

Jobs on the Move: Implications for U.S. Higher Education

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The culture within which we educate needs more people with higher education in science, technology, engineering, and math, and a ubiquitous acceptance of lifelong learning.

Introduction

Powerful economic forces will profoundly reshape U.S. higher education in the years ahead (Council on Competitiveness 2004; Engardio 2006; Friedman 2005; Hira and Hira 2005; Prestowitz 2005). The accelerated offshore movement of white-collar jobs to India, China, the Philippines, Russia, and other countries can potentially affect the future job prospects of college graduates and threaten the long-term innovation capacity of universities and thus the nation (Engardio 2005, 2006; Engardio et al. 2005).

We examine in this article these global economic dynamics and assess the challenges they pose for U.S. higher education. Consistent with the views of many others, we contend that higher education can and must play a critical role in preparing our increasingly diverse and highly mobile society for the speed-driven and knowledge-intensive global economy, thereby maintaining U.S. competitive advantage (Johnson 2006). This will require that our colleges and universities become nimbler, more entrepreneurial agents for change with as much outward as inward focus (Stanton 2007). We conclude with suggested strategies for U.S. higher education to meet 21st-century economic realities.

Recent Economic and Job Shifts

Paralleling rather dramatic demographic shifts (Johnson 2006), our nation is in the midst of a major economic transformation, which is anchored in two waves of globalization. As figure 1 shows, the first wave involved the offshore movement of blue-collar jobs. This shift began

in earnest in the early 1980s and continues to this day. Nationally, 5.3 million manufacturing jobs have been lost since 1979. Roughly half of this manufacturing job loss occurred between July 2000 and July 2003 (Press Associates Union News Service 2003).

The recommendation that older displaced blue-collar workers return to school and retool for white-collar service jobs in the new economy, if it were ever realistically feasible, may be even less realistic in the future (Almeida 2003). This is because the second wave of globalization involves the growing offshore movement of white-collar jobs, as shown in figure 1 (Birnbaum 2003). This wave started in the early 1990s with U.S.-based corporations outsourcing work related to the maintenance and upgrading of their computer programs to offshore vendors (Amoribieta et al. 2001). During the

late 1990s, the trend accelerated as U.S. firms contracted with offshore vendors to address their Y2K programming needs (Chapman 2003).

More recently, U.S. corporations have engaged offshore vendors in what is known as business process outsourcing, which involves a range of business functions, including supply-chain management, operations, sales, marketing, and customer care (Rosenthal 2003). Similarly, some state governments have contracted with offshore vendors for millions of dollars' worth of various services—including call centers for food stamp programs, the handling of health insurance claims, and even parking ticket processing (Kahaner 2004). In 2004, 42 states and the District of Columbia operated Electronic Benefits Transfer (EBT) call centers offshore (Mattera et al. 2004).

Substantial evidence suggests that the trend toward offshore outsourcing is moving up the value chain within U.S. firms to higher-order, knowledge-intensive functions—what is now known as knowledge process outsourcing, as shown in figure 1 (Simon 2005). At present, this development is most evident in the financial services industry.

Financial institutions, including banks, mutual funds, insurance companies, investment firms, and credit card companies reportedly are sending work overseas at heightened speed. The work going offshore is not limited to information technology services. It also includes other business activities like insurance claims and mortgage application analysis, equity research, and sophisticated accounting (Gupta 2003).

Commenting on the role of this job shift in the financial services industry, one study concluded that offshoring has created a truly global operating model for financial services, unleashing a new and potent dynamic that is changing the rules of the game for the entire industry (Gentle 2004). Another study estimated that “potentially 2.3 million American jobs in the banking and securities industries could be lost to outsourcing abroad” (Rai 2004, unpaginated Web source). Further, it has been forecast that “the 100 largest global financial institutions will move \$400 billion of their work offshore for \$150 billion in annual savings” by 2010 (Rai 2004, unpaginated Web source).

The technological innovations facilitating this white-collar jobs shift have given U.S. corporations “hyper-flexibility” in terms of where to locate various business functions. Research indicates that U.S. firms have used their locational hyper-flexibility to pursue a three-pronged global business services delivery strategy known as right sourcing (Costanzo 2003).

