

**Discourse and Discipline in the Digital Domain:  
The Political Economy of the Virtual University**

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## Abstract

This paper will examine the imagined and material forms being given to the "virtual university" by specialist discourses and academic disciplines within universities, the state, and big business across the United States. It compares and contrasts the thin, for-profit, and/or skill competency versions of virtual universities being designed by corporate consultants and some state planners with a thicker, not-for-profit, and/or degree centered vision of the virtual university being pieced together by academics within some traditional universities. While the former bloc tends to stress quantitative pay-offs from virtualization thanks to downsizing or hollowing out traditional tertiary institutions, the latter often focuses upon qualitative enrichments in virtualization to be realized from restructuring many of the existing discourses and disciplines now at work on campus. These points are given context from personal experiences in the digitalization efforts of my department, college, and university in Virginia during the 1990s.

## **0. An Opening**

With the passage of time, most universities change. Some will counter the tide of neo-liberal cost-cutting and find the friends and funds out in society to continue their time-tested and self-directed course toward greatness. Many others, however, must face the hard realities of less financial support, diminished public backing, and fewer special prerogatives. In this environment, the techno-fix of the virtual university is thought by many to provide a single solution for many problems. Universities must change, according to the penny-pinching partisans of the virtual university, to become more efficient, more like for-profit businesses with their thin managerial hierarchies, hollowed out service centers, and flexible work forces. Computer-mediated communications coupled with multimedia content and flexi-time employees working without benefits or tenure supposedly can make it all happen.

These scenarios of change are certainly in the wind. And, as their devotees claim, such strategies definitely can, and indeed will, happen. Yet, these business-oriented solutions get almost everything wrong: both about existing universities and in their vision of a virtual university. These technologies should not be used in Taylorized work structuring programs to cheapen labor, cut costs, and dilute product quality. The real promise of computer-mediated communication is using technologies very creatively to revitalize human interactions rather than misusing them so efficiently that they deaden everyone's personal

experiences with higher learning. The virtual university is not worth building unless and until these technologies are used to enhance everyone's learning. And, those who are now teaching and learning with such technologies on campuses around the world must rededicate themselves to shielding what is still worth saving in traditional universities from mindless economic rationalization by reinventing much of their universities as virtual research, learning, and service communities.

This study addresses these contradictory tendencies in the digital domain in order to explore the political economy of the virtual university. Disciplines and discourses all across the university can change for the better in the digital domain, but the digital economy and society behind them also can turn the virtualization of university services into new discourses of discipline to destroy those remaining freedoms that let academics do their work as they push everyone to bend to the new necessities of relentless global competition. Against the sudden emergence of so many thin, for-profit, and skill competency expectations of tertiary education, it may become difficult for the thicker, not-for-profit, and degree-centered practices of existing universities to survive in many markets after a few more years.

Given the tremendous profusion of cyberspaces in which computers are being fused with wired and wireless telecommunication networks into computer-mediated communication systems all around the world, we must consider much more

carefully the economic and political questions raised by creating institutions for higher learning on-line, or what many are imagining as "the virtual university." Many cybertouts and infoprophets among the digerati, from Alvin Toffler to Nicholas Negroponte, Howard Reingold to Stewart Brand, Steve Jobs to Bill Gates, have promised for nearly a generation some brave new world of equality, empowerment, and ease, if only everyone could "log on" or would "get wired." Like many any other bits of computer "vaporware," however, real performance thus far has not matched these enthusiastic promises.

No technology remains a univocal, monodimensional, or autonomous force within any society. Computer-mediated communication is no exception. Many different agents working for and against a vast array of structures are struggling to bend these technologies to suit their diverse interests and agendas. On one side, there are those who envision computer networks as tools to construct thin, for-profit, and skill competency based systems of training for life-long learners, beginning at age five and continuing on to life's end. On the other side, there are those who imagine computer networks can reorder existing universities, colleges, and schools around the qualitative enrichment of learned discourses and scholarly disciplines without losing the thicker, not-for-profit, and degree centered values of traditional academic life. Both alliances are up and running, and each of them is twisting and turning the technics and techniques of computer-mediated communication to advance

their respective contradictory projects.

This analysis, first, will discuss how culture wars and fiscal difficulties have led many to doubt the benefits and question of costs of traditional tertiary education, which has encouraged the doubters to look at virtual universities. Second, it investigates how the virtual university as an educational innovation might operate within the current global regime of flexible specialization vis-a-vis new systems of producing and consuming applied knowledge, or what Gibbons et al. call Mode 2 knowledge, as well as the older forms for acquiring and applying academic knowledge in traditional universities, or Mode 1 knowledge.<sup>1</sup> Third, this overview will conduct a critical close reading of virtual university-like institutions at the University of Phoenix and the Western Governors University. Finally, this consideration of the politics and economics behind virtual universities concludes by expressing serious reservations about how the conjunction of a worldwide technological revolution in cybernetics, the new economy of global flexible specialization, the rigid commercialism of Mode 2 knowledge systems, the hollow social consensus behind Mode 1 university practices, and neo-liberal moves toward defunding high education have combined in popular visions of the virtual university.<sup>2</sup> Yet, after articulating these reservations, another vision of the virtual university, tied to the Virginia Tech Cyberschool, is outlined as a possible alternative for mixing the flexibilities of Mode 2 knowledge production with the traditions of Mode 1 knowledge

cultivation.<sup>3</sup>

### **1. Culture Wars and Fiscal Crises**

The culture wars, and the associated attacks on what happens in the nation's schools, colleges and universities, cannot be dismissed as insignificant rhetorical exercises.<sup>4</sup> On one level, the publics served by educational institutions, rightly or wrongly, now question higher education's accountability and responsiveness to their needs. Smelling a "profscam" fermenting in almost every academic discipline, critics transform high profile cases of clear fraud, seeming abuse or dubious utility into proof-positive that colleges and universities must reconceptualize their basic understanding of teaching, research and service.<sup>5</sup> Real intellectual excellence, however, is rarely the target to which reforms must be redirected; instead, operating efficiency, conceptualized typically as industrial input-output measures, becomes the new gold standard of educational performance as the financial resources devoted to tertiary education continue to dry up.<sup>6</sup> For public institutions, there are many competitors seeking state funds, the taxpayers resist new rate increases, parents buck new tuition hikes, federal research monies are drying up, private R&D funds increasingly go abroad or to nonacademic labs, and philanthropic sources are tapped out. Private institutions face similar constraints plus growing consumer pressure to lower tuition costs or fund new borrowing sources to cover student bills.

Canonical teachings from the classic liberal arts education,

then, perhaps are sorely miscast in a world of flexible specialization.<sup>7</sup> Today, kanban ("just in time") management and kaizen ("continuous improvement") engineering are directing individuals away from the classic Aristotlean ideals of training every citizen for rich lives of ethics and politics through leisurely learning in order to hone their skills of subjection to the clock or to devote their talents to essentially mechanical training. The wisdom of United Parcel Service, or learning how "to move at the speed of business," and the teachings of Lexus, or accepting "the relentless pursuit of perfection," displace the teachings of Plato and Aristotle as the privileged codes used for imaging and fulfilling social individuality. The vast bureaucratic hierarchies of the corporate world, where one might have once usefully deployed insights from Socrates, Aquinas, and Kant or Sophocles, Chaucer or Lessing in contemplation of that organization's collective welfare, are eroding away in the global flows of post-Fordist exchange. For many, Aristotle's plea to impart the wisdom of statesmen at praxis to citizens of any polis falls on very deaf ears as job markets, parents, and taxpayers demand more and more of the techne needed by servile mechanics in subjection to the globalized marketplace.

The shortcomings of K-12 education cannot be ignored by universities, because failings there cause real problems for university educators. On the one hand, K-12 education in far too many venues has become an inadequate surrogate for primary socialization (personal morality, individual hygiene, group

skills) once acquired from the nuclear family, residential neighborhood or traditional church-going. And, on the other hand, teachers and parents tend to expect too little from students, believing that youngsters need time to watch TV, participate on athletic teams, and pursue leisure activities on weekends, while teenagers need time to work after school, date in high school, and acquire various high-status consumer goods (clothes, shoes, cars, beepers, etc.). Because so many high school graduates attend college, some K-12 education experts leave to universities the job of remedial make-up work on substantive knowledge or catch-up drills in vital skills.

As a result, many K-12 schools fail to impart the basic intellectual education that their parents, grandparents or great-grandparents gained by the fifth grade, eighth grade or twelfth grade. Students that do get to attend universities may get it there, but the cafeteria-style curricula of most colleges does not guarantee results even there. In turn, the majority of students that never go into post-secondary schools are left undereducated in school settings which are increasingly carceral institutions complete with armed security details, metal detectors at the doors, fenced/walled school grounds, and gang warfare in the halls. Universities today cannot teach the Western canon, because they are doing more and more clean-up behind failed K-12 teaching. Once new teachers hit the ranks of K-12 institutions, they too are now unequipped to bring that canonical tradition's secular/emancipatory benefits to schools

that are becoming "kiddie koncentration kamps" in far too many places.

