

Employment at the Margins: Nonstandard Work in Higher Education

By Henry Lee Allen

Henry Lee Allen is associate professor of sociology at Wheaton College. He continues his research on the organizational dynamics of academic systems, focusing on the academic professions, labor markets, and the future of academic work.

An active consultant outside higher education, Allen is developing a national research center for the study of urban youth. He is also working on a curriculum development project under the auspices of the Behavioral Science Unit at FBI Academy.

The challenge before state, federal, and institutional leaders in higher education is to respond to a turbulent political economic environment while preserving the role of nonprofit and nonmarket provision of higher education in service of the public good.¹

Our nation is drifting into complacency concerning its core human capital. Public policy makers have given inadequate attention to the fate of the academic professions, and to the challenges faced by all professors.² Faculty members, these days, are considered peripheral, or at best, instrumental. Proactive policies regarding faculty employment and the organizational climate nurturing faculty productivity are ignored or disregarded.

While higher education becomes more consumerist, society becomes more complex, diverse, unequal, and globalized. Will higher education confront the implications of these changes? Are college administrators aware of the consequences of acquiescing to corporate norms and practices?³ Are colleges exploiting their faculty members? Is there a limit to the hours in a week faculty members can productively devote to teaching, advising, research, administration, and public service? Are tenured faculty insulated from the effects of privatization? (Not if one divides salary and compensation by average number of hours worked per week!)

The fate of the academic profession is on the line. Professors know that changes in internal demands, including the particularities of organizational culture, and in external conditions, especially within industries, occupations, and professions, affect their careers. But the causal link remains nebulous. Many also wonder if the regular full-time faculty role will cease to exist. If so, why, and what can be done about it?

Answering these questions means examining organizations, markets, and social systems.⁴ Colleges vary in governance structures, faculty composition, tenure rates, size of departments, and ratio of administrators to faculty members. Their cultures vary in allocated resources, intangible tastes, leadership, innovations, curricula, enrollments, retention, and programs. Differentiation likewise occurs within and between the social networks in all institutions.⁵

Researchers now focus on the diffusion of nonstandard faculty employment, just as scholarship on other organizations and labor markets emphasizes the effects of contingent labor.⁶ Others examine how managerial fads and incentives—including the use of nonstandard work—affect academic outcomes.⁷ Nonstandard work, research suggests, has been eroding full-time employment for decades. Part-time or temporary faculty disproportionately staff community colleges, but administrators in many four-year colleges and universities have also replaced full-time tenured positions with nonstandard appointments to reduce operating costs. This trend, if unabated, may lead to the demise of full-time academic employment in many sectors.

This article explores the diffusion of nonstandard work throughout U.S. postsecondary institutions. Regular faculty members must grasp the factors accounting for the marginalization of academic work—factors that are often obscured or relegated to the periphery of public policy concerns. We rely on reports published by the National Research Council under the auspices of the National Academy of Sciences, and on data from the National Study of Postsecondary Faculty (NSOPF-99) to examine long-term trends, differences associated with institutional types, and faculty composition.⁸

EDUCATIONAL AND SOCIAL TRENDS

Rapid change is engulfing postsecondary institutions.⁹ Replacement of older faculty by younger colleagues is changing the demography of the professoriate. Global, industrial, and technological transformations, mediated by economic markets, affect disciplinary supply and demand.¹⁰ The digital revolution has infiltrated academic life.¹¹ Politicians and ideologues have produced often contradictory or inept public policies.¹² The result: volatile funding schemes, changing accountability regimes, and performance indicators.¹³ Assessment reigns.

Meanwhile, society has become more complicated, its citizens more diverse. Immigration increases, though the role of foreign students—especially those enrolled in scientific studies with implications for national security—remains unsettled after September 11.¹⁴ The

K-12 educational system adopts national standards (under duress), and deficit-plagued state governments face escalating costs for prisons, healthcare, and retirement benefits.¹⁵

Let us briefly explore the factors shaping the policy context that is determining the use of nonstandard work in higher education.

The digital revolution

The future of postsecondary education lies in a precarious balance as the digital revolution unfolds.¹⁶ We can harness the benefits of rapid technological advancements in digital computers, portable information access and retrieval mechanisms, and visual displays, to increase productivity and enhance learning. Computer networks link disparate and isolated research and learning environments, while promoting the rapid diffusion of knowledge, open exchange of information, and forms of distributed intelligence.