As figure 1 shows, onshore outsourcing is one component of this right-sourcing strategy. In an effort to remain internationally competitive, multinational firms increasingly have used two temporary guest worker programs, the H-1B visa¹ and the L-1 visa,² to recruit professional level

foreign employees with expertise in specialty occupations (H-1B visa), with executive and managerial skills (L-1A visa), and with “specialized knowledge” (L-1B visa) to their U.S.-based operations. Frequently, U.S. companies work through foreign firms to recruit these temporary workers.

Highly trained in the areas of engineering, programming, and other computer-related jobs in manufacturing, financial services, consulting, health care, and biotechnology, these temporary or guest workers are allowed to stay in the United States for five (L-1B workers with “specialized skills”), six (H-1 B visa holders), or seven (L-1A executives and managers) years. During their tenure, they acquire in-depth knowledge and experience in a range of core business functions—skills that are transferable to other locations, often their home countries.

Commenting on what happens when guest workers’ visas expire, Almeida (2003, unpaginated Web source) asserts that

The surge of [offshore] outsourcing can be traced to the explosion in the last five years of H1-B and L-1 visas which saw in excess of over [a] million foreign guest workers enter the U.S. As they developed their core competencies in high tech and other fields they have returned home and taken these and future white collar and other jobs with them.

Near-shore outsourcing is the second component of the right-sourcing strategy currently being pursued by American corporations (figure 1). In this instance, firms shift white-collar service sector jobs to nearby locations, such as Mexico, Jamaica, Barbados, the Dominican Republic, and especially Canada and Ireland, where there is a highly motivated, skilled labor force and the cost of doing business is cheaper than in the United States (McCracken 2002). Research indicates that firms have shifted mostly low-level service work to these destinations (Waldman 2003), although more recently these areas have become destinations for higher-order work in engineering and other technical fields (Smith 2006).

Far-shore outsourcing is the third and most recent component of the right-sourcing strategy (figure 1). In this instance, and in contrast to near-shore outsourcing destinations, emerging market countries that are geographically distant from the United States are targeted as potential destinations for a range of white-collar jobs, including higher-order business functions. Among other forces, the drive to reduce labor cost in the post-9/11 U.S. economy and the need to spread the risk in case of another terrorist attack influenced corporate decision makers to consider offshore outsourcing destinations in such faraway places as Asia, Central and Eastern Europe, Africa, the Middle East, and South America (IDGNS 2005). Other major drivers of this shift are the quality of the workforce in these countries, particularly in information

technology; the desire to leverage time zone differences to provide customer service on a round-the-clock basis; and the possibility of accelerating research and development activities by taking advantage of the ability to be always working someplace in the world where the sun is rising (Moore 2002).

The specific mix of onshore, near-shore, and far-shore activity varies from company to company. According to Kirkpatrick (2002, unpaginated Web source), some big companies are putting “40% of [the] work in India, and 30% in a safe but cheaper place like Canada, with the remainder staying in the U.S.” Quan (2002, unpaginated Web source) notes that “[a] typical offshore software project might employ 100 people, with 10 to 20 in the U.S. to perform direct customer support and 80 to 90 offshore to do behind-the-scenes development so that a company can make a higher profit.” Some of the U.S. workers may be H-1B visa holders, another part of the network may be near shore, and offshore workers may be in multiple locations in one or more of the centers of this type of activity. For some firms, this right-sourcing model or portfolio approach constitutes a strategy to ensure business continuity in the event of a catastrophe (Greenemeier 2002).

No one knows for sure how many U.S.-based white-collar jobs are likely to move offshore (U.S. Government Accountability Office 2004). The U.S. Bureau of Labor Statistics is just now beginning to systematically gather data to monitor this trend (Department for Professional Employees, AFL-CIO 2004). However, one reputable study estimates that about 14 million U.S. jobs—roughly 11 percent of the U.S. employment base—are concentrated in occupations vulnerable to offshore outsourcing (Bardhan and Kroll 2003).