At the university level, students are also caught betwixt-and-between one dying policy regime and another maturing one, because the neo-liberal social contract implicitly redefines post-secondary education as a private, not a public, good. College costs rose by 5 percent in 1996-1997 and 1997-1998, once again outpacing the inflation rate of 3 percent. Average tuition and fees tally up to \$1,501 for two-year public schools and \$3,111 for four-year students at public schools, while private four-year universities average \$13,664 during the current academic year.<sup>8</sup> Donald Stewart, head of the College Board, argues that public concerns over rising costs are misplaced, because only 9 percent of students attend schools where tuition exceeds \$16,000 and over 40 percent attend institutions where tuition is in the \$2,000 to \$4,000 neighborhood. Moreover, "for most Americans," Stewart asserts, "the fact remains that college is still accessible, especially in light of financial aid currently available."<sup>9</sup>

A silver lining of easy credit on the clouds of high college costs is little precious comfort to many, even after the first slight uptick in average household incomes since 1990 during 1995. After being adjusted for inflation, average household income was \$34,076, and the poverty level for a family of four was \$15,569 in 1995.<sup>10</sup> For those most in need of higher education's potential for upward economic mobility, it would take

one-eighth to one-quarter of their annual poverty level income to pay tuition and fees at institutions where the other 40 percent of Americans attend comparatively low-cost colleges. Meanwhile, average households would see basically a tenth of their annual income go for in-state tuition and fees, nearly a seventh for out-of-state schools, and over a third for a private university.

Lodging, food, transportation, books and other essentials are not even in the cost equation. And, these outlays are even more daunting for average Hispanic and black households. Their 1995 average household incomes only were respectively \$22,860 and \$22,393; and, in turn, 30.3 percent of all Hispanic, 29.3 percent of all black, and 11.2 percent of all non-Hispanic whites were working at the poverty level.<sup>11</sup>

Given these divergent family income and college costs trends, it is not surprising that student financial aid pools have filled to the \$50 billion level for the first time in history. Most of these funds, in turn, are packaged as long-term debt; nearly \$29 billion in student loans also represents a record level of indebtedness.<sup>12</sup> Many colleges and universities are nominally state-funded operations, but the traditional commitment to higher education as a vital public good deserving state monies has been lost amidst an emergent policy consensus that reimagines such cultural capital essentially as a private good. Rising tuition and fees, declining public funding, and increasing market awareness all are concrete proof, as James Appleberry, the president of the American Association of State

Colleges and Universities says, "of a policy shift that reflects a sentiment that higher education is solely at individual benefit and need not be funded to further the country's best interests."<sup>13</sup> The emergent regime of flexible specialization, as Reich observes, actually renders all of these rational calculations quite problematic as fast capitalist operations hollow out national economies, pull individuals from one country into another to be trained in another to work in yet another, and reduce the rational timelines for any serious investment decision from decades to days.<sup>14</sup> Given these realities, why should states invest in education when its human carriers are so mobile and its social beneficiaries often are located elsewhere?

## **2. Flexible Specialization Goes to College**

The era of flexible specialization dawned in the late 1960s and early 1970s with the emergence of "a new social system beyond classic capitalism,"<sup>15</sup> rising out of the digitalization of production, the globalization of exchange, and the deconcentration of organization by global business. From the ruins of Fordist regimes of industrial production and state administration, a loosely coupled constellation of transnational alliances of local markets, regional governments, global capital, and sophisticated technologies is testing its rules of flexible accumulation. New agencies from below and above the traditional power centers of national states and big business are collapsing most existing spatial barriers, time zones, and work rules.

As Harvey observes, the accumulation/production/regulation

regime of flexible specialization "typically exploits a wide range of seemingly contingent geographical circumstances and reconstitutes them as structured internal elements of its own encompassing logic....the result has been the production of fragmentation, insecurity and ephemeral uneven development within a highly unified global space economy of capital flows."<sup>16</sup> In turn, the teachings of the liberal tradition have little room for growth under the high-tech horizon of rationalizing performativity norms embedded at the core of this regime of flexible accumulation. When seeking the norms for this regulatory regimen as Lyotard asserts, "the State and/or company must abandon the idealist and humanist narratives of legitimation in order to justify the new goals: in the discourse of today's financial backers of research, the only credible goal is power. Scientists, technicians, and instruments are purchased not to find truth, but to augment power."<sup>17</sup>

The creation, circulation, and consumption of knowledge, then, as it has evolved during the Second Industrial Revolution, the rise of Fordist economies, or the growth of national welfare/warfare states since the 1880s, also is now changing rapidly. These changes, in part, are partial adaptations to knowledge needs in the welfare/warfare state, incomplete mobilizations of technique in the Second Industrial Revolution, or semi-effective efforts to provide surveillance/intelligence/maintenance for Fordist-era social contracts. Flexible specialization is a celebration of speed,

variety, and diversity on a postnational scale, whose informationalized productive forces require increasingly sophisticated inputs of data/information/knowledge from everywhere all of the time in order to function efficiently.<sup>18</sup>

At this juncture, a new performativity ethic for schooling now displaces the norms of Bildungsphilosophie once enshrined in pre-informational modes of education. This split, which is still neither total nor complete, needs to be examined more thoroughly.

#### A. Modes of Knowledge Production/Reproduction

While some pressure to reform the academy can be tied back to the culture wars, a greater source of change can be attributed to a new post-academic network of scientific research and technological development sites emerging all around the world. It is not a neat set of distinctions, but the authorial collective of Gibbons et al. in The New Production of Knowledge makes this point by differentiating between two knowledge regimes: Mode 1, or what we could call "culturally concentrated knowledge," and Mode 2, or that which they label as "socially distributed knowledge."<sup>19</sup> In an era of flexible specialization, the miscast qualities of traditional knowledge canons seem quite pronounced inasmuch as their concepts and categories frequently appear unable to hit or, even worse, to be aimed at profitable targets positioned in today's rapidly changing business environments.

Culturally concentrated knowledge is a complex composite of those intellectual products once largely produced and consumed in

traditional Cold War research universities, and the Progressive/New Deal/Great Society academic disciplines, which mostly have defined knowledge production. Developing alongside of national welfare states and vast bureaucratic corporations, culturally concentrated knowledge was produced on campus by academic researchers to be transmitted, first, to students in accredited degree programs or, second, to clients in government, industry or nonprofit organizations through sponsored research contracts. Knowledge in its classical, Renaissance, or Enlightenment forms--as natural and moral philosophies--was recarved after the 1880s into the professional-technical disciplines of natural, social, mathematical, and engineering science only to be reassembled in various associated institutions of parallel teaching and research missions, like colleges of liberal arts and humanities or physical and mathematical sciences, on any university's campus. Consequently, such knowledge most often has taken shape in abstract, but quite homogenous, pre/non/extra/non/pragmatic forms that are typically regarded as scholastic, theoretical or academic.

Because culturally concentrated knowledge serves the interests of its on-campus disciplinary communities of concentration, the markets for it also tend, first, to be embedded in mostly hierarchical symbolic exchange (careerist honors, departmental rankings, journal status, university prestige, etc.) and, only then, to be mapped into practical exchange (patents awarded, royalties paid, grants obtained,

profits realized, etc.). Awareness of these products mainly is gained from institutionalized academic channels (prestige journals, major conferences, top publishers, faculty networks), so where such findings are published is a key mark of its alleged importance.<sup>28</sup> Quality control allegedly is exercised through peer review, social accountability is not accorded a high priority, and professional reflexivity is invoked only intermittently in the process of various researchers forming or unraveling networks of research. The time-honored purpose of culturally concentrating knowledge in this fashion is data/information/knowledge accumulation. Each university community and scholarly discipline, then, represents an ark of authority and legitimacy, which mostly has survived as a repository of diachronically accumulated truths to be reworked in a disciplined fashion under the auspices of each new academic enlisted on to the ark's permanent crew.

This mode of knowledge on campus has been the register of embodied projects of nationalistic homogenization and enlightened vanguardism by the professional-technical classes off campus. Culturally concentrated knowledge is Bildung. It articulates national mythologies, technological hegemonies, and privileged class-consciousnesses which modern nation-states need to operate.

Eurocentrism often nests in the liberal tradition, as it has been represented by such Mode 1 knowledge systems; and, in turn, these alleged Eurocentric formations of privilege and power in various disciplines and discourses are what multiculturalists and

right-wingers attack in the university.

Socially distributed knowledge, on the other hand, is an emergent amalgam of intellectual products now mostly produced and consumed outside of traditional university settings, and quite often in the material context of very short-run corporate outsourcings, task-specific government contracts, or entrepreneurial venture capital start-ups. Such Mode 2 knowledge, ironically, still depends upon Mode 1 knowledge centers for most of its constituent elements--trained personnel, physical facilities, research programs, professional networks, or organizing paradigms. Nonetheless, more and more of these resources can be found off-campus or outside of academe. It is applied, heterogenous, nonhierarchical, transient, commodifiable, and specific knowledge, which may not be widely disseminated or openly published.<sup>20</sup> Mode 2 knowledge embodies a new means of combining these elements to attain very different concrete goals, namely, those of consulting groups, think tanks, government bureaux, industrial labs, pressure groups, research centers, or advocacy coalitions. Because these producers do not need to be concentrated on campuses to train students, their sites of operation can be linked informally by fax, express mail, phone, or the Internet in highly virtualized, ad hoc work teams. Rather than sustaining disciplinary traditions, socially distributed knowledge is far more flexible, time-urgent, multimodal in its shape and substance. Its practitioners often need to be aware of scholastic, theoretical or academic discourses, but most of their

activity is very concrete and applied.