Virtual communities plus digital systems, proponents claim, will replace classrooms. Nontraditional, part-time students with hectic schedules or work- or family-related impediments, they add, will profit from access to virtual campuses. But challenges and unintended consequences accompany these opportunities. Institutions and academic disciplines interact with the digital revolution at differing paces. Successful change depends on resources, organizational leadership, and expertise. Success also depends on adequate funding—not a “given” at a time of recession and diminished public subsidies—and on successful adjudication of intellectual property issues.

Some proponents dismiss these concerns, seeing universities as obstructive, sacerdotal temples of antiquated curricula, obsolescent pedagogy, pretentious professors, bureaucratic rituals, and noncompetitive markets. But others insist the problems are real. The digital revolution, one observer alleges, undermines traditional information flows, facilitates alternatives to current academic structures, including “marketspaces,” and enhances the “value chain” of learning.¹⁷ Academic institutions must “unbundle” their functions, restructure their calendars, and develop global learning infrastructures. Traditional postsecondary institutions that fail to adjust to the global knowledge economy, this observer warns ominously, will lose influence.

The digital revolution—especially distance education—can improve access to postsecondary education and expand lifelong learning via inter-institutional alliances. Remaining unclear is how information technology can move from transmitting codified knowledge toward producing new esoteric knowledge or the intangible qualitative understandings emerging from spontaneous classroom interactions.

The challenge of public policies

Who safeguards the national interest in our universities and colleges? Who weighs short-term versus long-term considerations, or public versus private interests? What protections exist for faculty? Who decides the organizational setting of academic employment? Who determines how government influences academic careers? Who may enter this debate? So far, there is no accountability regarding these policy questions.

The public role of higher education, claims Brian Pusser, has already eroded; Americans view college as a commodity subject to vagrancies of the marketplace, not as a public good. Pusser cites four drawbacks to seeing market reforms as solving the problems confronting postsecondary education:¹⁸

1. Public higher education is not a market-based commodity; it is an integral feature of nonprofit industries that safeguard the public interest.
2. Advocates of market imperatives ignore the historical imperatives that maintained the nonprofit status of postsecondary education.
3. Market-oriented enthusiasts obscure the uncertainties and irreplaceable qualitative costs of markets, and their inability to foster equality of opportunity or enhance public capital.
4. Market proponents cannot measure or extrapolate the noneconomic and contingent benefits of higher education.

Pusser sees postsecondary institutions as nonprofit entities that produce an invaluable public good. But the market discourse advanced by many privatizers and by commercial interests incites the public. These pundits and concerned parties are rarely punished for their failed policies.

The challenge of social diversity

The growing diversity of the current American population, combined with immigration, affects all educational institutions.¹⁹ Many scholars expect ethnic minorities to become the majority by 2050.²⁰ The U.S. has reduced the gaps in educational attainments and the distribution of occupational statuses between ethnic groups. But acute disparities remain in the accumulation of income, distribution of wealth, and quality of educational attainments.²¹ Colleges and universities cannot remain oblivious to at-risk children, ethnic disparities, poverty rates, violence, and ineffective social institutions. Nor can they avoid the grassroots issues involving curriculum, student assessment, collaborative learning, and mathematical, scientific, linguistic, and technological literacy. Affirmative action remains relevant to incorporating this diversity in higher education.²²

The challenge of K-12 policies

Standardized tests became benchmarks of educational progress under the current national administration. The administration placed less emphasis on standardizing the social contexts of schools or their organizational resources. Current political ideologies have shifted national priorities so that the practices of K-12 schools permeate upward toward colleges and universities.²³ The community college, observers note, is a prime locus of intersection for all these transformations.²⁴

The challenge of misguided leadership

No national standards have been adopted for political leaders or elected officials that match the consequences of their policies to their claims. No think tanks measure the actual or differential impact of legislative decisions across time. No accreditors evaluate constituent contact hours, assess legislator competence in representing the collective interests of their jurisdictions, or certify the productivity or workloads of public officials who supervise postsecondary education. Absent such assessments, political leaders lack moral credibility in the eyes of victims of poor social policies.

If these accrediting standards or performance indicators existed during prior decades, members of the academic professions and others affected by inept or negligent higher

education policies could claim malpractice. Manufacturers are liable for the consequences of their products, and executives are liable for ruining companies. Elected officials should subject their own performance (and voting records) to the same high professional standards they impose upon educators. Many years ago, wise citizens instructed us that safeguarding democratic principles required eternal vigilance; a generation ago, Dr. Martin Luther King, Jr. warned us to beware of misguided leaders. But there is a deafening silence about these ethical and professional issues.