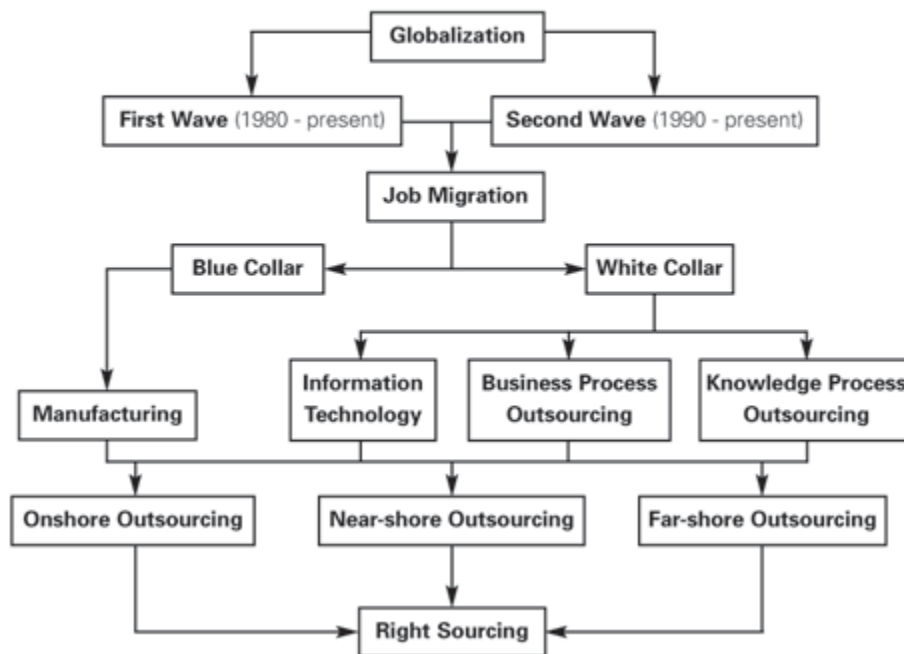
The shift of white-collar jobs offshore is part of a larger revolution in which the U.S. economy becomes the final assembler or utilizer of what might be called the global supply chain of services. In this respect, the information-processing sector is undergoing a transformation similar to that experienced by the goods-processing sector, with increasingly more sophisticated manufacturing and component sourcing activities moving offshore.

Karmarkar (2004, p. 101) argues that the Internet and other modern communications technologies have essentially created an “information assembly line, [which allows] information today [to] be standardized, built to order, assembled from components, picked, packed, stored, and shipped, all using processes resembling [a manufacturing global supply chain].” He goes on to argue that “[n]ew hardware and software systems that take care of back-room and front-office tasks such as counter operations, security, billing, and order taking are allowing firms to dispense with clerical, accounting, and other staff positions (Karmarkar 2004, p. 101).

The way Wal-Mart has leveraged information technology to monitor retail sales, inventory reduction, and worker productivity as well as to interface

with suppliers to ensure just-in-time delivery of products is one of the best examples of how companies are embracing the information assembly concept for competitive advantage in the global marketplace (Friedman 2005).

Figure 1 Globalization's Effect on the American Worker



Karmarkar (2004) suggests further that the growing online booking of flights, hotel reservations, car rentals, and other services is ushering in a self-service revolution, where increasing numbers of standardized information processing jobs will disappear entirely. While the jury is still out on the ultimate net affect of the offshore outsourcing and information processing revolution on America's white-collar job future, it seems likely that many of those with college degrees and beyond will face increasing risk.

Higher Education Challenges

The employment shifts we have described portend important challenges for America's colleges and universities as they seek to better prepare their graduates and themselves to prosper in the decades ahead. Here we focus on two of the most salient challenges. The first is the need to respond to the demands for more traditional college-age graduates in the STEM fields (science, technology, engineering, and math) and for lifelong education for displaced workers, aging baby boomers, and other targeted populations (e.g., military veterans and their families). The second is the need to develop

new strategies for maintaining and enhancing the innovation capacity of higher education institutions.

Colleges and universities must address the shortage of graduates in the STEM fields and invest greater resources in lifelong education. In the years ahead, higher education institutions will have to produce more graduates in the STEM fields and other disciplines that are relevant to the global economy and the dynamic needs of business. In the United States today, only about 16 percent of undergraduate degrees are awarded in the STEM fields, while in China more than 50 percent of undergraduate degrees are in these fields (Kuenzi, Matthews, and Mangan 2006). We must produce more graduates in the STEM fields because these disciplines are the training grounds and scientific incubators for new advances that lend themselves to technology commercialization and job creation (Ante 2004; Engardio et al. 2004).