Given that socially distributed knowledge is produced and consumed in applied settings, it needs to be transdisciplinary, empirically anchored, heterogeneously sourced, and organizationally mixed. Specific problems of environmental protection, crime prevention, infrastructure reengineering, or health monitoring, for example, require such transdisciplinary teams with various heterogeneous methods all addressing a shared problem together until it is mitigated or contained. The next problem will be different, so it will require that entirely new teams be assembled as part of its resolution. Particular clients demand substantive products to meet pressing needs, which create a more effective market demand and supply for such knowledge producers. Awareness of its outcomes is derived through the problem's resolution or in-house memos, mass media programming, corporate sales, research reports, and on-line postings that summarize how the once pressing problem tying together this or that network was addressed. Quality control is exerted through marketing success or failure, technical effectiveness or ineffectiveness, policy satisfaction or dissatisfaction, whose real constraints serve as the markers of social accountability and professional reflexivity built into the process of socially distributing knowledge. Indeed, the demand for it becomes an integral part of defining problems, organizing problem solutions, and evaluating problem mitigation performances in financial, political or technical terms. Even though particular

constellations of socially distributed knowledge production are transitory, the general tendencies that these arrangements represent are fairly fixed in the everyday workings of post-Fordist flexible specialization. Mode 2 is knowledge as performativity. The contemporary relevance of socially distributing knowledge along these lines, in turn, appears to be data/information/knowledge acceleration. And, to be seen as a responsive educational centers, most universities now need to serve as repackaging/relaunching/redeveloping ramp for synchronically accelerated truths to be releveraged in applied contexts with hopes of extracting new practical valorization of its theories and practices by those transdisciplinary teams that can truck, barter, exchange or trade from its multiform utilities.

This mode of knowledge can be a source of interdisciplinary collaborations and multidisciplinary ferment, whether it is found in political projects of "relevance" or applied pay-offs in "problem-solving," "practical knowledge," or "real work tips." Such knowledge formations represent the efforts of insurgent restructuring campaigns on campus from "below" or "within" to reshape ossified disciplinary divisions and dissatisfied consumers off-campus working from "above" or "without" to get universities to address serious economic and social problems by accelerating the use of knowledge in many transdisciplinary applications. Even so, the long-term implications of Mode 2 knowledge are being faced only now by many colleges and

universities, whose key traditional source of legitimation--their effectiveness at culturally concentrating homogenous academic knowledge in hierarchical disciplinary canons at fixed intermural sites to teach the next generation its most valued wisdom from past generations filtered through the insights of the present generation--is being rapidly eroded by the apparent utility and flexibility of socially distributed knowledge.

High tech jobs are the epicenter of these changes. Somewhat surprisingly, for example, the number of graduates at American universities in computer and information science over the past ten years has declined rather than risen despite the vast explosion of work in this field. 41,889 students graduated in computer science in 1986, while only 24,000 took such degrees in 1994--mostly due to the fact that "students interested in computer work are increasingly opting for on-the-job training" (out in Mode 2 knowledge application settings) instead of being a college "major in the field" (at Mode 1 knowledge accumulation centers) on university campuses.<sup>21</sup> This is the "Bill Gates" effect, reflecting many students' sense that you can drop out of Harvard without a degree and be worth \$38 billion before turning 40. Socially distributed knowledge, then, is pulling learners into applied knowledge centers to acquire skills, while enrollments among old wave culturally concentrated knowledge institutions go flat or decline. In response, universities must become, or pretend to be, as agile points of information creation.

Because knowledge is power, and it can be bought and sold, its performativity today in fast capitalist society is becoming essential. However, not much performative product can be bought off of the shelves at Mode 1 venues from universities; as a result, Mode 2 sites generate more and more performative power, capturing the commodifiable attributes of applied knowledge at the point of sale itself away from universities. And, each sale necessitates another "just-in-time" assemblage of continuously improved product in order to stay competitive: practices that most tradition-bound, over-institutionalized, change-resistant universities will never fully adopt on campus. So philosophia or epistemologos, which putatively anchor Mode 1 knowledge centers, are being eclipsed rapidly by the kanban and kaizen ethics of Mode 2 knowledge networks.

Some colleges and universities, like those private institutions on the top twenty lists of government and industry funding or public institutions with federally-mandated land-grant obligations, are already partially reconfigured as Mode 2 knowledge producers. For the most part, however, the Mode 2 component is parked off campus at arm's length in corporate research parks or centered on campus in mysteriously organized government research centers, which allows the Mode 1 structures of the university to operate relatively undisturbed, albeit subsidized by overhead dollars from these Mode 2 dealings. Yet, many other universities have no, or only a low, Mode 2 profile, and the performativity ethic of post-Fordism by default

increasingly assumes that they are anachronistic places where knowledge is loafing or nobody will pay for their useless outputs.

The advent of the World Wide Web reflects how thorough-going this impetus toward socially distributed knowledge has become. The strategic alliances and informal ties of Mode 2 research networks organized on-line now provide a real alternative for performing instruction and service as well as research to university planners. The virtualization of knowledge production in Mode 2, once again, invokes "the correspondence principle" between schooling and work, leading many to ask either if a "virtual school" is not the best place for students to learn their essential skills for virtual worklives or if virtual outreach should displace professional duties on the service side of any university faculty member's job plan. Culturally concentrated knowledge production known as "teaching" at "contact institutions" in real-time and face-to-face colocation might very well be imploded by socially distributed knowledge networks-- cyber-schools, info-institutes, virtual techs--as learners interact on-line screen-to-screen in asynchronous modes at dislocated nodes of the Internet. The costly overhead in bricks-and-mortar Mode 1 centers as well as the troublesome personnel frictions of any permanent large organization with people in continuous face-to-face contact all could be eliminated, or, at least, substantially reduced by migrating out into the World Wide Web as more high-tech/high-touch, informationalized points of

pedagogical presence, just like Mode 2 research webs.

#### B. Market-Oriented Restructuring

As problematic as it might sound, Mode 2 knowledge practices already are touted as models for all colleges and universities still stuck in the pre-performative practices of Mode 1 systems.

Playing off of the truism that not all education happens in the classroom, the promise of socially distributed knowledge is that new educational approaches in networks will emphasize the development of "the whole person." This gambit basically can become a pretext for reengineering universities, understood as Second Industrial Revolution factories, in the form of the "shell buildings" favored by flexible specialization.<sup>22</sup> University reform, then, advances toward dismantling the material apparatus of culturally concentrated knowledge: instead of doing everything across a comprehensive curriculum at all campuses, many things will be trimmed to bolster "areas of excellence." Likewise, the model of mass production of standard product for fixed vast markets in Fordist "economies of scale" will be shifted toward post-Fordist "economies of scope," bringing specialized products to targeted small markets.<sup>23</sup> Existing disciplinary divisions will be broken down or recombined into new interdisciplinary majors or transdisciplinary skills, which will, in turn, pivot upon co-curricular and extra-curricular activities in outside work settings or community outreach activities. Rather than paying lots of instructors and advisors to guide students, students will be expected to assume much more

responsibility for their own learning--all life long as a whole person.

In this way, initiatives for "educating the whole person" will pay off handsomely at the bottomline by enabling university administrators to turn accursed revenue shortfalls into pedagogical blessings. Reducing the mix of disciplines saves money. Cutting back on faculty, as peer learning or self-study serve as substitute instructional forms, saves money. Buying fewer serials and books for the library saves money. Building smaller, less numerous facilities by migrating out into virtualized infostructures to teach, advise or service students saves money. Replacing "on campus seat time" in lectures with transdisciplinary service learning or extracurricular credits for worktime saves money. Constructing digital libraries, and virtualized instructional spaces instead of physical libraries or material dormitories keeps students home and, most importantly, saves money.

Success, then, in socially distributed knowledge networks will suit the norms of post-Fordist flexible specialization instead of goals from Fordist era models of mass production. To achieve excellence, performativity norms indicate that it will be necessary to do much less, not much more. Instead of expanding degree programs, hiring more faculty, enrolling additional students, buying more books, erecting new buildings, or elaborating disciplinary frameworks, the university of the 21st century often will be seen as effective only if it can

discontinue degree programs, fire more faculty, enroll fewer students, buy fewer books, shutter existing facilities, and consolidate disciplines into more compact units. Such moves, following those in pre-informationalized manufacturing and services out in the business world, will attain success only if the university begins outsourcing its services, downsizing its offerings, flattening its hierarchies, and trimming its personnel.

This trend toward restructuring can be observed in university administrative structures now. Often what were single large Colleges of Arts and Sciences in the 1950s, for example, are being broken down in the 1980s and 1990s into many much small colleges of humanities and letters, social sciences, languages and literature, on the one hand, and on the other hand, built up into colleges of mathematical and computational sciences, biological and environmental sciences, physical and applied sciences. These new divisions typically reflect the split among the have-nots and the haves, service departments and research units, low levels of soft money contracting and plenty of soft money sources. The disciplines in the second series of colleges want to stop subsidizing those in the first series with the once commonly shared overhead pool and budget lines of the old unified arts and sciences college. In turn, each new division head or dean in these practical colleges with Mode 2 knowledge potential will keep whatever margins that their research entrepreneurialism nets for them in-house, guaranteeing only that further gross

inequalities will ensue.