TRENDS IN NONSTANDARD WORK, 1970–2000

In 1969, part-time faculty members made up about 22 percent of the total instructional staff in American higher education.²⁵ Colleges substantially reduced full-time faculty employment during the 1970s; the proportion of part-time faculty increased from 22 to 34 percent between 1970 and 1980. The 1980s brought only a two percent increase—from 34 to 36 percent. During the 1990s, the proportion of part-time faculty increased by seven percent—from 36 to 43 percent. Nonstandard work thus rose monotonically, but the rate of increase varied across decades.

Since 1970, the proportion of part-time faculty increased almost 100 percent; full-time employment decreased 21 percent.

Table 1 suggests a diffusion process involving nonstandard work at colleges and universities.²⁶ The path resembles a logistic curve (Figure 1). During the initial State 0, full-time faculty employment dominated (>75 percent), and nonstandard work showed only minor diffusion. During State 1 employment statuses approached parity (50 percent each full-time and part-time), and diffusion occurred more rapidly in some sectors than in others. During State 2 nonstandard work would become dominant (>51 percent), and would affect nearly all members and sectors.

Before 1970, the American academic system existed in State 0 (about 65 percent of professors had full-time jobs as late as 1980 despite the 1970s spurt in nonstandard positions). But by 2000, the system approached State 1 (50-50). State 2 may be inevitable for the academic professions, unless tenacious policy efforts abate the trend.

The failure the leaders of an industry to think systemically—to demonstrate vision beyond their immediate environs—about the marginalization of full-time faculty can lead to catastrophe.²⁷ Inattention to these trends suggests the lack of systemic thinking about

Table 1

Faculty Employment Status: 1970–2000

Year	Total Faculty	Total Full-Time Faculty	Proportion of Full-Time Faculty	Total Part-Time Faculty ¹	Proportion of Part-Time Faculty
1970	474,000	369,000	78%	104,000	22%
1975 ²	628,000	440,000	70	188,000	30
1980 ²	686,000	450,000	66	236,000	34
1985 ²	715,000	459,000	64	256,000	36
1990 ²	824,000	524,000	64	300,000	36
1995	932,000	551,000	59	381,000	41
2000	1,028,000	591,000	57	437,000	43

Source: NCES, Table 228.—Full-time and part-time instructional faculty in degree-granting institutions, by employment status, control, and type of institution: Fall 1970–Fall 1999; U.S. Department of Education, National Center for Education Statistics, *Employees in Institutions of Higher Education, various years; Projections of Education Statistics to 2000; Integrated Postsecondary Education Data System (IPEDS), "Fall Staff" surveys; and U.S. Equal Employment Opportunity Commission, Higher Education Staff Information (EEO-6) Survey, 1977, 1981, and 1983. (This table was prepared July 2001).*

¹Excludes graduate students.

²Estimated based on enrollment data; 2000 figures based on 1999 estimates.

Figure 1**A Heuristic Model Depicting the Diffusion of Nonstandard Work**

	Full-time Employment	Part-time Employment
State 0	>75% of total jobs	<25% of total jobs
State 1	50% of total jobs	50% of total jobs
State 2	<50% of total jobs	>50% of total jobs

the future of faculty careers. Many of the academy's luminaries have offered little leadership. We cannot stop the diffusion of nonstandard work, but we can address its consequences.

EMPLOYMENT STATUS AND INSTITUTIONAL DIFFERENTIATION

Table 2 depicts the distribution of employment statuses by institutional type for approximately 95 percent of full-time faculty members and 93 percent of part-timers. About 560,000 full-time and 416,000 part-time faculty members had jobs in 1998. Public research institutions employed about 138,000 full-time faculty members (25 percent) and another 36,000 faculty members (nine percent) in nonstandard jobs. Public research universities (25 percent), public community colleges (18 percent), and public comprehensives (15 percent) had about three-fifths of all full-time faculty. Only community colleges and public comprehensives reported double-digit proportions of part-timers. It is in the public sector, subject to the whims of politics, that even partial solutions to the plight of faculty have been most elusive.

Table 3 notes the distribution of faculty in each employment status within institutional types. Full-timers predominated at public research universities: about 79 percent vs. 35 percent at public community colleges. Conversely, part-timers predominated at public community colleges: 65 percent vs. 21 percent at public research universities. Half the faculty members at independent doctoral and independent comprehensive institutions held part-time slots.