In addition, as the rate of technological change and the pace of globalization continue to accelerate, greater demand will be placed on colleges and universities to accommodate a growing number of adults who will need to retool and upgrade their skills to compete for new jobs in a rapidly changing economy (Council on Competitiveness 2004; Coy et al. 2004). One can see signs of the likely increase in the demand for lifelong education services in recent long-term unemployment statistics.

Data compiled by the Economic Policy Institute reveal that the largest percentage increase in long-term unemployment (six months or more) between 2000 and 2003 occurred among people with some college education (259 percent) and with a bachelor's degree or higher (299 percent). The percentage increase for these groups was much greater than for people with a high school degree or less (156 percent) (Allegretto and Stettner 2004). It seems plausible to suggest that these statistics are—at least in part—influenced by both the offshoring of information processing jobs and the computerization of others.

The adult population (age 25 and older) will drive the demand for lifelong education in the future (Miller 2001). Pivotal here will be the huge cohort of boomers who are now aging into their 50s and 60s (Johnson 2006) and who have been out of college for 30 years or more and are in search of intellectual as well as skill revitalization. A substantial portion of these individuals are sufficiently well-off to retire early. (In fact, the retirement age for college graduates is declining.) This group (which holds over half of the disposal income in the country) constitutes a major demographic market now being targeted by the business world. Were they to become reengaged in higher education, their input could also be extremely valuable in terms of the discussion, debate, and real-world experience they could bring to the classroom.

Regarding the latter, both traditional-age students (age 18 to 24) and somewhat older graduate students could benefit measurably from the work life, travel, and historic experiences of these older students (e.g., participation in the advent of the civil rights movement). Innovative mechanisms to weave these older students into the educational fabric of colleges and universities may thus result in powerful mutual benefits.

U.S. higher education institutions—and the nation in general—must develop new strategies for maintaining and enhancing their innovation capacity in the future. The recent trend toward the outsourcing of research and development in corporate America constitutes a significant threat to the innovation capacity of U.S. graduate universities (Carey 2004; Engardio 2006; Engardio et al. 2004). Most economists downplay concerns about the offshoring of white-collar jobs (Mann 2003), contending that, as in the past, the United States will likely develop continuing waves of innovations that will create even more and better paying jobs than those going offshore.

Historically, the United States has demonstrated a high level of resilience in response to globalization and structural changes in the economy. As well, scientific discoveries originating in university research laboratories have contributed significantly to the nation's competitiveness in the global marketplace (Mehta 2004). But, we believe that several recent developments challenge the innovation capacity of U.S. universities and the nation in general—and thus our ability to create the next wave of good jobs in the decades ahead (Kao 2007).

First, the global competitive landscape is changing (Carey 2004; Council on Competitiveness 2004). Consider the developing nations that are embracing capitalism and free trade—China, India, and the former Soviet Union among others (Joseph 2002; Koehler et al. 2004). Collectively, these nations have a population that is 10 times that of the United States, and they produce annually far more well-trained college graduates than does the United States (Gruber 2004). Moreover, a large portion of their college graduates can perform essentially the same work as educated American workers for about a fifth to a tenth of the cost (Engardio et al. 2003). These countries are also investing in new technological infrastructure and are creating the business and regulatory environment needed to foster innovation and technology commercialization that has been previously lacking (Gupta 2003; Kripalani 2005).

Second, immigrants to the United States have constituted much of the talent pool that has driven innovation in our economy. In 2003, for example, immigrants accounted for 47 percent of the applications for U.S. patents, up from 17 percent of all applicants in 1965 (U.S. Patent and Trademark Office 2007). Immigrants, in fact, led many of the high-technology start-up companies that fueled the economic boom of the 1990s (Saxenian 2000). In

addition, at both the undergraduate and graduate levels of U.S. higher education, international students and children of immigrants are responsible for nearly all of the enrollment growth in the physical sciences, math, and engineering programs (Ante 2004; Engardio et al. 2004).