Under this new academic economy, real material inequalities are developing. Colleges of biological, natural, physical or mathematical science, while still perhaps complaining about the budget squeeze, have top drawer office space, high salaries, plenty of staff, the latest computing equipment in complex networks, new faculty hiring, and lots of students. Colleges of social science often have second-rate office space, passable pay, staff shortfalls, some stand alone PCs with a little networking, occasional hires, and lesser student demand. Colleges of humanities or letters and languages, save perhaps for growth in the multiculturalism sectors, usually have third-rate office space, stagnant salaries, totally inadequate staff, few if any computers, rare hiring opportunities, and little student demand save perhaps for the junk major or undecided student markets.

Consequently, restructuring around Mode 2 knowledge games tends to build much higher walls on campus among colleges as it tears down barriers in all disciplines to outreach, service learning, and research contract commercialism off campus. Unless a university has always had top drawer humanities and social sciences departments, these disciplines will increasingly become service departments to general education needs for students in more marketable disciplines. Likewise, the promise of merchandisable science, research parks, or corporate contracts all provide ample rationale for making most new investments in colleges of business, engineering or applied science as "centers

of excellence." In deciding between the liberal tradition of culturally concentrated knowledge with its grounding in Bildungsphilosophie or the modern economy of social distributed knowledge with its networks of performativity, the economy continually trumps tradition.

Nonetheless, even these social formations also are now wracked by crises and conflicts in an era of flexible specialization. The imagined community of strongly centered nation-states, whose statist managers relied upon their liberal education's classical canon for their political realist codes and nationalistic civil religions, are fragmenting in the flows of fast capitalism and global communication. Likewise, big banks and corporations are breaking apart into more global, fluid, flat networks, destroying the national, fixed, pyramidal hierarchies where liberally educated managerialists once conducted their affairs. Parents and students now rightly ask "A liberal education--What good is it?" On one level, they are right. The jobs for which liberal arts training once prepared students are disappearing in national government and corporate downsizings. Law school and graduate school products also have very difficult times ahead for them in the labor markets as the debureaucratization and deprofessionalization of society close off enhanced employment opportunities for them. And, on a second level, they articulate widely shared doubts about the resonance of such training intellectually for a world governed by economistic decision models, mass mediated sound bites, or

corporate accounting codes. What Aristotle, Spinoza, Kant or Sartre have to say about living lives of virtue or authenticity never appears on the radar in most government and business offices. Even more disturbing, very few intellectuals with any liberal education work in most university departments today. Faculty lounge talk is like that in factory lunch rooms-- retirement planning, football pools, planning golf games. Many academics could as well be selling refrigerators or pushing paper for the Social Security Administration; few ever wonder what Balzac, Montaigne or Boethius might say about their daily lives. So, everyone wonders, "Why bother?" A "liberal education" simply seems obsolete in the world of flexible specialization.

### **3. Virtual Universities and Flexible Specialization**

Up until now, the impact of flexible specialization on the university has been mostly felt in the form of reorganization campaigns guided from above. Such initiatives usually have been hatched first in colleges of business to guide the downsizing of real-world factories and firms. Whether they are labelled total quality management, continuous process improvement, management by objectives, or job enrichment, such rectification movements have tried to reengineer the workings of quasi-feudal university institutions to fit the seamless systems of kanban corporate outsourcing or the relentless regimes of kaizen technical development.

The results on campus, of course, range from the merely abortive to the truly disastrous, because universities still are

"schools," or contexts of leisurely learning, rather than "laboratories," or settings of laborious travail. Trying to impose notions from the downsized, post-Fordist workplace only burdens already overtaxed faculty and administrators with more requirements to turn out new data, plans or reports on the daily affairs of their worksites. It is an egregious category mistake to cast universities as factories; unlike most manufacturing operations, colleges deal with specific qualities of people, not general properties of materiale, discontinuous processes of intellectual growth, not continuous runs of uniform output, subjective communal decisions, not objective technical-choices, or enriched free time avocations, not impoverished work time vocations. Flexible specialization of campus is typically a monstrous affair, culminating in mindless outcomes assessment of students as if they were runs of widgets, absurd five-year cycles of post-tenure reviews in which one fifth of the faculty is surveyed every year by the other four-fifths to certify that they are still "productive stock" like peach trees or strawberry plants, or curriculum reengineering schemes whose product is more paperwork to certify the processing of students in key "core education" classes, which now usually constitute forty or fifty percent of all available classes.

#### A. One Model for Virtual Universities

Mode 2 knowledge systems, however, are now moving flexible specialization on college campuses from the realm of the farcical to the domain of the tragic. Beyond these programs of collegiate

re-rationalization, new informational economies and technologies off-campus are advancing the agendas of flexible specialization into the workings of universities as Mode 1 knowledge formations.

One widely feted model for university administrations and state bureaucrats charged with planning new initiatives for higher education in the 21st century, whether they are restructuring some existing university or designing an entirely new organization, is the University of Phoenix. Here, one sees a Mode 2 knowledge system for teaching.

Launched in 1975 by John Sperling, a one-time professor of humanities at San Diego State University, his for-profit operations evolved out of a series of adult education courses for police and teachers that the federal government funded to launch an anti-juvenile delinquency campaign.<sup>24</sup> Now it has 32,000 students at 45 sites in eleven states and Puerto Rico as well as on-line course sites accessible anywhere in the world that enroll over 1,500 students. Responding to the life-long learning market of nontraditional students and aiming to control costs, the University of Phoenix has forsaken all Mode 1 knowledge system obligations; it has a narrow practical curriculum, a nondisciplinary structure, no library resources, no research commitments, a flat, small central administration, and only part-time semi-professional faculty. Moreover, it runs on a for-profit basis; market performance, not peer review, valorizes its products.<sup>25</sup>

The reserve armies of the down-sized, under-employed, and

the non-degreed amongst the post-Fordist proletariat are the University of Phoenix's student body, while the overworked ranks of the still employed, but underpaid or unchallenged, salariat provide the institution's faculty. With graduate degrees in their areas of teaching, and with real-world jobs tied to these areas of academic expertise, the faculty are trained to teach from a standardized set of lesson plans out of a proprietary software package owned by the university. Some call it "McEducation," but many others, including the AT&T School of Business that uses the accredited degree programs of the University of Phoenix to let any AT&T employee earn bachelor's and master's degrees in house, believe that this is what education should be. In fact, June Maul, the AT&T School of Business' development director, sums it up quite succinctly: "our students don't want to hear about hypothetical stuff out of a book. They want what's relevant to their real-world jobs."<sup>26</sup> Consequently, it is no surprise that 80 percent of students enrolled with the University of Phoenix study business or management, and most of the remaining fifth are in nursing, education or counseling degree programs.<sup>27</sup>

Such virtualization schemes for education services requires the "campus-ization" of the learners' and teachers' domestic spaces or workplaces. The University of Phoenix, for example, expects that its instructors and enrollees "be computer literate and have access to their own computer and modem equipment."<sup>28</sup> Thus, instructional spaces that usually host teaching and

learning inside of material buildings are dispensed with almost entirely as both students and teachers acquire, maintain and upgrade their own ports to the virtualized university's points of presence on the Internet. The university provides a shell for accessing students, training teachers, credentialing learners, and sharing knowledge through loosely coupled transitory networks on-line. The University of Phoenix's Online Campus in 1997 not only "services students," but also provides "detailed information for professionals who are interested in applying to teach for the University of Phoenix OnLine Program," especially from "business, legal, and computer professionals with graduate degrees."<sup>29</sup> Moreover, the University of Phoenix portrays this cybernetic mediation as a virtue, not a vice. It "offers working adults the unparalleled convenience and flexibility of attending classes from your computer keyboard," because with the University of Phoenix's "easy to use software, you'll be able to join your classmates and faculty member 24 hours a day, seven days a week, from virtually anywhere you happen to be--hotel room, airport, office, or the comfort of your own home."<sup>30</sup> With performative promises like these, the University of Phoenix has grown into a fully accredited university with the sixth largest student body of all private universities in the United States.

