Training in the Dilbert Economy

By Anthony P. Carnevale and Donna Desrochers

What high tech?
More of us work in offices, and what that means for the future.

In the late 1970s, there was dread in the air. American workers were being displaced as technology breakthroughs enabled manufacturers to work faster, more efficiently, and more cheaply than ever beforeæ with fewer workers. Some manufacturers relocated overseas to lower production costs. In the United States, job opportunities shifted from traditional manufacturing such as steel and textiles to the services sector—a sector long associated with low productivity, low wages, and low skills.

The United States was headed into an economic tailspin, economists warned, fast becoming a nation of "hamburger flippers"æ poorly educated workers with few chances for advancement. Services jobs just weren't productive enough to command higher wages or higher skills.

Or were they?

You could call what actually happened "the American surprise"æ the fact that the U.S. economy is now the envy of the world and that its fastest growth is occurring in the high-paying, high-skilled services sector, not in the low-wage services sector. And, no, not even in the high-technology sector, which, though growing, remains a relatively small niche of the job market.

It's about induhviduals

The new economy is more than a simple choice between cheeseburgers and microchips. It does not belong to Ronald McDonald or Bill Gates. The new economy belongs to the comic strip character, Dilbert, who works in an office, as do most American workers.

Did that surprise you? If you read the papers and watch TV, you get the idea that all jobs are in the high-tech industry. But high-tech is the sizzle; the beef is in the office. Don't get us wrong: Technology is a key element in transforming the U.S. economy, but principally because more nontechnical workers are using technology. It's not because there's a need for a lot more technical workers to make or repair technology.

The shortage of high-tech information workers is real, mainly because labor markets are tight in every occupation and because the composition, not overall size, of the technical workforce is shifting from the old makeup of millwrights, industrial welders, pipe fitters, and others to the new demand for IT workers and health-care technicians.

The unexpected source of U.S. job growth is in white-collar services in the private sector. A generation ago, Dilbert would have worked in a factory; now, he works in an office. While the share of technical positions among all U.S. jobs has increased by 3.2 percent since 1959, the share of white-collar services jobs in education and health care has increased by 4.8 percent in the same period. But the greatest growth in white-collar services is in office jobs, having grown by an astonishing 36 million since 1959. Marketers, lawyers, editors, accountants, salespeople, and others now account for 53 million, or 41 percent, of the American economy's 133 million jobs.

Didn't we just downsize middle managers? So why has the number of office jobs skyrocketed? No one knows for sure, but there are some plausible explanations. Perhaps the value added from human capital in making products and delivering services has declined as those hands-on activities have been automated and "routinized." Perhaps there's greater value added from management, marketing, financial transactions, and other service functions in the increasingly complex production and service networks typical of the new economy. Or perhaps the shift from mass production of standardized goods has required a new cadre of office workers and other services workers to deliver on new performance standards set by consumers who are more informed, courtesy of the Internet.

Whatever else they do, those new office workers are rationalizing, reengineering, reinventing, revitalizing, and restructuring the rest of us. They are challenging the traditional prerogatives of crafts workers, professionals, and even customers as they move beyond the private business sector into privatized government, corporate health care, and corporate universities.

Myths and realities

The U.S. economy has, somewhat surprisingly, transformed itself into a high-skilled, high-wage services economy that is expected to keep growing. People in such jobs earn more moneyæ 50 percent of total U.S. earningsæ than in any other part of the economy. In 1995, for instance, office workers earned 47 percent more than nonoffice workers.

Those figures have shattered the myth of the United States as a nation of hamburger flippers. Today, low-wage service jobs account for about 21 percent of all U.S. jobsæ the same percentage as in 1959, when Dwight D. Eisenhower was president. Moreover, 30 percent of low-wage workers are under 21 years old and are likely to hold such positions temporarily as they finish their education or land better jobs.

The facts show that all of the better jobs in the U.S. economy are *not* in the high-technology sector. Though positions with such companies as Microsoft, Intel, and Dell are good jobs, there are few of them—having risen only from 3.4 to 6.6 percent of all U.S. jobs since 1959. The reason? It doesn't take that many workers to make or repair technology.

