to date with the latest technological tools. Second, faculty (except a vocal few) expect the university to provide the latest information technologies for their research and teaching. Third, universities are looking for ways to reach out beyond their campuses through distance education, and the new technologies enable that outreach to occur. Fourth, current employment trends indicate the need for a more educated workforce, especially in high-technology fields such as computer science, computer information systems, and engineering.

All four reasons are primarily market driven. Students expect it; faculty will leave if they do not have access to it; distance education is not possible without it; and most professional fields need graduates proficient in it. A 1999 U. S. Department of Commerce report, *21st Century Skills for 21st Century Jobs*, reinforces this emphasis on technology education and training. The report suggests that in the 1950s about 20% of the workforce were considered professional, about 20% were skilled, with 60% classified as non-skilled. In 1997, professionals remained at 20%, but those in the skilled category move up to 60%, and the non-skilled moved down to 20% (*21st Century Skills*, 1999, p. 1). Colleges and universities are challenged to meet the needs of more skilled workers in the economy today. The need for lifelong learning is more a factor today than ever before.

A *University* Coup d'état

Universities are being asked to deliver education and training programs directly to the workplace because of three barriers to students: the difficulty of scheduling courses, time commitment, and cost (*21st Century Skills*, 1999, p. 20). Compressed video teleconferencing and Internet Protocol (IP) video-streaming technologies are being used by some institutions to meet these challenges. But too few colleges are overcoming these barriers, which has given rise to a relatively new phenomenon, the *corporate university*. According to a recent survey by the *Corporate University Exchange*, U. S. corporate universities in major corporations increased by 1200 in the last 10 years, from 400 to more than 1600 (*Executive Summary*, 1999). At this growth rate, it is anticipated that corporate universities will outnumber traditional universities within the next 10 years. There is a trend to create Chief Learning Officer senior management positions and to name corporate training directors as deans. At present most of the corporate university courses are taught in classroom settings in-house, with only 20% using distance education technology. But corporate technological outreach is expected to more than double within the next few years, with plans possibly to recruit students from outside the company. The study also documents that 50% of surveyed corporate universities seek alliances with traditional universities to offer accredited degrees in business and high-tech areas. Publicly, most colleges and universities enthusiastically embrace the notion of corporate alliances. But not all universities are sanguine about such alliances. The practicality of setting up courses at work sites, issues of enrollment and

faculty time, as well as other administrative issues all become obstacles. Technological solutions are helping the situation, but there are deeper issues, especially when degree programs are discussed.

Many traditional colleges and universities feel threatened by the corporate university phenomenon. Traditional universities should not blame corporate America, however. The corporate movement is occurring because U. S. higher education is not meeting the lifelong learning needs of workers in a changing economy. But there are more foundational issues at play. It is clear that most corporations view their "university" as a training program that seeks quality instruction for its employees. It is also clear that the corporate university is treated like any other division of the corporation. It needs to operate in concert with the vision, goals, and strategies of the corporation. University academics rail at such a notion. In their view, higher education is a social institution unto itself and, thereby, free of the confines of even the most enlightened corporation. After all, corporations are in business to make a profit for their investors, to treat their employees fairly, and to be a good corporate citizen. Moreover, traditional academics hold to a principal that higher education should not primarily exist for corporate America's vocational education.

Thus, we have a situation in which elements of corporate America claim that U. S. higher education is holding America back because of outmoded notions of education. In response, some colleges and universities claim that a corporate co-opting of the term *university* (a philosophical coup d'état) minimizes the emancipatory dimension of higher education--its dedication to the common good, not individual corporate good. And it confuses high quality vocational training with a university education in the professions that has its foundation in the liberal arts. There is a way out of this vexing problem, however, and it is to be found in the foundational purposes of higher education. But before addressing the question directly, it is important to delve a bit more deeply into the impact of technology on culture more generally.

Cultural Questions and Philosophy of Technology

Americans tend to view technology's impact on culture (and themselves) in two primary symbolic ways: one is empowerment, the other is disintegration (Staudenmaier, 1996, p. 5). The empowering aspect of technology is that it gives us the benefits of scientific revolutions and discoveries. Infrastructures such as power systems, health care, industrial production, scientific farming, transportation, telecommunications and many other technological necessities increasingly free us from the uncertainties of nature. One has to marvel at technologies employed in supporting a million people or more in a major city, or to use a computer to communicate with people almost instantaneously on the other side of the world. Technology, viewed in this way, enables and amplifies human potential.