Returning to our diffusion model, public research, independent research, and public doctoral institutions still belong in State 0.

Public comprehensive, independent liberal arts, independent doctoral, and independent comprehensive institutions are most appropriately classified in State 1. Public community colleges, with their high proportions of part-time faculty, are in State 2, and may have reached the point where the contagion of nonstandard work cannot be curtailed.

The proliferation of contingent faculty positions may have serious consequences for students attending community colleges. These colleges enroll nearly half of all undergraduates—with for-credit enrollments actually greater than their baccalaureate counterparts—though enrollments declined slightly from their 1990s peak. Community colleges lead in dealing with nontraditional students via open access, distance education, transfer programs, noncredit courses, occupational programs, and developmental (remedial) studies. These institutions serve an overrepresentation of minorities, immigrants, and first-generation students from low socioeconomic origins. They have been increasingly affected by reduced governmental allocations. To this list of challenges, we would add: the precarious status of full-time faculty jobs.²⁸

Where you work in postsecondary education matters—especially by type of control and of institution. Scholars must ask how organizational changes, policy initiatives, and market transformations influence full-time faculty employment, and the growth of nonstandard work in each sector. Community colleges are key to exploring both statuses. Their ubiquity (Table 2) gives them a large proportion of all full-time faculty members, while nonstandard employment is more frequent within them (Table 3).

What the enterprise entails—one's academic discipline—also matters in regular and

Table 2**Employment Status by Type of Institution, Fall 1998**

Fall 1998 (NCES)	Public Research	Independent Research	Public Doctoral	Independent Doctoral	Public Compre- hensive	Independent Compre- hensive	Independent Liberal Arts	Public Two-year
Full-time faculty (560,000)	138,000 25%	39,000 7%	58,000 10%	21,000 4%	83,000 15%	38,000 7%	48,000 9%	102,000 18%
Part-time faculty (416,000)	36,000 9%	15,000 4%	26,000 6%	18,000 4%	48,000 12%	37,000 9%	33,000 8%	170,000 41%

Source: NCES, Table 231. (June 2001)—Full-time and part-time instructional faculty and staff in degree-granting institutions, by type and control, academic rank, age, salary, race/ethnicity, and sex: Fall 1998.

Note: This table excludes institutions of higher education classified as "Other."

Table 3**Percentage Distribution of Faculty by Employment Status and by Type of Institution, Fall 1998**

Fall 1998 (NCES)	Public Research	Independent Research	Public Doctoral	Independent Doctoral	Public Compre- hensive	Independent Compre- hensive	Independent Liberal Arts	Public Two-year
Full-time faculty	79%	69%	72%	49%	64%	50%	63%	35%
Part-time faculty	21%	31%	28%	51%	36%	50%	37%	65%

Source: NCES: Quick Tables and Figures. Percentage Distribution of Faculty, by Employment Status and by Type and Control of Institution, Fall 1998.

nonstandard work. Table 4 shows the distribution of employment statuses within academic fields. Each cell contains the estimated number of full-time faculty in each area of study, followed by its proportion in each respective employment status. For instance, there were 10,500 full-time positions in agriculture and home economics—approximately two percent of all full-timers.

Full-time faculty members were more likely to be employed in the natural sciences (111,300 or 20 percent), health professions (83,800 or 15 percent), and the humanities (80,800 or 15 percent). The natural and social sciences provided most full-time employment in postsecondary education. Together, the social sciences (58,400) and engineering (25,000), combined with the natural sciences and health fields, accounted for 278,500 faculty positions, about half of all full-time appointments! A miscellaneous, residual category (78,700) dwarfed the remaining

academic fields, such as education (39,900), business (38,700), and fine arts (33,300).

Part-time employment predominated in the humanities (74,100 or 18 percent), followed by the residual category (71,600 or 17 percent), and the natural sciences (65,500 or 16 percent). Double-digit proportions of nonstandard work are evident the health-related fields (12 percent) and the social sciences (10 percent). Part-timers appeared less frequently in applied areas such as business, education, and engineering. Only in the fine arts did the total number of part-time faculty (38,100) exceed the number of full-timers (33,300). Small gaps existed between full-time and part-time faculty in business, education, and the residual category; these categories may be approaching a 50-50 ratio between employment statuses.