How can that be, you may ask, when every governor in America has his or her state's CEOs beating the drum for "new technology jobs" and technology training? As in other economic sectors, when you take a careful look at what workers in technology firms actually do, it turns out that fewer than you might think need or use technical skills.

Consider Intel Corporation, the world's primary silicon-chip producer, with $30 billion in annual sales and more than 60,000 employees. However, only about one in four Intel employees requires advanced technical training. What do Intel workers do? One in three performs an office function such as management, administrative work, or sales to organize and move Intel's products from factory to market; 45 percent of Intel employees are machine operators and packers.

General skills and education

As the occupational structure of the U.S. economy has shifted, so have its skill requirements. The demand for specific vocational skills is giving way to a growing need for general cognitive skills—mathematical and verbal reasoning ability as well as a new set of general behavioral skills.

As flexible technology takes on more tasks, workers in all jobs—including technical and professional—spend more time interacting with co-workers and customers as well as performing technology-deployment functions that require general skills. In addition, the increasing level of human interaction in manufacturing and the expansion of white-collar services occupations demand that workers have people skillsæ the abilities to work as a team or to interact with customers, students, patients, and so forth.

General skills have become more important because—unlike in the old manufacturing-based economy in which productivity (high volume at low cost) was paramount—the new service-oriented manufacturing economy and growing services economy demand a more complex set of performance standards. They include quality, variety, customization, customer focus, speed of innovation, and the ability to add novelty and entertainment value to products and services.

Employers that meet quality standards require conscientious workers who are able to take responsibility for the final product or service—regardless of their level in the company. Variety and customization require workers who are creative and good at problem solving. The focus on customers requires empathy and effective communication and interpersonal skills. Continuous innovation requires a general ability to learn. Adding novelty and entertainment value requires creativity.

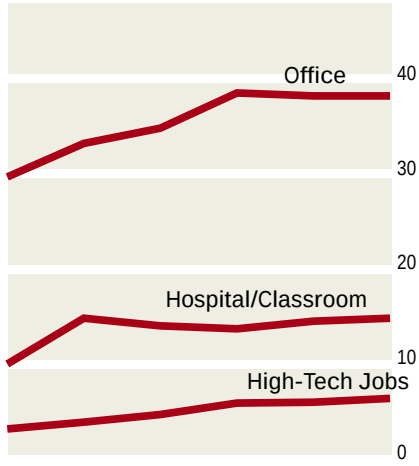
Moreover, as service functions grow in every job and as the share of services occupations grows, the unavoidable increase in the level of human interaction at work requires that people value diversity among their co-workers and customers. Properly handled, diversity discourages "group think" and creates alternatives for every business decision. When diversity isn't valued, there's conflict, which is counterproductive.

Little is known about how to develop and assess general cognitive and behavioral skills in students and workers, but most employers associate such skills with educational attainment, especially college level. Consequently, many American employers use a college degree as the stan-

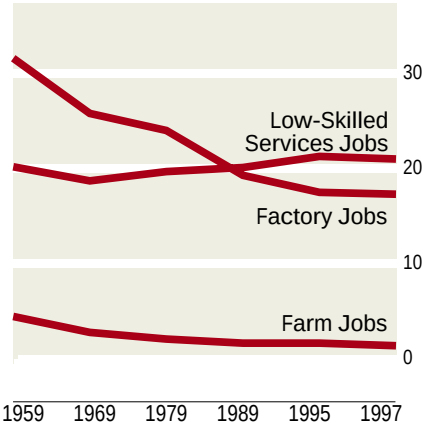
More Education, Higher Pay
1959–1997

Percent of total employment

More than two-thirds of workers in growing, good-paying occupations have postsecondary education:



Only one-third of workers in these declining or low-paying occupations have postsecondary education:



ETS analysis of 1960 Census and Current Population Survey (March 1970–March 1998)

dard by which to screen job applicants.

U.S. workers are highly educated: Seventy-four percent of education and health-care workers and 66 percent of office workers have completed at least some college. In fact, nearly six out of 10 prime-age U.S. workers have some college education, compared with two out of 10 in 1959. About 28 percent of that increase in college-level skills comes from growth in occupations that have traditionally required college credentials. But a much larger share—72 percent—comes from growth in occupations that traditionally have *not*.