On a larger scale, a consortium of seventeen Western states under the auspices of the Western Governors Association (WGA) resolved in February 1996 to collaborate together in the creation of a "virtual university," for all intents and purposes, to

leverage networks of socially distributed knowledge against culturally concentrated knowledge for the citizens of America's trans-Mississippian West.<sup>31</sup> This new entity, or the Western Governors University (WGU), aims to push beyond the liberal education of traditional degree programs to "enhance the marketplace for demonstrated competence through certification that is widely accepted by employers and traditional institutions of higher learning" by prototyping "expected competencies" from any WGU course of study.<sup>32</sup> Most importantly, the WGU will operate as a nexus for "multiple-source instructional inputs," whose acceptance will require "an explicit statement of the competencies that should be achieved upon completion, as well as an indication of the assessment methods that will be employed to certify these competencies."<sup>33</sup> Because the WGU must function in "the telecommunications age," the WGA directs that "flexibility and adaptability" be regarded as survival skills. "This premise," the WGA believes, "is no less applicable to legal form, governance, organization and structure than it is to technology and content."<sup>34</sup>

Incorporated on January 15, 1997, the WGU's corporate administrative headquarters have been sited in Salt Lake City, Utah, while its academic development offices operate out of Denver, Colorado as a inter-state "government consortium." Like most virtual corporations, these WGU headquarters are small, low overhead offices that only set quality control standards, fix policy expectations, and develop governance rules. Real academic

services, however, will be outsourced from independent vendors or provided locally at many distributed sites as WGU "franchises." By undercutting the average annual student costs of \$9,000 at a typical state university, the WGU aims to serve nontraditional older students, traditional college students needing extra courses, employees seeking various sorts of retraining, and life-long learners in the personal enrichment market. Competency-assessment not degrees are to be the main measure of student success, but the WGU also plans to offer a multi-track Associate of Arts degree.<sup>35</sup>

The WGU, then, will have no culturally concentrated traditional forms; its internal structure essentially is that of a functional shell as "a matter of operational convenience and efficiency" to implement its "degree-granting, licensed and accredited" missions without "the creation of a substantial overhead component."<sup>36</sup> Therefore, by combining "technologically-delivered educational programming" with a certainty of "certification through competency assessment," the design criteria of the WGU are that the organizational manifestation of its socially distributed knowledge formations will be: market-oriented, independent, client-centered, degree-granting, accredited, competency-based, non-teaching, high-quality, cost-effective, quickly-initiated, and regional in form and substance.<sup>37</sup> Rather than trying to do everything, like a comprehensive institution of a culturally concentrated type, the WGU aims to be a flexible, reflexive, hollowed-out telematic

junction for packaging/promoting/providing "outsourced content" in a regionalized network of knowledge networks already operating on the local, state, national, or international level. Thus, its greatest value-adding potential is to be centered on four discrete tasks in today's fast capitalist economy:

1. Creating broader markets for existing educational and assessment services rather than by creating an independent capacity to provide those services.
2. Fostering the development of new products and/or providers where unmet needs are identified and where sharing the costs of materials development and promotion is possible.
3. Utilizing incentive (market) rather than regulatory mechanisms to ensure the effective functioning of the WGU.
4. Working to remove barriers to interstate flows of educational activities and competency-based assessments.<sup>38</sup>

The bottomline here is "the bottomline," or the faith that "the WGU can provide significant benefits to all of its constituent groups at lower cost than current approaches."<sup>39</sup>

The whole point of WGU since its launch in 1995 has been "to break down the barriers of regulations, bureaucracies, tradition, and turf."<sup>40</sup> And this approach has attracted considerable corporate interests, including a large grant in February 1997 from the At&T Foundation. As Rick Bailey, AT&T's law and government public affairs vice president asserted, "AT&T is committed to supporting projects that benefit education and serve the needs of the public...The Western Governors University is clearly such a project. It's a bold, 'break the mold' approach to higher education in the western states."<sup>41</sup> The WGU plans in 1997 to meld private and public universities as well as corporate

enterprises into a pilot delivery system of its education providers by 1998. While the WGU features a few schools with some minimally credible academic reputation, like the University of Hawaii, Utah State University, and Northern Arizona University, many of its members are much less distinguished, like Eastern New Mexico University, Colorado Electronic Community College, and Chadron State College (Nebraska), as sites of scholarly research or university-level teaching. Despite this obvious lack of solid, high-quality foundations, the WGU's operations as a virtual university, even though it has yet to serve a single student, already have acquired mythic dimension. Indeed, the WGU now exploits this bizarre fame in a new canned Power Point demonstration, which begins with this screen: "Western Governors University...at times, reputation precedes reality."<sup>42</sup>

These operations do exist, and they are a growing threat to many, if not all, existing Mode 1 institutions whose reputed academic quality or marvelous scenery and weather might guarantee continued enrollment of real students in "contact institution." Mode 2 models of teaching are taking hold, even among solid, business-like institutions in the second or third-tier of the nation's major research universities. At my university, our institution's president, who is a former dean of the engineering school, recently updated the university's five year strategic plan. In the preface, he implicitly wrote about this cultural clash between Mode 1 and Mode 2 knowledge:

As we plan for the future, we must be mindful that the very structures of knowledge are changing; in areas such as materials, biotechnology, the environment, and information technologies, and across the humanities and social sciences, knowledge has broken boundaries that were once assumed fixed. We have learned that the problems of the real world do not often fall within disciplinary boundaries, nor are they always confined within a single department. We must be prepared to collaborate, to explore, to create new partnerships, and to teach and learn in wholly new and uncharted ways if we are to prepare our students--graduate as well as undergraduate--for a world we and they can only imagine. Changes in knowledge also require changes in organization, and within both academics and administration we must be open to transformations in the ways we organize ourselves to make new work possible, productive, and efficient.<sup>43</sup>

In other words, universities all now face a situation where permanent reorganization, transdisciplinary upheaval, and imposed partnerships must meet "the problems of the real world" in the 21st century. Little of this transformation is truly new or uncharted; it simply underscores an abrupt displacement of culturally concentrated learning as we realize how socially distributed networks of organizing ourselves might make this new work regimen possible, productive, and efficient. Being open to such transformations also increasingly means teaching students how to code their c.v.s as websites, sell their SAS skills to public opinion survey operations, or patent their senior theses as biotechnology products. Like AT&T's business school development director looking at the University of Phoenix's thin, for-profit, competency-based operations, traditional Mode 1 knowledge is seen as "hypothetical stuff out of a book," or nearly worthless disinformation.<sup>44</sup> Beyond the broken boundaries

of Mode 1 disciplines, it is quite obvious what lies ahead: whatever students, who already work or are preparing for specific jobs, see as "relevant" to their real-world jobs is the only worthwhile knowledge.

#### B. Another Path to the Virtual University

Like a few other states, Virginia--mostly aided by VPI&SU's Center for Network Services--is building a state-wide, broad bandwidth ATM network which will enable any remote site--junior college, public library, private home--with the requisite cabling to pull down World Wide Web content at T1 speed. Up and running on its first test legs during January 1997, this "NET.WORK.VIRGINIA" infostructure will permit any "content provider," whether it is a Mode 1 university or Mode 2 knowledge company, to service any "content user." To keep its students, VPI&SU must become, at least in part, like the University of Phoenix or the WGU simply to maintain market share as a "content" producer/packager/provider. As a result, our College of Arts and Sciences has developed the Virginia Tech Cyberschool with over 300 web-ready courses to post on the web at VTO, or Virginia Tech Online, the university's virtual campus.<sup>45</sup>

Cyberschool was launched during 1994 in combination with a university-wide faculty retraining program, or the Faculty Development Initiative, which has given every faculty member a new, high-end, Apple multimedia computer and a week-long training session in several Internet, desktop publishing, and multimedia software packages. The original inspiration behind Cyberschool

was to focus upon teaching undergraduates away from campus during the summer over the Internet to insure degree completion in four years or less. To meet this goal, however, the Cyberschool faculty and others recognized how extensively the university's standard operating procedures needed to change in order to be flexible and responsive enough to provide these services. Consequently, Cyberschool has evolved into a more radical institutional reform movement in addition to remaining a group of faculty who want to develop more on-line courses. This outcome, in turn, is forcing the Cyberschool faculty to develop an alternative path to the virtual university.

Instead of starting with a clean sheet of paper to build a corporate-oriented thin, for-profit, skill competency based virtual university, like the University of Phoenix or Western Governors University, the Virginia Tech Cyberschool is renovating the public-supported, thick, not-for-profit, and degree granting structures of the traditional university, injecting bits of performativity while remaining committed to Bildung. After offering their first classes in 1995, Cyberschool faculty have pushed the university to adopt many new reforms, ranging from mandatory individual computer use for students, new technology support fees, student peer learning and teaching, and mandatory electronic thesis and dissertation submissions to on-line student registration, electronic records access, digital university press publications at a digital discourse center, alumni-centered life-long learning initiatives, and redefined faculty reward systems.

At the end of the day, these reforms are all directed toward making the university's research, teaching, and extension services more responsive to changing demands off campus and new needs on campus.

Mode 2 knowledge systems, then, are reshaping Mode 1 academic practices in response to flexible specialization in Virginia, and content from the liberal tradition is no longer necessarily at the top of the menu here. Moreover, these pressures also are being felt below the college-level. Franklin County, Virginia, which is renowned for its local moonshine industry and racing car tracks, is merging Mode 2 knowledge networks with its K-12 education. Its Center for Applied Technology and Career Exploration (CATCE) will bring broad bandwidth network connections to the class site.<sup>46</sup> Not actually a classroom building, CATCE's class sites will be "simulated work stations" in virtual factories, virtual offices, and virtual service centers. Junior high school students actually will simulate "going to work" at these sites which are organized to "educate employees for the next millennium." The Mode 2 knowledge forms needed to engineer RAM chips for PC assembly, respond to oil spills in the Chesapeake Bay, or data process patient records for hospitals in Chicago will all be at these virtual job sites where junior high kids can practice pulling down "net" work to their work stations in Franklin County, Virginia. So socially distributed work is bubbling up within a market once presumed to be the service area of Virginia's old-

wave, Mode 1-style universities. The liberal tradition is not well-suited to reducing frictions in the machineries of performativity; nonetheless, this is precisely the reason why it is needed more than ever in an era of flexible specialization, if only to confront the emptiness and alienation that such schemes of virtualization for education promise to bring from global work to still quite local schools.