Policies regarding nonstandard work must be adjusted to the realities of disciplinary, as well as institutional context. Some fields are particularly susceptible to the encroachment

Table 4**Distribution of Faculty Employment Statuses by Academic Field, Fall 1998**

Fall 1998 (NCES)	Agriculture and Home Economics	Business	Education	Engineering	Fine Arts	Health	Humanities	Natural Sciences	Social Sciences	Other
Full-time faculty (560,000)	10,500 2%	38,700 7%	39,900 7%	25,000 4%	33,300 6%	83,800 15%	80,800 15%	111,300 20%	58,400 10%	78,700 14%
Part-time faculty (416,000)	2,500 0.6%	31,600 8%	33,600 8%	9,300 2%	38,100 9%	48,700 12%	74,100 18%	65,500 16%	41,200 10%	71,600 17%

Source: NCES: Table 232. (July 2001)-Full-time and part-time instructional faculty and staff in degree-granting institutions, by faculty characteristics and field: Fall 1992 and Fall 1998.

Note: Totals may not sum 100% due to survey item nonresponse and rounding.

of nonstandard work; and qualitative research could ascertain how employment statuses are filtered via institutional and disciplinary cultures and structures.

EMPLOYMENT STATUS AND DIVERSITY

What is the gender and ethnic distribution of college faculty? Tables 5-7 show the gender and ethnic distribution, respectively. Male full-time faculty members were disproportionately located in engineering (91 percent), agriculture and home economics (80 percent), and the natural sciences (75 percent). Women faculty members exceeded or approached parity in education (57 percent), health professions (50 percent), and the humanities (44 percent).

A different pattern emerged for part-time employment. Female faculty members exceeded parity in education (72 percent), agriculture and home economics (65 percent), health fields (59 percent), humanities (56 percent), and fine arts (51 percent). We thus observe a disproportionate association between gender and nonstandard work (Table 5). If employment status is bifurcated according to regular, full-time versus nonstandard, part-time faculty appointments, it is also characterized by a split labor market—according to patterns of gender differentiation—within many areas of study. But Table 5 also suggests a trend toward parity between female and male part-timers in some fields.

What is the ethnic distribution of full-time and part-time faculty (Tables 6 and 7)? Four decades of affirmative action, and five decades after *Brown v. Board of Education* (1954), minority faculty members have only a token presence among full-time faculty—less than ten percent in most cells.²⁹ The National Academy of Sciences has focused on diversity concerns within the healthcare professions.³⁰ Citing the need for increased diversity in many fields due to declining minority enrollments, scholars have probed empirical research regarding the effectiveness of testing, rates of educational attainments, barriers to access, the pipeline problem, appropriate affirmative action initiatives, strategic alliances, and other matters.³¹ This research, and the updated strategies derived from the results, should be extended to all academic professions.

IMPLICATIONS AND CONCLUSIONS

What is the current state of academic work, and of full-time academic employment? What is the prognosis for academic employment if current trends continue? Surveys repeatedly indicate that full-time faculty members averaged 53-hour workweeks across all types of campuses in fall, 1998—49 hours for community college faculty at the low end. But full-time faculty representation in higher education has waned despite their hard work.

Table 5**Gender Distribution of Faculty Employment Statuses by Academic Field, Fall 1998**

Fall 1998 (NCES)	Agriculture and Home Economics	Business	Education	Engineering	Fine Arts	Health	Humanities	Natural Sciences	Social Sciences	Other
Full-time male faculty (357,000)	80%	65%	43%	91%	68%	50%	56%	75%	68%	67%
Full-time female faculty (203,000)	20	35	57	9	32	50	44	25	32	33
Part-time male faculty (217,000)	35	62	28	96	49	41	44	63	55	62
Part-time female faculty (199,000)	65	38	72	4	51	59	56	37	45	38

Source: NCES: Table 232. (July 2001)-Full-time and part-time instructional faculty and staff in degree-granting institutions, by faculty characteristics and field: Fall 1992 and Fall 1998.

Note: Totals may not sum to 100% due to survey item nonresponse and rounding.