Not everything about the new economic landscape is rosy. Only about 20 percent of U.S. workers are landing jobs with employers that offer job security, training, and opportunities at lifelong learningæ the keys to success in the office economy. Some 40 percent of American workers aren't receiving education after high school and thus will never make it onto the payrolls of America's better employers, especially those elite that provide training and career development. In between, are the rest of us who will continue to receive uneven training and advancement opportunities.

Without changes in policy and market incentives that encourage an equal opportunity to learn in school and on the job, uneven access to education and training will continue to drive a wedge between the learning haves and the learning have-nots. Eventually, a shortage of qualified workers could result and put continued competitiveness of the U.S. economy at risk. Policymakers need to do their part to adopt programs that reward better employer training. Meanwhile, trainers and managers need to adopt programs that bridge the gap between on-the-job learning and schooling.

Learning Haves and Have-Nots

	While working with current employer, percent that received...		Hours of training per employee*	
	Formal training	**Informal training**	**Formal training**	**Informal training**
Computer skills	38.4	54.3	5.1	6.8
Professional and technical	30.9	27.7	1.9	4.3
Management	28.4	32.3	.6	1.1
Sales and customer relations	26.6	30.9	.6	2.6
Production-related	21.0	34.1	2.0	8.6
Clerical and administrative support	18.7	30.1	.6	2.8
Service-related	12.5	14.7	.3	1.8

* Hours per employee for the period May-October, 1995

Source: Bureau of Labor Statistics. 1996. "BLS Reports on the Amount of Formal and Informal Training Received by Employees." Press Release USDL 96-515, December

Take the high road

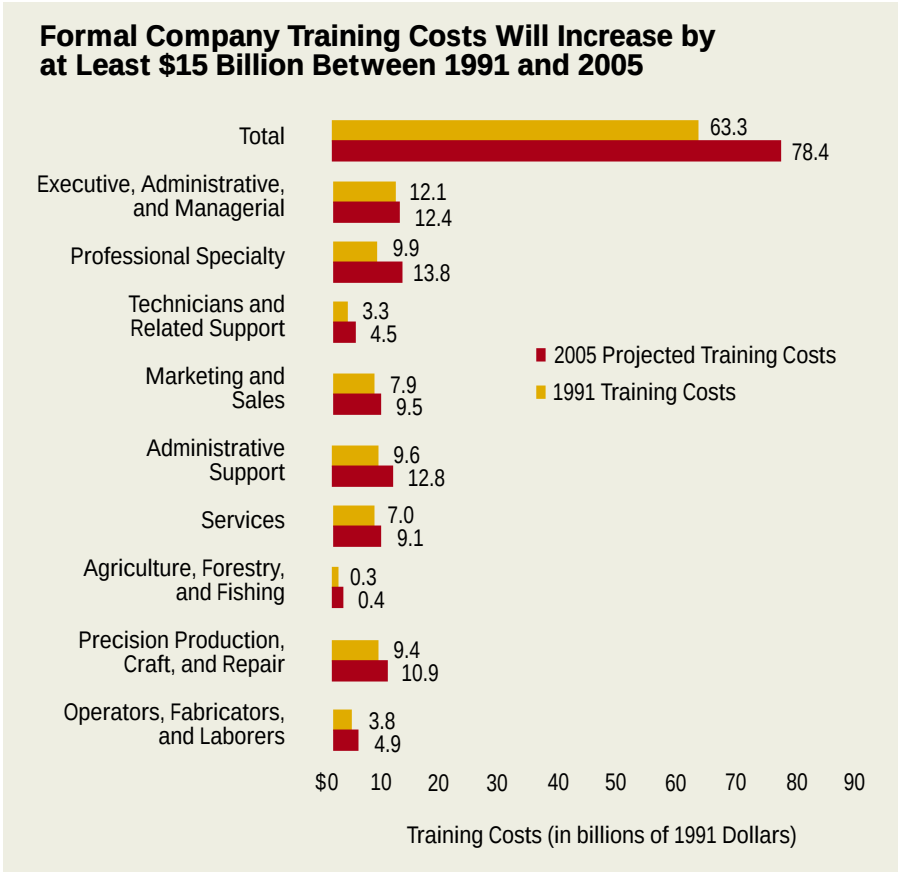
Even though U.S. employers increasingly demand more skilled workers, not all are taking the high road: investing in their workforces to develop the needed skills. Many employers are still on the low road—the historic path of mass production—by downsizing, outsourcing, and de-skilling to improve productivity by slashing labor costs. Though those strategies result in short-term gains, they reduce long-term economic competitiveness, living standards, and income equality.