But security restrictions imposed after the 9/11 terrorist attacks constrain the flow of foreign talent into the United States and thereby threaten our human resource capacity to develop the next generation of innovators and innovations (Ante 2004; Council on Competitiveness 2004). Statistics compiled by the Institute of International Education (2004) reveal that the foreign-born population of students in U.S. colleges and universities declined by 2.4 percent in 2004—the first such decline since 1971. In addition, the backlog of applications for work permits, permanent residency, and citizenship has increased sharply since 9/11. As well, under the current security environment, many of the immigrants who were engaged in the development of innovations that drove the 1990s boom are returning home to set up businesses that will directly compete with U.S. technology-based firms (Florida 2004, 2005; Goswami 2004).

Third, many U.S.-based firms are shifting a significant proportion of their research and development (R&D) activities offshore. In 2000, General Electric Company was among the first companies to establish a major offshore R&D facility, the John F. Welch Technology Centre in Bangalore, India (Rose 2002). This facility hosts more than 3,800 scientists, engineers, and researchers—two-thirds of whom have advanced degrees (General Electric Company 2008a). Charged with developing breakthrough technologies that translate into growth of GE businesses, the center reportedly has “filed for more than 185 patents for research and development activities...and been granted 12 to date” (General Electric Company 2008b, unpaginated Web source).

A large number of multinational firms, including Microsoft Corporation, Dell, Bank of America, Amazon.com, The Coca Cola Company, Eli Lilly and Company, and Charles Schwab and Company, have followed GE’s lead in shifting R&D activities to offshore locations (Arndt 2006; Engardio et al. 2005; Helm 2004). Much of the work in drug discovery, for example, reportedly is shifting to Hyderabad, India, nicknamed Genome Valley (Iype 2004).

Commenting on how the offshore movement of R&D activities threatens the innovation capacity of America., U.S. senator Joe Lieberman stated that

The innovation structure that served us well in the face of less formidable competition is no longer sufficient in the face of this new fierce global competition. Key components of our innovation infrastructure are deteriorating as federal funding of R&D, the number of science and

technology graduates, and business investments in the U.S. continue to decline. (Koehler et al. 2004, p. 5)

Such trends could well mean that fewer R&D dollars will flow into research universities from the private sector in the years ahead, either through collaborative campus partnerships or as a result of geographic propinquity. It may not be realistic to assume that the federal government will fill the void. Federal research and development funding as a percentage of gross domestic product has remained flat for the past 15 years (Jaffe 1996; Shackleford 2005).

Responding to the Challenges

We now focus on strategies that U.S. higher education institutions must pursue to remain competitive in the research and development marketplace and to ensure that both future college graduates and lifelong learners can succeed in the global economic and knowledge race of the 21st century.

American universities will face stiff competition from offshore vendors for corporate research and development dollars in the years ahead. Offshore vendors have a comparative advantage because the human capital pool of talented scientists and engineers is larger and the cost of doing business is cheaper in emerging market countries. Offshore vendors also have the ability to be more agile and flexible than American universities in responding to the research and development needs of major corporations. By shifting research and development work offshore, American corporations are able to leverage the power of the sun to speed up the research and development process without the attendant higher overhead costs and multiple levels of bureaucracy involved in doing business with American universities.

Three major structural changes are required if American universities are to remain competitive in the corporate research and development marketplace. First, higher education institutions must move away from their inward-focused ivory tower orientation and become more outward-focused, outward-oriented entrepreneurial engines for new business development and job creation.³ This will require a reengineering of the faculty reward structure to embrace both high-impact applied or action-oriented research and traditional basic research (Stanton 2007; Tornatzky, Waugaman, and Gray 2002).