Table 6**Ethnic Distribution of Full-time Faculty by Academic Field, Fall 1998**

Fall 1998 (NCES)	Agriculture and Home Economics	Business	Education	Engineering	Fine Arts	Health	Humanities	Natural Sciences	Social Sciences	Other
American Indian/ Alaskan Native	1%	1.3%	0.8%	0.6%	0.6%	0.7%	0.4%	0.3%	1.3%	1%
Asian/ Pacific Islander	3	5	4	16	2	2	6	5	8	3
Hispanic	1	2	3	4	1	3	7	3	3	3
Black, non-Hispanic	4	5	9	2	7	4	5	3	7	6
White, non-Hispanic	91	87	84	77	89	86	84	86	84	87

Source: NCES: Table 232. (July 2001)-Full-time and part-time instructional faculty and staff in degree-granting institutions, by faculty characteristics and field: Fall 1992 and Fall 1998.

Note: Totals may not sum to 100% due to survey item nonresponse and rounding.

Table 7**Ethnic Distribution of Part-time Faculty by Academic Field, Fall 1998**

Fall 1998 (NCES)	Agriculture and Home Economics	Business	Education	Engineering	Fine Arts	Health	Humanities	Natural Sciences	Social Sciences	Other
American Indian/ Alaskan Native	<0.5%	<0.5%	2%	1%	1%	1.4%	1.3%	0.5%	1%	1%
Asian/ Pacific Islander	7	2	1	8	1	4	4	4	1	4
Hispanic	4	1	4	11	3	2	6	2	5	4
Black, non-Hispanic	1	5	5	5	3	3	3	6	8	4
White, non-Hispanic	88	91	89	75	92	90	87	87	85	86

Source: NCES: Table 232. (July 2001)—Full-time and part-time instructional faculty and staff in degree-granting institutions, by faculty characteristics and field: Fall 1992 and Fall 1998.

Note: Totals may not sum to 100% due to survey item nonresponse and rounding.

The welfare of the academic professions has always been complicated.³² The battle over employment at the margins has raged for decades at community colleges and other public sector institutions. There have been struggles with diversity and affirmative action with token progress. A crisis lies behind the debates over tenure, workload and productivity, and the role of faculty with respect to undergraduate instructional duties—the consequence of inactivity, neglect, and indifference—even as nonstandard work has proliferated among disciplines and departments. Absent systemic thinking and coordinated action, the status of the academic profession is precarious.

Higher education has few persuasive advocates to proclaim and defend the unique contributions of the academy. Former Harvard president Derek Bok, an exception, has raised serious concerns about the current state of higher education. “By trying to acquire more money for their work,” he notes, “universities may compromise values that are essential to the continued confidence and loyalty of faculty, students, alumni, and even the general public.”³³ Bok advocated embracing helpful market-based innovations while fighting to

preserve core academic norms and functions. We would extend this advice to finding ways to safeguard full-time employment for future generations of academics.

Preserving the academic profession is an urgent national priority.³⁴ Politicians must be concerned with the nation’s human capital and technological prowess in the global marketplace.³⁵ Replacing the human capital nurtured by university and college faculty—especially full-time faculty—would be an impossible task. Citizens must be concerned with maintaining a high quality of democracy and a high standard of living brought about by an educated life. Faculty must be concerned with reaching their highest potential in teaching, research, and service. Academic administrators must be concerned with fostering productive organizational cultures.

We are not indicting nonstandard workers; we must care about *all* productive professors. Part-time and temporary faculty members are instrumental to the survival of the academic enterprise. We must work to improve their working conditions and enhance their status and rewards even as we upgrade full-time employment.

Collective bargaining is crucial to facilitating such an upgrade in the current off-adversarial circumstances. Absent the hard-won rights to tenure and academic freedom, all faculty members are just a few steps away from exploitation. Unions must continue to negotiate and agitate to assure that education remains a vital resource and national priority. Given the escalating costs of living, especially health care, and given global competition from other occupations, no one else currently gives priority to faculty concerns.

How can we arrest the decline of the academic profession in an era of virtual communities, for-profit lobbying, market worship, shrinking fiscal resources, and popular misunderstanding? Here are two suggestions. First, why not institute collaborations among the National Academy of Sciences, disciplinary associations, academic representatives, foundation leaders, government officials, faculty unions, and foreign representatives to strengthen the academic professions, especially full-time employment?

Second, we must generate more sophisticated research about academic systems, organizations, and disciplines, and about the social context in which professors pursue their craft. Increased complexity means there is more to explore. Our scholarship must embrace rapid scientific innovations in dynamic network theory, and computational modeling. We could put the digital revolution to work for us, by allowing analysts to track the effects of policies within academic institutions and in the societies that nurture them.

NOTES

¹ Pusser, 2002, 121.

² Rhodes, 2001.