Disintegration, as an opposing symbol, is the other side of the technological coin. Watching on television the aftermath of a plane crash, losing power or water supply, having a computer network crash, are just a few examples of how we are at the mercy of the technologies and systems that are supposed to serve us. Just as technology can be empowering, it can also be disabling when it begins to disintegrate. And disintegration can be internalized as a sense of helplessness amid huge systems over which one seemingly has no control. These social

implications do not account for an even larger issue. We are only now beginning to realize how natural ecologies can be adversely affected by technology. Are we in danger of disintegrating our place in the natural world as well?

Both empowerment and disintegration are equally valid symbols. The now tired phrase, "high tech, high touch," is an attempt to gain the benefits of technology without losing a sense of humanity in the process. Disintegration, however, is a much deeper issue. Which leads to another set of factors to consider about technology, is technology simply a set of tools to use, albeit sometimes sophisticated tools, or is technology much more than that? Does it affect our basic view of reality?

What is Technology?

Whether we conceive of technology as empowerment or disintegration, it is important to step back from the issue to examine exactly what do we mean by the term *technology*. The meaning of technology tends to be viewed in three primary ways (Gorokhov). First, technology is the aggregate of technique--human artifacts, tools and systems throughout the ages. Second, technology is the aggregate of all technical activities--including invention and discovery, research and development, manufacturing, design and planning, and so forth. Third, technology is the aggregate of all technological knowledge--from the most specific techniques to the most sophisticated theoretical systems. The point is that, depending upon one's perspective, technology can be viewed in very narrow terms or in the very broadest sense as well.

Just as the meaning of technology might be viewed differently, it is not surprising that philosophers and people in technological fields vary in their approaches to making sense out of it. Gorokhov proposes three categories of philosophical reflection on technology:

- Philosophical reflections of engineers (Reuleaux and the Technik and Kultur group of the Society of German Engineers, among others)
- Philosophy of technology (Kapp, Dessauer, Engelmeyer, among others)
- Philosophical criticism of our technological age (Heidegger, Ortega, Gasset, Ellul, Mumford, Berdyaev, among others)

One might add names and organizations to each list, but Grokhov's typology reflects the comprehensive way in which technology interacts with culture. The reality of technology's comprehensiveness should be a starting point for discussions about its relationship to the foundational purposes of higher education. The philosophical criticism category has the longest tradition and perhaps the most relevant to the question of its connection to philosophy of education.

Philosophical Criticism About Technology

Despite the pervasiveness of technology in culture some philosophers hold a *neutrality thesis* that claims that technology is neither good nor bad, significant or insignificant (Casey, 1996, p. 8).

Human intention and use of technology make all the difference. This position is somewhat akin to the notion that "guns don't kill people, people kill people." Casey claims that philosophy has taken technology seriously throughout the ages in Western culture (pp. 9-12). Both Plato and Aristotle were concerned with *techne*, the practical arts and crafts, as not being seen as ends unto themselves. They were concerned that this technical way of knowing should always be connected with *theoria* and *praxis*, theoretical and political ways of knowing. *Techne* that is unconcerned with the common good has the danger of becoming dangerous to society. Mere technique and "technology for technology's sake" disconnects human activity from the common good of human society and nature.

Philosophical criticism has a long history in Western Civilization, which tends to beg the question about its neutrality. The consensus is that technology does impact society and culture in profound ways. Casey provides three helpful questions to consider: technology's autonomy, its relation to nature, and its ultimate beneficence or harm (pp. 13-15). Technology's autonomy can be viewed in terms of determinism. Some people argue that we are no doubt influenced by technology, but we can selectively choose to use and participate in the technologies that we deem beneficial to a good quality of life. Others argue that we so rely upon technology that we cannot help but be affected by it, and even determined by it. Are we not concerned about our privacy being eroded by technology, or the time it takes out of our lives to have our machines and systems repaired, or the all-consuming drive toward increased productivity at the expense of leisure? Supposed laborsaving technologies, in some ways, have increased the amount of time we spend working. On the other hand, a case can be made for increased quality of life and life expectancies because of technology. Moreover, a case can be made that technology helps to promote quality of life for ever-greater segments of the population. Yet, others claim that it favors the dominant socio-economic segments of society. One may persuasively argue either side of the issue.