Second, in striving to become entrepreneurially driven engines of economic growth and job creation, universities must move rapidly to install mechanisms that (1) encourage and create incentives for more interdisciplinary and cross-disciplinary research on their campuses, and (2) facilitate and support the establishment of regional, national, and global research networks designed to address pressing basic and applied research questions (Safford 2004; Tornatzky, Waugaman, and Gray 2002). These

steps are necessary because the next wave of leading-edge innovations is unlikely to emanate from basic research conducted in the silos of university disciplines. Rather, the major advances of the future are more likely to emerge from interdisciplinary and cross-disciplinary research within universities—inquiries at the intersections of disciplines—and through interuniversity/ private sector knowledge networks of scholars and researchers that span international boundaries (Chesbrough 2001; Studt 2007).⁴

Third, to succeed in this new role, universities must figure out how to become more cost-competitive and how to operate at the speed of business. Streamlining the bureaucracy that currently characterizes the university contracting and technology commercialization processes will go a long way toward addressing these issues.

These requisite structural changes should enhance the ability of U.S. colleges and universities to produce more STEM graduates. However, higher education institutions must also become more actively engaged in K-12 education to ensure that there is pipeline of students entering U.S. universities who are not only interested in pursuing degrees in the STEM fields but also are prepared for the rigors of college-level coursework. This engagement must take the form of preparing more public school teachers in the STEM fields, working with public school systems to reform and realign the K-12 curriculum with 21st-century global realities, and educating public school students about college readiness (Johnson 2007).

Because change is likely to be the only constant in the future, students who elect to major in the STEM fields—indeed in all fields—will need to graduate with more than just the “hard skills” in their chosen discipline. They will need two additional types of skills in their tool kit (Klaus 2008; Phani 2007a, 2007b; Schramm 2006):

- Soft skills—those intangible attributes, abilities, skills, and traits that pertain to personality, attitude, and behavior rather than to formal or technical knowledge (Moss and Tilly 1996). These skills include the ability to think critically, reason analytically, solve problems, communicate clearly both orally and in writing, and work in teams that increasingly will span the globe.
- Entrepreneurial acumen—a demonstrated willingness to take higher risks for higher rewards and the ability to be agile, resilient, tenacious, and decisive in responding to unanticipated crises and opportunities. Such an orientation enables one to become more resourceful and innovative in creating “outside-of-the-box” solutions to pressing problems, both domestically and internationally (Schramm 2006).

These attributes—which colleges and universities must nurture—are essential to prosper in the increasingly turbulent and unpredictable economy of the 21st century (Kao 2007).

To properly equip the traditional college-age population with these skills, the higher education curriculum must be restructured. Currently, inadequate resources are being invested in soft skills training, which both private and public sector employers say must be core to the education that every college graduate receives, especially those majoring in the STEM disciplines (Engardio 2007). Many of the millions of dollars that colleges and universities have invested have been spent on remedial work to overcome the deficits in students' backgrounds and training that prevent them from succeeding in college, particularly in the area of writing ability.⁵ Because many graduates have not been adequately trained, corporations reportedly are spending \$3.1 billion annually to rectify college-educated employees' writing deficiencies (The National Commission on Writing 2004), and state governments reportedly are spending a half-billion dollars annually for the same purpose (The National Commission on Writing 2005). An untold amount is spent to equip employees with the other soft skills required in the knowledge economy of the 21st century.

In revising the curriculum to prepare 21st-century students for 21st-century realities, higher education also must develop an appreciation of and demonstrate a major commitment to what the University of Texas at Austin communication studies professor Richard Cherwitz defines as "intellectual entrepreneurship." This involves creating synergistic relations among academic disciplines and between intellectuals on and off campus: to make seamless connections among disciplines and between the academy and the public and private sectors. Intellectual entrepreneurship is about harnessing, integrating, and productively utilizing intellectual energy and talent wherever it is located—in order to promote academic, cultural, political, social, and economic change. (The University of Texas at Austin 2004, unpaginated Web source)

By developing and fostering intellectual entrepreneurship, administrators, faculty, and students will not only gain a greater understanding of the forces that shape the world but also become one of the new agents of change.

Such a focus is likely to be highly attractive to the traditional college-age population in the future. As research has shown (Johnson 2006), many of these students will come from economically disadvantaged backgrounds and/or communities. Cherwitz (2005, p. 32) argues—correctly in our view—that training in intellectual entrepreneurship will "empower [these] students...to discover otherwise unobserved connections between academe and personal and professional commitments." This training will also facilitate students' abilities to solve problems and effect change in their own

communities and beyond. In short, this shift toward intellectual entrepreneurship will enable colleges and universities to create the next and succeeding generations of both traditional entrepreneurs in business venturing and a cadre of social and civic entrepreneurs who are committed to using their talents to make meaningful change in the nonprofit and government sectors (Bornstein 2004).