³ Bok, 2003.

⁴ Burton and Obel, 1998.

⁵ Johnson, Boster, and Palinkas, 2003.

⁶ Allen, 2003; Rifkin, 1995; Sennett, 1999; Derber, 2000; DiMaggio, 2001. Nonstandard work refers to any faculty appointment that is less than full-time employment. I have adopted this convention solely to make inferences more tractable. No stigma is intended for part-time or temporary faculty.

⁷ Lomi and Larsen, 2001.

⁸ These findings have been updated beyond the preliminary tabulations depicted last year. While previous findings were based on calculations made in 1999, the data and analysis included in this report are based on tabulations made in 2001 (or later) that have been released recently for public use on the National Center for Education Statistics (NCES) website. Any modest discrepancy in either article is the unintended result of the findings released publicly by NCES.

⁹ Twigg, 2002.

¹⁰ Gomory and Shapiro, 2003.

¹¹ National Research Council, 2002.

¹² Pusser, 2002.

¹³ Bailey, 2002.

¹⁴ Armstrong, 2003.

¹⁵ McBay, 2003; Smedley, et al., 2001.

¹⁶ National Research Council, 2002.

¹⁷ Twigg, 2002. The term "marketspace" refers to the virtual world of information, in contrast to the physical world of the marketplace (Twigg, 2002, 78).

¹⁸ Pusser, 2002.

¹⁹ Abu-Lughod, 1999.

²⁰ Smelser, Wilson, and Mitchell, 2001.

²¹ Smith, 2001; Oliver and Shapiro, 2001.

²² Perez, 2001; Smedley, et al., 2001.

²³ This emphasis recently surfaced as my own employing institution completed its accreditation review.

²⁴ Bailey, 2002.

²⁵ Stadtman, 1980.

²⁶ Coleman, 1965.

²⁷ Senge, 1990.

²⁸ Bailey, 2002.

²⁹ The two exceptions are in engineering: Asian-American full-time faculty members (16 percent), and part-time Hispanic faculty members (11 percent).

³⁰ Smedley, et al., 2001.

³¹ Perez, 2001.

³² Missing from these data are sophisticated studies of the dynamic social networks that generate the statistical patterns captured in national sample surveys. See Carley, 2002, 2003 for insights that could be imported to the study of postsecondary institutions and to the agents who produce administrative or public policies.

³³ Bok, 2003, x.

³⁴ Rhodes, 2001.

³⁵ Bloch, 2003.