Likewise, the fast capitalist agendas of global exchange, which pit locality against locality, people against people, markets against market in search of maximum performativity, need to face the critique of power, work, and scale embedded in much of the liberal tradition's teachings. Therefore, a world whose economy and society is increasingly tied to Mode 2 forms of knowledge needs Mode 1 forms of learning far more than most university administrators acknowledge in their frenzy to find practical applications for their current output of graduates, grants, and grades. While he is himself a capable critic of education's propensities for frivolous pursuits, Adam Smith's warnings in Book V, Volume 2 of The Wealth of Nations cannot be ignored in an era of flexible specialization.<sup>47</sup> As he argues, the perfection of new rational constellations within the division of labor leads simultaneously to enhanced efficiency in the workplace and increased levels of stupefaction among the workers.

Those "whose whole life is spent in performing a few simple operations, of which the effects too are, perhaps, always the

same, or very nearly the same, has no occasion to exert his understanding, or to exercise his invention in finding out expedients for removing difficulties which never occur....the torpor of his mind renders him, not only incapable of relishing or bearing a part in any rational conversation, but of conceiving any generous, noble, or tender sentiment, and consequently of forming any just judgment concerning many even ordinary duties of private life."<sup>48</sup> An education rooted in the liberal tradition, it seems, must be counterpoised against this tendency lest, as Smith fears, the hidden hand of the marketplace leave "all the nobler parts of the human character...obliterated and extinguished in the great body of the people."<sup>49</sup> For any national community, this cultivation of liberal learning by whatever means available is essential, because no people will be able to attain the good life when it becomes caught in the torpor induced by the mass media, post-Fordist labor, or failed Mode 2 forms of schooling.

Virtual universities, then, must embody radical changes far greater and much more diverse than simply using computer multimedia to enhance the teaching of workplace skills. The experiences of the Virginia Tech Cyberschool, for example, are far more involved than simply using more computers or designing efficient Mode 2 operations. Many visions of the virtual university do little to move past a very limited set of changes, while a few, including the Virginia Tech Cyberschool, are beginning to see how fundamental some of these technology-driven

changes actually could become. First, a virtual university in many ways could be an entirely new form of learning community. Anyone who operates extensively through computer-mediated communications notices this fact every working day. E-mail interactions are displacing telephone conversations, F2F meetings, and personal exchanges in ways that are carried in written texts. While this traffic is also fleeting, underdeveloped, and exhausting, it is textual, hypertextual, or multimedia. Written words carry more and more institutional traffic on campus, and basic information resources once printed in catalogues, mailed out as brochures, accumulated in libraries, or posted on bulletin boards now are pulled down from websites. Physical location, synchronously shared times, and group meetings are becoming less vital to learning than network connectivity. So access to education is quickened and broadened. In addition to everyone who would be traditionally on campus, one finds nontraditional students, clients abroad, not-for-credit students, and residential students temporarily located elsewhere all commingling together at our virtual university site in new kinds of communal interactions.

Second, new discursive possibilities are developing within, and as integral parts of, our virtual university as on-line technologies begin to do much more than simply electrify print documents. The WWW, CD-ROMs, hard drive software, and floppy disks all represent new communicative media whose variations are sustaining fresh modes of discourse with their own conventions,

formations, and practices as well as unconventionalities, misformations, and malpractices. In-house administrative discussions and external research communications on the WWW in PDF, Eudora, or Word software packages are generating hypertextual, multimedia, or technoscientific discourses, which carry a profusion of new logics, pragmatics, and rhetorics in their arguments. Research is being completely conducted, written up, peer reviewed, published professionally, and then permanently archived all in entirely on-line modes. Our experiences in Cyberschool suggest research, reflection, and reasoning about knowledge in almost every discipline must confront this additional dimension of virtualization in tertiary education.

Third, our virtual university by most counts is developing new disciplinary coalitions and social networks. The pervasiveness of changes brought on by computer-mediated communication is remaking the disciplinary divisions and canonical conceptualizations embedded in the deep structures of the land grant university's essentially industrial, nationalist, and scientific organization. Globalization and marketization are reshaping economies and societies, and legitimate forms of knowledge about them also are evolving in ways that no longer mesh as accurately with the existing organizational outlines of academic disciplines. Networks of knowledge production, consumption, circulation, and accumulation often nest now in professional consultancies, for-profit enterprises, and state agencies. Therefore, a market-based sense of knowledge

consumption and quick-and-dirty approach to knowledge production are reshaping what some disciplines do research on, when they do it, why they do it, and how it gets done. Virtual universities can import insights or experts from these parallel networks of investigation off-campus as well as begin to rebuild traditional on-campus faculties to emulate these new modes of research.

The virtual university can render "contact institutions" and their "credit-for-contact" models of instruction obsolete, particularly those hundreds of schools that are marginal financially or not highly regarded academically. Students attending such outmoded contact institutions could be forced to migrate elsewhere for "contact" teaching or pull down educational services from virtual universities as they need them. However, there clearly is far more to university education than seat-time in college courses, and some contact institutions will increasingly stress how they educate "the whole person." Instead of touting degrees per se, universities will highlight how college years are a time to make friends, form personal networks, meet prospective spouses, enjoy sports, and travel to exotic places. These activities are hard to virtualize, and they are integral parts of higher education. To survive, those institutions with the social prestige, cultural status, or right geographic locations will market themselves more like social status enhancers, finishing schools, or leisure resorts, and much less like major universities. Indeed, they easily could broker various virtualized courses of instruction from fast capitalist

Mode 2 suppliers, surviving by promising the best on the Net, the best people to mingle with on campus, and the best scenery off campus to would-be students.

The virtual university is a technologically feasible project at this juncture. Yet, as our Cyberschool experience suggests, there are many obdurate material practices and cultural values impeding its development. On one level, there are tremendous infrastructure requirements whose costs and complexities have not been fully grasped by most partisans of the virtual university. Fewer than fifty percent of all households in the U.S. even have one personal computer, and less than a fifth of all homes have any sort of Internet connectivity. Most existing connectivity moves at a baud rate of 28,800 or less, and practically all available bandwidth is carried over the twisted pair copper wires of some telco's cable plant. Only two political jurisdictions in the world--the Commonwealth of Virginia and the city-state of Singapore--have a fully operational and widely available ATM network up and running, because of the tremendous costs of connectivity (\$56,000 a month for a T-1 line or \$2,000 a month for an ISDN line in our area). Wireless technologies can address some of these problems, but even when the new Iridium telematic satellite network comes on-line next year it will have a basic rate of \$3 a minute for its clients--a fee structure that militates against aimless hours of websurfing.

On a second level, there is a real gap between the predicted level of use puffed up, on the one hand, by hardware producers,

telco operators, and cybertouts and the actual numbers of users, on the other hand, that show up at the virtual university's digital doorsteps. After three years of intense public relations on campus, our Cyberschool enrollments in summer 1997 barely hit 350, or an average class size of about 10 students. Off-campus interest is quite intense, but our on-line MA degree program in political science still needs F2F connections at our university's extended campus outreach sites to get enrollments. A lot of the available bandwidth on the statewide ATM system is being sold to carry voice traffic for cheap inter-agency telephone service, and new content is not being generated very rapidly either in the private sector or back on college campuses. Much of this is due undoubtedly to access costs, bandwidth limitations, and hardware shortages, but institutional barriers, cultural inertia, and professional prejudices also cannot be discounted as sources of serious resistance to virtualized instruction.

For academics, as we have found in the Virginia Tech Cyberschool, the key question raised by virtual universities essentially is "job control." The model of possible efficiencies represented by the University of Phoenix or Western Governors University mystifies an entire series of important job control issues by bundling them up with technological innovations. Choosing to go on-line with university instruction conducted through multimedia packages, at the same time, is to decide against many prerogatives now exercised by professors in F2F classroom teaching. These multimedia alternatives mostly presume

that professors simply are dispensing information in their traditional lectures and seminars, and therefore their information-dispensing efforts should be enhanced, extended, or even extinguished by technological surrogates.

Yet, these technological interventions would rob professors of much of their authority. In the near future, some assert that course syllabi should be designed and constructed by technical designers, panels of experts, or outside consultants, and then sold as mass media products on-line or in boxes by publishers. Lectures, in turn, would be automated with such multimedia replacements. Testing might be contracted out to assessment businesses, and student advising, tutorial discussions, or independent studies could be conducted by paraprofessional workers without Ph.D.s. At the end of the day, job control would be lost; and, as the educational product is increasingly commodified, the current salary structures and status systems of academic labor would be replaced by a new regime of professorial superstars whose "big names" or "great fame" would be sold in multimedia blockbusters that many lesser paraprofessionals help deliver to students in integrated markets of mass produced instruction, advising, discussion, and assessment.