Only a few U.S. employers are traveling the high road. About one-half are investing in their employees by offering training to keep them highly skilled and able to react quickly to changing technology and market requirements. Those firms are also more likely to offer pay-for-knowledge systems and employee-assistance and wellness plansæ programs that show a commitment to employees' morale and well-being. But only 37 percent of large employers implement high-performance work measures such as quality circles, teams, and total quality management to increase productivity. Those high-road companies, some of the economy's most competitive, recognize that it's no longer enough for a business to compete solely on the basis of price for standardized goods and services.

To meet new competitive requirements at the least cost, high-road employers are turning to information technologiesæ the computer in its various incarnations. New technology helps increase efficiency and quality standards more than labor-intensive methods, enables more consistent quality control, encourages continuous innovation, customizes with a few keystrokes, and makes customer service more user-friendly than ever before.

As a result, more people are using computers on the job. In the current workplace, there's a PC on almost every desk and computer-based technology on almost every manufacturing line. Though fewer than 25 percent of workers used computers on the job in 1984, nearly 50 percent did by 1993. In particular, information technology increases skill requirements among nonsupervisory workers because it's more widely distributed than previous technologies. A study of American manufacturing institutions found that if companies raised their proportion of nonsupervisory employees who use a computer by as much as one-third, that would increase overall productivity by 5.4 percent.

With more companies relying on computers, the skills that workers are most likely to learn on the job are computer related. Just under 40 percent of workers receive computer skills training from their current employers, only about one in



three receive professional or technical training, and an even smaller percentage receive management, sales, or service-related skills. In general, informal training on the job generally reaches more workers than formal training does. Regarding computer training, workers could use more of it, the evidence suggests. More than half of workers receive such training informally.

Not only are workers more likely to receive training in computer skills than other programs, but such training is more intensive. According to at least one study, each worker spends more than five hours in formal training to improve computer skills—twice as long as in other types of training.

New performance standards and new technologies also encourage high-performance organizational formats that expand worker autonomy, thus increasing skill requirements. The new economy builds higher quality standards into the production process, requiring more worker involvement and skill at every step, instead of gauging a product's quality by checking for defects at the end of the line.

To keep their competitive edge, modern organizations are constantly adapting to new technology and changing work formats. That means that employees in such organizations need constant training to update their skills. About 53 percent of all on-the-job training results from the need to adapt to changes in technology and work formats; an additional 26 percent is done to keep up with computer changes.

College as the threshold

The growth in highly skilled jobs in services, education, health care, and high-tech confirms that modern employers increasingly are demanding that job seekers have some college coursework or a bachelor's degree. Such credentials are fast becoming a prerequisite for training, as those who secure America's elite managerial, technical, and professional positions (people with a college background) gain access to technology and the type of formal and informal on-the-job learning that further increases earnings and other career advantages.

A clear link between college coursework and better jobs with higher earnings has emerged. Employer-based training enhances wages no matter what the employee's education level, but those in higher-wage jobs (people who tend to have more education) get more chances to be trained. Employees in occupations paying $25,000 or more a year make up just over half of the workforce, but they receive 72 percent of all formal training provided by employers. Meanwhile, people in less-skilled occupations have few training opportunities and are stalled on the road of modest earnings. The earnings premium for having or acquiring computer skills, in particular, increases dramatically with education level: High school dropouts experience a 15 percent earnings hike for computer skills; college graduates receive nearly twice that for similar skills.