REFERENCES

- Abu-Lughod, J. *New York, Chicago, Los Angeles*. Minneapolis, Minn.: University of Minnesota Press, 1999.
- Alberts, B. "Looking Back, Looking Forward," *Issues in Science and Technology*, 19 (4) (2003), 5.
- Allen, H.L. "Diversity, Nonstandard Work, and Academic Employment in the 21st Century." In *The NEA 2003 Almanac of Higher Education*, Washington, D.C.: NEA Publishing, 2003, 27-38.
- Armstrong, J.A. "The Foreign Student Dilemma," *Issues in Science and Technology*, 19 (4), (2003), 22-23.
- Bailey, T. "Community Colleges in the 21st Century: Challenges and Opportunities." In *The Knowledge Economy and Postsecondary Education*. Washington, D.C.: National Academies Press, 2002, 59-75.
- Bloch, E. "Securing U.S. Research Strength." In *Issues in Science and Technology*, 19 (4) (2003), 20-22.
- Bok, D. *Universities in the Marketplace: The Commercialization of Higher Education*. Princeton, N.J.: Princeton University Press, 2003.
- Burton, R. and Obel, B. *Strategic Organizational Diagnosis and Design*, 2nd ed. Boston, Mass.: Kluwer, 1998.
- Carley, K., et al. "Destabilizing Dynamic Covert Networks." In *Proceedings of the 8th International Command and Control Research and Technology Symposium*. Washington, D.C.: National Defense War College, 2003.
- _____. "Dynamic Network Analysis." In *Summary of the NRC Workshop on Social Network Modeling and Analysis*. Washington, D.C.: National Research Council, 2002.
- Coleman, J.S. "Diffusion in Incomplete Social Structures." In *Mathematical Explorations in Behavioral Science*, ed. F. Massarik and P. Ratoosh. Homewood, Ill.: Irwin, 1965.
- Dekker, D., Franses, P.H., and Krackhardt, D. "An Equilibrium-Correction Model for Dynamic Network Data," *Journal of Mathematical Sociology*, 27 (2-3), (2003), 193-215.
- Derber, C. *Corporation Nation*. New York: St. Martin's Griffin, 2000.
- DiMaggio, P. (ed.). *The Twenty-first Century Firm*. Princeton, N.J.: Princeton University Press, 2001.
- Gomory, R.E., and Shapiro, H.T. "Globalization: Causes and Effects," *Issues in Science and Technology*, 19 (4) (2003), 18-20.
- Johnson, J.C., Boster, J.S., and Palinkas, L. "Social Roles and the Evolution of Networks in Extreme and Isolated Environments," *Journal of Mathematical Sociology*, 27 (2-3) (2003), 89-121.
- Lomi, A. and Larsen, E.R. (eds.). *Dynamics of Organization*. Cambridge, Mass.: AAAI Press, 2001.
- McBay, S.M. "Still Underserved After All These Years," *Issues in Science and Technology*, 19 (4) (2003), 77-79.
- National Academy of Sciences. "Introduction." In *The Knowledge Economy and Postsecondary Education*. Washington, D.C.: National Academies Press, 2002, 3-10.
- _____. "Challenges Facing a Changing Society." In *Preparing for the 21st Century: Challenges Facing a Changing Society*. Washington, D.C.: National Academies Press, 1997, 1-8.
- _____. "The Education Imperative." In *Preparing for the 21st Century: Challenges Facing a Changing Society*, Washington, D.C.: National Academies Press, 1997, 1-8.
- National Research Council. "Introduction." In *Preparing for the Revolution: Information Technology and the Future of Research*. Washington, D.C.: National Academies Press, 2002, 5-12.
- Oliver, M.L. and Shapiro, T.M. "Wealth and Racial Stratification." In *America Becoming*, Vol. 2. Washington, D.C.: National Academy Press, 2001, 222-251.
- Perez, T. "Current Legal Status of Affirmative Action Programs in Higher Education." In *The Right Thing to Do: Enhancing Diversity in the Health Professions*. Washington, D.C.: National Academies Press, 2001, 91-116.
- Pusser, B. "Higher Education, the Emerging Market, and the Public Good," in *The Knowledge Economy and Postsecondary Education*. Washington, D.C.: National Academies Press, 2002, 106-126.
- Rhodes, F.T. *The Creation of the Future*. Ithaca, N.Y.: Cornell University Press, 2001.
- Rifkin, J. *The End of Work*. New York: Tarcher/Putnam, 1995.
- Schmitt, R.W. "Balancing Support for R&D," *Issues in Science and Technology*, 19 (4) (2003), 24-25.
- Senge, P. *The Fifth Discipline*. New York: Doubleday, 1990.
- Sennett, R. *The Corrosion of Character*. New York: W.W. Norton, 1999.
- Smedley, B., et al. "The Right Thing to Do: Enhancing Diversity in the Health Professions." In *The Right Thing to Do: Enhancing Diversity in the Health Professions*. Washington, D.C.: National Academies Press, 2001, 1-35.
- Smelser, N.J., Wilson, W.J., and Mitchell, F. "Introduction." In *America Becoming*, Vol. 1.

- Washington, D.C.: National Academy Press, 2001, 1-20.
- Smith, J.P. "Race and Ethnicity in the Labor Market: Trends Over the Short and Long Term." In *America Becoming*, Vol. 2. Washington, D.C.: National Academy Press, 2001, 52-97.
- Snijders, T.A.B., and Baerveldt, C. "A Multilevel Network Study of the Effects of Delinquent Behavior on Friendship Evolution," *Journal of Mathematical Sociology*, 27 (2-3) (2003), 123-152.
- Stadtman, V. *Academic Adaptations*. San Francisco, Calif.: Jossey-Bass, 1980.
- Steen, L.A. "Math Education At Risk," *Issues in Science and Technology*, 19 (4) (2003), 79-81.
- Twigg, C. "The Impact of the Changing Economy on Four-Year Institutions of Higher Education: The Importance of the Internet." In *The Knowledge Economy and Postsecondary Education*. Washington, D.C.: National Academies Press, 2002, 77-103.
- Yankelovich, D. "Winning Greater Influence for Science," *Issues in Science and Technology*, 19 (4) (2003), 7-11.
- Wulf, W.A., and Duderstadt, J. "Information Technology and the University," *Issues in Science and Technology*, 19 (4) (2003), 82-84.