This image of the future rarely is painted by academics; instead, it tends to be the fancy of corporations, like Microsoft or Intel, lobbying groups, like Educom or CAUSE, and digerati, like Nicholas Negroponte or Bill Gates. Repeating silly scholastic stories about professors making the transition from

"the-sage-on-the-stage" to "the guide-on-the-side," these simplistic narratives mobilize technological imperatives, economic necessity, or unserved markets to recast the role of professors as researchers, teachers, and service-providers.<sup>50</sup> These allegedly inexorable forces of change are, in fact, lobbying campaigns by hardware manufacturers, software publishers, telecommunications vendors, and educational consultants. Paying off of profscam mythologies of burnt-out profs rehashing canned lectures in front of bored students, this neoliberal reform wave is rethinking the role of the professor in order to sell their high-tech tools to support "wide distribution of lectures by a few famous scholars" in "customized multimedia tools" wielded by nonacademic technicians that "have a command of the technology" so "creating a course might be more like producing a Hollywood film or a video game."<sup>51</sup> At that juncture, however, job control truly would be gone, just as few novelists in Hollywood control what makes it on to the final print and fewer artists ever dictate what gets set into code on the game cartridge. Film and video games are collective arts paid for with serious money, and it is unlikely that the individual performance art of university teaching would cash out like major movies or giant games.

At this time, our cyberschooling project at VPI&SU works in the opposite register: small-scale, handicraft production for local use, not global exchange. Often one instructor is mapping his or her existing courses over to a website, generating

computer-animated overheads, or organizing multimedia demonstrations to enliven traditional contact-style teaching and/or to experiment with asynchronous learning interactions. The material still mostly is a "home-made" production for "on-campus" circulation through "in-house" means of student consumption or "on-site" centers of knowledge accumulation. Therefore, Mode 1 practices directly frame our Mode 2 innovations as our existing practices in the university, academic department, and professional discipline still capture and contain the cyberschool enterprise to suit traditional students by providing virtual flexibility and multimedia enhancements in established programs of study.

None of these constraints, however, are inevitable necessities for the virtual university. Working in new registers of medium-scale, team production or large-scale, corporate production undoubtedly will transform the current understandings of job control, working conditions, and career development shared by many academics toiling away in contemporary research universities. The development of disciplinary-software systems, such as Mathematica or Academic Systems Corporation's algebra and writing courseware, presages a curricular economy that is no longer one of handicraft work of primitive manufacture. These innovations suggest how cyberschooling at the virtual university can become a case-study in factory-like, industrial reorganization involving integrated teams of labor, outside financial investors, and high-tech multi-media design in its

creation and marketing.

Like radio in the 1920s or television in the 1950s, computer-mediated communications in the 1990s are, first, being touted as empowering, enlightening, and energizing technologies that will remake humanity and society anew, while, second, becoming enmeshed in the existing circuits of corporate commodification. As Schiller notes, "radio, for example, as did television, initially offered enormous potential for the public's health and social benefit. This has been squandered by the commercialism that has engulfed both media. This is the pattern now being extended to the electronic age."<sup>52</sup> The boosteristic enthusiasm of the Clinton-Gore regime for building the infobahn "talks the talk" of dedicated public access, but "walks the walk" of proliferating private toll roads. As Auletta asserts, commercialization is certain to hold sway in both the high-speed backbone and dense fiberoptic capillaries of the networked American economy. That is, "the Clinton administration wants the superhighway to have public channels, but it doesn't want to expend public dollars to accomplish that; it wants rigorous enforcement of anti-trust laws, yet also wants friendly relations with corporate America....obviously, such goals collide."<sup>53</sup>

Despite the rhetoric of accessibility, democracy, flexibility, participation, or utility swirling around cybernetic technologies, most networks today are, in fact, technoeconomic formations whose most characteristic qualities in actual practice are those of inaccessibility, nondemocracy, inflexibility,

nonparticipation, and disutility. Many web domains are not readily accessible, and those that are often remain nearly worthless. No one really voted to empower Microsoft, Intel, IBM or Netscape to serve as our virtual world-projectors, on-line terrain-generators, or telematic community-organizers, but they essentially act as if we did by glibly reimagining our mostly choiceless purchases in monopolistic markets as freely cast votes. Inequality and powerlessness will not disappear in the digital domain; they simply will shift their shapes and substances as human beings virtualize their cultures, economies, and societies in networked environments.

#### **4. A Closing**

On one level, the project of cyberschooling to the knowledge business simply could become one more new task in corporate market-building strategies. There are 3,600 colleges and universities, for example, in the United States alone, and 12 million FTE students are enrolled in their courses of instruction. If every department, all libraries, each dormitory, every student center, all classrooms, each faculty office, not to mention administrative and support personnel, got a personal computer installed at a level of concentration approaching one per student or one per faculty member, then millions of new product units could be sold, installed, and serviced. Being often quite rational entrepreneurs, all of the world's computer builders, software packagers, and network installers are exerting tremendous pressure on colleges and universities to open their

campuses to computerization so that these markets can be made, serviced, or conquered.

On a second level, however, the project of cyberschooling will meet stiff resistance on campus. Few faculty see the merits of computerized teaching, not all students are computer literate, and many administrators are unable to find funds to pay for all of the computers and network connectivity that the private sector wants to sell them. There are a few agents of change on campus who want to ally themselves with new economic modernizers off-campus to transform education through computerization and networking. They are aided, in part, by digital capitalists, who want to build new markets on campus for their hardware, software and netware; in part, by the digital mass media, which want to popularize wired cultures and informational communities; and, in part, by digitizing content providers in the entertainment and publishing industries who want to reconfigure or repackage their products for computer-mediated on-and-off-line delivery systems.

The sale of computer-mediated communication and multimedia to teachers, however, is not where the virtual university starts and stops. Increasingly, as the Virginia Tech Cyberschool illustrates, these technologies are being introduced into the practices of university administration, which can force very closed, hierarchical, and bureaucratic institutional structures to become more open, egalitarian, and consensual sites of collective decision-making. On-line information sources, self-paced on-line application forms, and user-oriented on-line

records management can take access to information out of the hands of special administrative personnel and hand it over to the faculty and students who actually are using it to coproduce educational services. Universities could retain their older, closed bureaucratic structure, but their executive leadership can choose to restructure them as looser, flatter and more responsive entities by deploying more computer-mediated communication technology. A virtual university, then, does not necessarily represent business as usual plus some computer multimedia. Instead, it also can mark the arrival of far more fundamental changes, which give everyone on campus an opportunity to rethink and rebuild what they are now doing.

Computer-mediated communication and multimedia also are beginning to press our print-centered understandings of academic research to the limit. Learned discourse already is adapting to the on-line salon of e-mail exchanges, chat rooms, use groups, and list serves in ways that are accelerating the diffusion of research results, broadening access to scholarly debate, redefining the agendas of research programs, and eroding the closed authority of disciplinary experts. Similarly, conventional understandings of research authorship and fixed documents are decaying as multimedia products are marked up, laid out, and recoded by tens, if not scores, of people to communicate what an author with one editor might have said a decade ago in a print book. The collective collaboration of software firms, original programmers, and first users in debugging beta versions

of software is becoming a more common model of "author-ing" and "document-ing" scholarship in many research areas. Hypertexts links and multimedia imports are animating, enlivening, and varying once fixed, firm, and final print artifacts in ways that most professional codes of judgement for editorial refereeing, tenure reviews, and promotion reassessment have not begun to address. Likewise, the archival qualities of the WWW, dedicated databases, or a specialized digital library all challenge existing notions of scholarly evidence, ranging from traditional concerns about permanence, veracity, and trustworthiness to current worries about access, cost, and usefulness.

Consequently, successful virtual universities are not simply what we have always been doing in research plus a few shareware-based electronic journals. On the contrary, research and publication in the digital domain increasingly represent moves toward new types of discourse, innovative changes in the scholarly document, and shapeshifting alterations in many traditional disciplines.

None of these changes are foreordained, and the ultimate outcome for tertiary education might not meet the most optimistic projections of their backers off-campus nor attain the most pessimistic fears of their opponents on-campus. The project of cyberschooling in traditional institutions to recreate them as virtual universities is a new social movement. It must organize successfully the winning of victories on campus amidst an unstable context of complex contingencies: it might very well fail to win such triumphs. Likewise, countermovements elsewhere

in society might redirect, retard or resist widespread computerization and extensive connectivity. Still, those who would have cyberschooling constitute the virtual university must be cautious in their campaigns for change. Otherwise, all of the Mode 1 traditions of university life be jettisoned today as being non-performative tomorrow. As Gilbert claims, "existing universities must assimilate the new communications technologies, and with the utmost effectiveness seek to use the enormous benefits that 'the digital revolution' promises for the advancement of teaching, learning, research and communications generally."<sup>54</sup> Gilbert is right, but it is how they assimilate them, when they do it, and who will be served that actually is what matters most. Whatever happens, universities should not forsake their historic Mode 1 knowledge production and consumption functions, namely, the cultivation of "a learning community in which students, teachers, researchers and scholars share a common commitment to rational inquiry, and through it to the creation, advancement, preservation and application of knowledge."<sup>55</sup> No one familiar with the corporate culture of Disney, Sony, or AT&T really can believe that they would preserve and protect free rational enquiry in the same ways as most universities. The virtual universities that such mega corporations might build only would be "virtually" universities, providing what is at best only seemingly real education or apparently substantial research rather than providing something of enduring value. Universities must be more than shell

buildings for the knowledge business where outsourced academic workers reskill and refresh global corporations' downsized/outsourced/overworked white-collar proletarians. The traditional roles of the university as a knowledge collector/preserver/interpreter/protector should, and can be, performed virtually, but not all of these functions will be very profitable markets for "the knowledge business." Consequently, a virtual university must adapt its discourses and disciplines to these digital domains and continue its familiar Mode 1 missions without becoming only virtually a university hussling with everyone else in the Mode 2 knowledge trade.