Technology's relationship to nature has provoked the most controversy in recent years. The global warming debate, toxic waste problems, and industrial pollution are just a few of the issues that galvanize positions on technology and the environment. The vociferousness of the debate is indicative of the magnitude of the implications of misjudgment. As environmental activists point out, "it is not possible for people to be healthy on a sick planet." Opponents counter that as we become more enlightened about environmental hazards, technologies are made "cleaner" and technologies are used for the cleanup.

Connected to both the issues of autonomy and ecology is the question of technology's ultimate beneficence or harm. Casey poses a classic philosophical question: Has technology evolved to the point that a *technosphere* is replacing the biosphere and have the natural and the artificial been integrated so much so that they are inseparable (p. 15)? How intelligent is artificial intelligence? Are we at the cusp of an era of technological evolution that is a natural extension of human evolution? The fact is that the answers to these questions will not be known until we live through this era. The environmentalists claim that is the problem: That more certain future may be part of an irreversibly damaged natural world.

These perplexing questions are important for our era and need to be addressed in an atmosphere of independence and responsibility for the common good. And this need points out

higher education's primary role as the set of social institutions that provides education, freedom of inquiry, and research. Moreover, these questions clarify a basic difference between higher education and the training programs (of corporate universities and otherwise). Put simply, training emphasizes *how* to do things, education emphasizes *why* we should do things. An adequate philosophy of education provides a substantive answer as to how to accomplish both the *how* and the *why*.

A Philosophy of Education for the Late 20th Century

Given the foregoing discussion about the nature of technology in the late 20th century and its effects on society and culture, what philosophy of education has the potential of addressing the needs of our time, technological and otherwise? What follows is an appropriation of John Dewey's philosophy as it might apply to the current situation.

A case can be made that in this era there are tendencies to reprise the educational philosophy in vogue in the last decade of the 19th century and early 20th century, namely, a subject matter orientation to education. The Progressive Movement spawned in the early part of this century was a reaction to the Traditionalism of the time. The Progressives, with John Dewey (1859-1952) as a philosophical hero, critiqued Traditionalism's view of learners as passive vessels into which knowledge is poured (or forced into) for the learner's own good. His writing on philosophy and education was prolific with over 5,000 pages in articles and 18,000 pages in book form (Boschee & Schmoll). Dewey challenged this subject matter dominated view of education by promoting the idea that learners need to discover how to reflect critically upon their experience as well as on the subject matter presented to them.

He recognized that some proponents of Progressivism deserted subject matter entirely in favor of a student-centered, process approach to education. Dewey disavowed this dualistic view. He clearly valued both subject matter *and* educational process. Dewey's passion for fighting against dualisms and "either/or" mentalities led him to write *Experience and Education* (Dewey, 1938/1963) in which he asserts that the interaction of subject matter and process is the art of education, and engaging the continuity of human experience is central to the art of living. Thus, very early in the 20th century, Dewey was pleading for holistic education in a world of increasing specialization.

Dewey lived through the transition of America from an agrarian society to an industrial society. He witnessed the increasing breakdown of small town life and the emergence of the American City. Dewey wanted schools to be the places that students could experience community amid big city life. His philosophy suggests that all of life has scientific, aesthetic and cultural dimensions, and many ways of communication. Good education resists disjointing these dimensions because, in truth, they are needed by people in all professions.

He claims that education involves the continuing reconstruction of experience, and that the process and goal of education is human growth (Dewey, 1897/1987). By reconstruction, Dewey means that human beings grow through problem-solving experiences through the use of reflective thought. He contends that we are constantly reconstructing our experience. Education helps us to

learn from our experience in more intentional ways and through the use of greater resources. Human growth, the aim of education, is the product of reflected-upon experience.