Even in cases in which a candidate's degree doesn't match the job opening—such as a law student who applies for a management job—employers interpret college attainment as a sign of the ability to be trained and succeed. Because little is known about how to develop and assess general cognitive and behavioral skills in students and workers, employers tend to view a college degree as the best evidence of an applicant's potential.

Critical role

Employers play a pivotal role in the U.S. job-related education and training system. They use education and training provided by others and are themselves major training providers. In fact, employers are second only to four-year colleges and post-graduate programs in training workers for initial qualification in their jobs, and they remain the primary source of retraining to improve an employee's skills in a current job. Moreover, employer-provided retraining increases a worker's earnings more than retraining in schools does.

Still, the percentage of workers receiving company training is low. For the American economy to take the high road in a global economyæ in other words, produce quality products with a skilled workforceæ additional employer investment in training will be needed. Employers will also have to offer training to more workers, particularly those outside of the highly skilled and highly paid circles, and to workers in smaller companies. Less than half of the companies with fewer than 50 employees offer formal job skills training, while nearly all companies with at least 250 employees offer it.

Workers With the Highest Skills Receive the Most Training

Median Annual Earnings (1991 Dollars)	Distribution of the Workforce (1991)	Percent of Workers Who Received Formal Company Training (1991)	Occupations Included in Each Median Annual Earnings Levels (Percent of Training Received by Each Occupation)	Typical Level of Educational Attainment
$10,000 -$14,999	14.9%	5%	Services, except protective services (4.7%) Farming, forestry, fishing (0.5%)	High school diploma or less
$15,000 - $19,999	10.5%	5%	Machine operators, assemblers, and inspectors (4.0%) Handlers, equipment cleaners, and laborers (1.0%)	High school diploma
$20,000 - $24,999	19.9%	18%	Administrative support (15.0%) Transportation and material moving occupations (3.0%)	High school diploma
$25,000 - $29,999	28.2%	37%	Technicians and related support (5.0%) Sales occupations (13.0%) Protective service occupations (4.0%) Precision production, craft, and repair (15.0%)	Some college
$30,000 - $34,999	12.8%	19%	Executive, administrative, and managerial (19.0%)	Bachelor's degree
$35,000 +	13.7%	16%	Professional specialty (16.0%)	Bachelor's degree

Source: Bureau of Labor Statistics. 1992. *How Workers Get Their Training: A 1991 Update,* Bulletin 2407. Washington, DC: U.S. Government Printing Office. August

Employers will have to do considerably moreæ and spend moreæ just to maintain their current training commitments to highly educated employees. A conservative estimate of future training needs—based on training incidence by occupation level in 1991 and projected increases in jobs by occupation by 2005—is that employers will need to spend $78 billion on training in 2005. That estimate shows that to meet basic needs, employers will have to spend $15 billion more in 2005 than in 1991 on training costs, particularly in professional, technical, and administrative occupations.

Assuming that employers want to expand the number of employees being trained in order to make up for current training shortcomings, $15 billion is low. If employers, for example, were to increase the number of workers trained in 2005 to 50 percent of the workforce, the price tag of the additional training would be close to $80 billion. That could make the total employer-training expenditure as high as $143 billion.

America's economic success will continue as it masters the competitive advantages required to remain the world's preeminent services economy. There will be twists and turns along the way, especially if most employers continue to ignore the need to invest in their workforces in order to stay competitive. That means ensuring that workers, current and future, have the appropriate skills through training and lifelong learning. That can best be accomplished by putting in place programs that fill the gap between schooling and on-the-job training.

For employers, that may require spending more money on training and skill development to make more money, but it will be money well spent. For employers and educators, it will require a sustained partnership to ensure that the appropriate skills are being taught and a ready pool of talent awaits employers. For policymakers, it will require streamlined policies so that the optimal number of workers and students can receive the education and training they need. To do all of those things will be a challenge, but it will ensure that America's economy is not only ready for the 21st century, but ready to lead. ❑

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Facts and figures are from various sources, including the U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; U.S. Department of Labor, Office of the Chief Economist; Monthly Labor Review *(May 1995); and* Quarterly Journal of Economics *(February 1993).*