Those who find the University of Phoenix or the Western Governors University to be worthy models for all universities to emulate are skating dangerously close to that edge of disaster where computer-mediated virtualization laps over into a trade in simulated quasi-qualifications, seeming acceptability, or superficial emulation. In other words, these thin, for-profit, and downsized universities would only appear to be adequate, real, or substantial, but they will not be able to perform the historic tasks of higher learning that universities always have aspired to perform. A university without a dedicated, full-time faculty, a commitment to state-of-the-art research, a collection of excellent library resources, a willingness to support publishing houses or scholarly journals, and an acceptance of impractical, risky or hypothetical thinking by a dedicated community of learners cannot pretend to be a university in

anything other than a name. As the experiments of the Virginia Tech Cyberschool illustrate, however, a virtual university does not need to be a second-rate enterprise.

The neoliberal agenda for the virtual university must not be mistaken for the only path to the future of tertiary education. In fact, much of its promise for restructuring actual universities is illusory. Digitalization does not save money, reduce work force levels, accelerate progress toward degrees, or lower overhead. Every indication thus far suggests instead that costs increase with digitalization, work forces increase in size and responsibility, degrees actually may not be taken at all, while progress through programs can slow, disciplinary divisions blur, and overhead expenditures for more bandwidth, server capacity, and software development rise rapidly. Nonetheless, the quality of this higher education can be much greater, and the nature of tertiary education therefore has shifted profoundly. Here, the political economy of the virtual university simply responds immediately and concretely to the political economies of the virtual office, factory, and marketplace that are consolidating their power and profitability in the New World Order.

## References

1. See Michael Gibbons et al., The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies (Sage: London, 1994), pp. 1-16.
2. See Scott Lash and John Urry, Economies of Signs and Space (London: Sage, 1993).
3. For more discussion of VPI&SU's CyberSchool, see <http://www.cyber.vt.edu/docs/papers.html>.
4. For some sense of "the culture wars," see Lynne V. Cheney, Telling the Truth: Why Our Culture and Our Country Have Stopped Making Sense -- What We Can Do About It (New York: Simon & Schuster, 1995); and, Todd Gitlin, The Twilight of Common Dreams: Why America is Wracked by Culture Wars (New York: Henry Holt, 1995).
5. For full disclosure of many of such misimpressions from their original source, see Allan Bloom, The Closing of the American Mind: How Higher Education Has Failed Democracy and Impoverished the Souls of Today's Students (New York: Simon and Schuster, 1987); Charles J. Sykes, Profscam: Professors and the Demise of Higher Education (New York: Kampmann and Co., 1988); Peter Shaw, The War Against the Intellect: Episodes in the Decline of Discourse (Iowa City: University of Iowa Press, 1989); Roger Kimball, Tenured Radicals: How Politics Has Corrupted Our Higher Education (New York: Harper and Row, 1990); Page Smith, Killing the Spirit: Higher Education in America (New York: Viking, 1990); Charles J. Sykes, The Hollow Men: Politics and Corruption in Higher Education (Washington, D.C.: Regnery Gateway, 1990); Dinesh D'Souza, Illiberal Education: The Politics of Race and Sex on Campus (New York: Free Press, 1991); William J. Bennett, The De-Valuing of America: The Fight for Our Culture and Our Children (New York: Summit Books, 1992); Martin Anderson, Impostors in the Temple: American Intellectuals Are Destroying Our Universities and Cheating Our Students of Their Future (New York: Simon and Schuster, 1992); and, Robert H. Bork, Slouching Towards Gomorrah: Modern Liberalism and American Decline (New York: Harper Collins/Regan Books, 1996).
6. In the Commonwealth of Virginia, the federal government pays 6 percent of the costs of public education, Richmond and the state's various local and county governments almost exactly split the other 94 percent down the middle. Higher education costs come almost exclusively from tuitions and grants, while state subsidies now often account for less

- than 30 percent of annual budgets to the universities, although federal research dollars, corporate contracts, and private giving are increasingly significant sources of funding. See The Roanoke Times (October 6, 1996), pp. A1, A5.
7. George P. Schmidt, The Liberal Arts College: A Chapter in American Cultural History (New Brunswick: Rutgers University Press, 1957), pp. 56-56.
  8. See The Washington Post (September 26, 1996), p. A3; and, The Chronicle of Higher Education, XLIV, no. 6 (October 3, 1997), A49.
  9. Ibid.
  10. The Washington Post (September 17, 1996), p. A1, A22. In 1980, federal funds for education roughly was divided 50/50 between outright grants and individual loans. During 1995, 75 percent of student aid was given out as loans. See Ben Gose, "Undergraduate Tuition Rises by an Average of 5%," The Chronicle of Higher Education, XLIII, no. 6 (October 4, 1996), A38.
  11. Ibid. Over 70 percent of all colleges and universities charge less than \$6,000 a year in tuition, but even so this figure is still over 20 percent of the average family's yearly income or nearly 45 percent of the annual income of a poverty level family. See Gose, "Tuition Rises," p. A38.
  12. The Washington Post (September 16, 1996), A3.
  13. Ibid.
  14. See Robert Reich, The Work of Nations: Preparing Ourselves for 21st Century Capitalism (New York: Knopf), pp. 110-118.
  15. Fredric Jameson, Postmodernism or, The Cultural Logic of Late Capitalism (Durham: Duke University Press, 1991), p. 54.
  16. David Harvey, The Condition of Postmodernity (Oxford: Blackwell, 1989), pp. 294, 296.
  17. Jean-Francois Lyotard, The Postmodern Condition: A Report on Knowledge (Minneapolis: University of Minnesota Press, 1984), p. 46.
  18. Lyotard, Postmodern Condition, pp. 44-46.

19. Gibbons et al., New Production, pp. 2-3.
20. Ibid. Also see Stan Davis and Jim Botkin, The Monster Under the Bed: How Business is Mastering the Opportunity of Knowledge for Profit (New York: Simon & Schuster, 1995).
21. For more discussion, see Rajiv Chandrasekaran, "Where the Jobs Are...", The Washington Post (October 11, 1996), A1, A20-21. And, for the university response, see Putting Knowledge to Work: Virginia Tech (Blacksburg, VA: VPI&SU, 1996) in which my university is cast not as an ossified leftover of culturally concentrated mystification but rather as one with "a focused, practical...pursuit of knowledge...producing ideas and innovations that are the raw material of today's product-driven economies," p. 1.
22. Michael J. Piore and Charles F. Sabel, The Second Industrial Divide (New York: Basic Books, 1983); or, Peter Evans, Embedded Autonomy: States & Industrial Transformation (Princeton: Princeton University Press, 1995).
23. See Guy Webster, "Building an Education Empire: Adult School Made Modern by Phoenix U.," The Arizona Republic (August 18, 1996), B1, B4.
24. See <http://www.uophx.edu/index.html>.
25. Guy Webster, "Market Makes Role Mode of Renegade: Other Schools Copy Some of Sperling's Methods," The Arizona Republic (August 18, 1996), B1, B5.
26. Webster, "Building an Education Empire," B4.
27. See <http://www.uophx.edu/index.html>.
28. See <http://www.uophx.edu/index.html>.
29. See <http://www.uophx.edu/index.html>.
30. See <http://www.uophx.edu/index.html>.
31. See <http://www.westgov.org/smart/vu/vu.html>.
32. See <http://www.westgov.org/smart/vu/vu.html>.
33. See <http://www.westgov.org/smart/vu/vu.html>.
34. See <http://www.westgov.org/smart/vu/vu.html>.
35. See <http://www.westgov.org/smart/vu/vu.html>.

36. See <http://www.westgov.org/smart/vu/vu.html>.
37. See <http://www.westgov.org/smart/vu/vu.html>.
38. See <http://www.westgov.org/smart/vu/vu.html>.
39. See <http://www.westgov.org/smart/vu/vu.html>.
40. See <http://www.westgov.org/smart/vu/vu.html>.
41. See <http://www.westgov.org/smart/vu/vu.html>.
42. See <http://www.westgov.org/smart/vu/vu.html>.
43. President Paul E. Torgersen, "Preface," Update to the University Plan, 1996-2001 (Blacksburg, VA: VPI&SU, 1996), pp. 3-4.
44. Webster, "Building an Education Empire," B4.
45. See <http://www.vto.edu/>
46. The Roanoke Times (October 3, 1996), C1, C5.
47. See Adam Smith, The Wealth of Nations (Chicago: University of Chicago Press, 1976), pp. 283-302.
48. Ibid., pp. 302-303.
49. Ibid., p. 303.
50. See Educom's claims at <http://educom.edu>, and CAUSE at: [cause-www.colorado.edu/](http://cause-www.colorado.edu/).
51. See Jeffrey R. Young, "Rethinking the Role of the Professor in an Age of High-Tech Tools," The Chronicle of Higher Education, XLIV, no. 6 (October 3, 1997), A27.
52. Herbert I. Schiller, Information Inequality: The Deepening Social Crisis in America (New York: Routledge, 1996),
53. Ken Auletta, "Under the Wire," The New Yorker, 70 (January 17, 1994), 52.
54. Alan Gilbert, "The Virtual University," at <http://www.edfac.unimelb.edu.au/virtu/text1.html>.
55. Ibid.