Two good examples exist of the types of curricular changes that colleges and universities throughout the United States must make to prepare students to compete in the years ahead. The first is the previously referenced intellectual entrepreneurship program at the University of Texas at Austin. The second is a major Kauffman Foundation- funded cross-campus initiative that is designed to infuse an entrepreneurial culture throughout the campuses of eight U.S. universities through programs that (1) inspire students to become more entrepreneurial, (2) teach them how to be more entrepreneurial, (3) connect them with business and social entrepreneurs to learn directly and gain experience, and (4) create new attitudes, new knowledge, and new business and social ventures.⁶

American colleges and universities must also pursue a variety of strategies and delivery mechanisms to address the education needs of lifelong learners. These include online and distance education programs, evening and weekend classes and programs, and other flexible options such as courses of varying length that meet the needs of displaced workers, working adults, retirees, and other targeted groups such as military veterans. Higher education institutions may also have to consider establishing satellite campuses and higher education centers, especially in high-need underserved areas.

Concluding Thoughts

The most successful and competitive U.S. colleges and universities, like the consummate entrepreneur, have demonstrated time and again the ability to turn adversity into opportunity in dealing with internal challenges as well as external threats. These universities—indeed all higher education institutions—must respond to the current economic challenges in much the same way: by becoming more strategic, agile, and flexible in the delivery of education and research services and by developing, nurturing, and most importantly unleashing the full entrepreneurial potential that exists on their campuses. Responding in this way, we believe, will pay great dividends in years ahead. Foremost among the payoffs will be the assurance that future graduates are able to compete successfully for employment and business opportunities in the knowledge economy of the 21st century.

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Notes

1. The H-1B visa program allows U.S. firms to recruit skilled labor in occupations in which there is an inadequate supply of trained native-born workers. Congress sets a ceiling on the number of H-1B visas granted annually, stipulates that H-1B visas holders must be paid prevailing wages, and requires verification that the guest worker is not harming conditions for U.S. workers (Nachtigal 2002). During the economic boom of the late 1990s, Congress continuously increased the annual ceiling on the number of H-1B visas, from 65,000 to 195,000. But post-9/11 security measures and the economic slowdown that followed the terrorist attacks forced Congress to reduce the number of H-1B visas granted annually back to the pre-9/11 level. As it has become more difficult to recruit labor through the H-1B program (Rosenthal 2001), firms have used the lesser-known L-1 visa program to bring in skilled foreign workers or have accelerated their move toward near-shore and especially offshore outsourcing (Vaas 2002).

2. The L-1 visa program allows multinational corporations to transfer employees from their foreign branches, subsidiaries, or affiliates to the United States. In contrast to the H-1B visa program, there is no ceiling on the number of employees who can be transferred and no requirement to pay prevailing wages. The numbers of L-1 visa workers have increased sharply post-9/11. Research indicates that Indian-based software giants are the largest users of the L-1 visa program.

3. Some believe that the mission of the university should be broadened beyond teaching and research to include an emphasis on invention. Kunhardt (2004, unpaginated Web source) argues that "putting an emphasis on invention would enrich the academic community by adding a new dimension of creative expression."

4. To facilitate this kind of cutting-edge work, some universities are developing research campuses, like the proposed Carolina North at the University of North Carolina at Chapel Hill (carolinanorth.unc.edu) and Centennial Campus research park at North Carolina State University in Raleigh, North Carolina (centennial.ncsu.edu). On such campuses, major corporations and university researchers (including their graduate students) share physical space and collaborate on research and development activities in a host of basic and applied research domains.

5. American universities reportedly spend up to \$1 billion annually shoring up the writing weakness of incoming college students (The National Commission on Writing 2003).

6. The schools awarded grants in the first round of the Kauffman Campus Initiative include Florida International University, University of North Carolina at Chapel Hill, University of Illinois at Urbana-Champaign, The University of Texas at El Paso, Howard University, University of Rochester, Wake Forest University, and Washington University in St. Louis.