Then and Now

In an analogous way, the late 19th century's and early 20th century's educational struggles are our struggles. The U. S. agrarian culture was beginning to give way to an industrial society, just as our industrial society now is being transformed into an information or knowledge society. I contend that this latest transition has brought an emergence of a Neo-Traditionalism with a renewed emphasis on subject matter and institutional tradition. Moreover, we have Neo-Progressives with us as well who emphasize student needs for educational access and skill training as well as institutional restructuring.

The new technologies have aided both positions. Some examples--Neo-Traditionalists call for the use of the Internet in two primary ways. First, it provides the vehicle for delivering information ever more efficiently, and the more information one receives the better the education. Second, they insist that the information be either delivered by or coordinated by the instructor from a traditional college or university setting. Thus, the Internet simply provides a technology that enriches a traditional college education with more and diverse information. The core education remains the same.

Neo-Progressives view the Internet much differently. Its real power is its interactive capabilities and freedom of access. The World Wide Web, for Neo-Progressives, is just that, an interactive web of not only computers, but people as well. No longer is credible information locked in the vaults of university Ivory Towers. In this view, the traditional university instructor becomes a guide for students rather than a mentor. But more importantly, the guides need not be connected with the traditional higher education. Corporate university deans can find guides within their company and from different segments of the economy and culture. Moreover, through the Internet and other technologies, education and training can be delivered from anywhere, and just-in-time.

These characterizations (of Neo-Traditionalists and Neo-Progressives) are somewhat exaggerated and painted broadly to make a point. We live in a period of cultural transition with a velocity like no other. The new technologies generate the speed of the transition, and they present us with unprecedented opportunities and challenges. Their power makes the stakes higher than ever before. For these reasons, we need a philosophy of education that accommodates new ways of learning and new structures while preserving the best of our traditions as well.

Dewey's philosophy of education with its emphasis on the unlimited potential of human growth as both its aim and process and its dedication to community serves us well in this age of ever-increasing specialization and transition. Higher education and corporate training, for instance, need the dialectical balance of content and process, quality and access, relevance and substance, and credibility and innovation. The integration of these educational qualities will not occur unless we engage in a continuing conversation in the context of a U. S. community dedicated to the common good.

Policy Implications

Given the foregoing analysis, four policy implications for U. S. higher education might be drawn:

1. Philosophical Consideration about Technology and Culture. As a social institution dedicated to teaching, research, and service, higher education is well positioned to provide a forum for the exploration of the complex and troublesome issues surrounding technology. This forum places conflicting perspectives on a relatively equal plane.

2. Philosophical Consideration about the Nature of Education in the Information Age. Colleges and universities should articulate and evaluate their philosophy of education in light of the demands of the era, and most particularly, the demands of dealing with the new technologies. Avoidance of this difficult type of introspection places the mission of colleges and universities in danger of becoming obsolete.

3. Differences Between Education and Training. Lifelong learning is becoming a reality in U. S. society. The need for a more skilled workforce is a primary feature of the transition to a knowledge or information driven economy. Much of the learning needed is at the level of training, whether on the job or sponsored by the corporation. At the same time there is the need for baccalaureate level education that has a liberal arts foundation. Training is crucial for the efficient and competent operation of technology and organizational systems. Education gives a broad context for the evaluation of training, and most importantly, for the broadening of human horizons through interaction with the wisdom of the ages. When we better understand differences between education and training, we appreciate and value them ever more.

4. Education and Training Access. The key for U. S. economic and cultural success in the knowledge age is access to learning. An educated workforce and an enlightened citizenry have been part of the U. S. lore from its very beginning. We do not have the luxury of viewing this dual goal is an ideal. Rather, it needs to be a reality for all our people. And we do not have time to work this out in the political arena. Even relatively small countries like Ireland are making their mark in the knowledge age through their investment in the education and training of their citizens, with a tremendous pay off in increased economic growth and quality of life for its people.

A final note, new higher education structures are emerging to meet the educational needs of the United States. For profit universities and virtual universities are receiving accreditation and are attracting large numbers of students. Also, new training companies are emerging to meet the training needs of the workforce. These new institutions provide the immediate motivation for U. S. higher education to meet the challenges of our time. The best way to accomplish this institutional transformation is through a reevaluation of the very philosophy of education upon which colleges and universities operate. Dewey's challenge to avoid either/or mentalities and to aim for holistic human growth that accommodates profession and human development will serve U. S. society well in this age of transition.

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