

By Edward Gordon

# The Global Talent Crisis

**Contrary to popular opinion, there are plenty of open jobs. What's missing are candidates with skills.**



ANGEL HERRERO DE FRUTOS / ISTOCKPHOTO

We are in the midst of a global job and talent upheaval, the most remarkable of any job and talent change since the Industrial Revolution and encompassing every aspect of the global economy.

The dawning of a new industrial age, a period characterized by a growing need for highly skilled technical workers, is driving this revolution. From now through the next decade and beyond, this need will grow at an unrelenting pace. This new age will require the reinvention of the education-to-employment system. Simply put, we need to prepare more people for jobs that are now being created by an ultra-high-tech economy. In the United States alone, this high-tech age could spur the economy to a GDP of \$20 trillion per year by 2019 (Congressional Budget Office estimate), compared with a little over \$14 trillion now. But progress is not guaranteed, and the bounties of success will not be evenly distributed.

In the United States, the official unemployment rate is projected to top out at near 10.5% by 2010. Factoring in the number of people too

discouraged to even look for work or file for unemployment, and the number of people working part time who wish to work full time, that figure now approaches 15%. Some 9 million people in the United States only have part-time work, up 83% from a year ago. Part-time workers account for almost 20% of the workforce. That number, too, will likely go up by next year. There will be jobs in 2010, but highly skilled and educated workers will have an easier time in a highly competitive environment.

This is a familiar refrain; we've been hearing alarms about the skills gap for years. But if ever there was a time to get serious about helping workers acquire the right skills, this is it.

## **Clearing the Decks: What Today's Downturn Means for Tomorrow's Job Market**

Over the last 10 years, the real U.S. economy did grow. Unfortunately, too much of the wealth created was based on short-term financial speculation all around the globe and the manipulation of exotic financial in-

struments. The tech-based U.S. economy failed to invest enough long-term resources to educate the nation's youth, preparing them to work in the next wave of emerging science, technology, engineering, or mathematically based (STEM) jobs.

While much attention has been focused on how many millions of low-skill U.S. jobs have been outsourced, little notice has been paid to how many millions of high-pay, high-skill tech jobs have been outsourced to Europe, Japan, Singapore, or other countries with well-educated labor pools. Meanwhile, U.S. businesses are importing STEM talent from abroad using H-1B visas to keep the nation's tech-based economy operating.

The United States has outsourced advanced technological production, design, and management capacity. Also, many U.S. industries have become over-reliant on H-1B "specialty occupation" visas to import workers from overseas. However, over the next decade, U.S. companies will have trouble building new high-tech factories in high-skill counties like South Korea, Japan, or Germany, be-

cause their workforces will have begun shrinking. In fact, many countries will probably bring more production into the United States if they can locate communities that have developed appropriate high-tech workforces.

At the same time, U.S. firms will still seek to use H-1B visas to bring engineers, technicians, and other professionals from China and India into the United States. Multiple studies have shown that China graduates about 600,000 engineers each year, but only 60,000 are educated at world standards. India graduates 400,000 new engineers each year, but only 100,000 are educated at world standards. The quality of educational institutions in India and China vary greatly, as they have not yet established the standards comparable to the United States for college/university accreditation. As the Chinese and Indian economies move up the high-tech value chain, they will have increasing difficulty supplying their own talent needs. Hundreds of thousands of foreign nationals are returning home from the United States and elsewhere. They are starting new tech-based businesses or taking advantage of rampant wage inflation driven by skilled worker shortages across China and India.

These trends mean that U.S., European, and Japanese firms will have increasing difficulty importing enough talent over the next decade. In the United States, business will lobby the government to increase the availability of H-1B visas. There simply will not be enough people to fill all the high-skill/high-wage jobs that are going to be vacant around the world.

Meanwhile, U.S. society has pushed many of its best and brightest students and mature workers into finance-related jobs that fed a massive short-term speculative bubble. Many other Americans have ended up in low-pay/low-skill service jobs because thousands of American schools are of substandard quality.

### In Search of Technical Talent

Today's U.S. employment picture is extremely muddled. In early 2008, when U.S. unemployment was at

5.6%, 3 million jobs remained vacant (i.e., jobs advertised for six months or more that remain unfilled). The vast majority of vacant jobs are STEM related. They require a good high-school education, plus specialized postsecondary career education, two-year or four-year college degrees, one- or two-year college occupational certificates, or a two- to three-year apprenticeship education.

By May 2009, U.S. unemployment had jumped to 9.4%. However, with more than 14 million unemployed, more than 3 million jobs were still vacant, according to Manpower. An analysis of unemployment by education levels helps show why. The unemployment rate for high-school dropouts was 15%, contrasted to 10% for high-school graduates, 7.7% for those with some college, and 4.8% for those with a bachelor's degree or higher.

Manpower's 2009 Talent Shortage Survey also reported that 30% of the world's employers are still facing a talent showdown. Tig Gillion, chief executive at Adecco, another staffing company, agreed that many business sectors were still hiring new people to fill STEM jobs. A *Fortune* magazine report highlighted firms that had openings for specific positions, including Boeing, Google, Genentech, Cisco Systems, Ernst & Young, Booz Allen Hamilton, KPMG, PriceWaterhouseCoopers, and many U.S. hospitals.

### What Do the Labor Shortages Look Like?

After the current recession ends, there will be a growing job crisis around the world due to these talent shortages. Demographic trends in the United States, Europe, Russia, and Japan show a drastic reduction in the pool of new highly skilled workers, due to low birthrates and massive retirements. As the global

need for talent grows, even China's and India's educational systems will not be able to produce enough qualified graduates for themselves, let alone act as safety valves for the rest of the world. But the heart of this issue is the seldom understood fact that the education-to-employment system worldwide is badly out of date. The United States and most

other nations are not producing enough graduates with the kinds of technical, communications, and thinking skills needed in the twenty-first-century workplace.

Without drastic talent creation changes between 2010 and 2020, the United States will experience a major talent meltdown, with 12 to 24 mil-

lion vacant jobs stretching across the entire U.S. economy. Businesses will leave the United States searching for scarce talent wherever they can find it. The U.S. economy will stagnate or shrink. For example, in the late 1990s, AMD (Advanced Micro Devices) wanted to build a new high-tech plant. They looked at locations in California and Texas, but company officials felt that the communities they investigated could not produce enough qualified entry-level technicians for their needs. The company went to Germany, built a plant near Dresden in 1999, and added a second in 2004. Germany was a good fit for AMD because of the high technical standards of Germany's dual education system.

The picture of the U.S. economy that emerges is of abundance and poverty: abundance of labor, poverty of talent, and economic pain everywhere. To prevent a chronic job imbalance and a true economic catastrophe, the United States needs to reinvent its talent-creation system.

### The Three Forces Driving the Talent Shortage

There are three socioeconomic

**"The picture of the U.S. economy that emerges is of abundance and poverty: abundance of labor, poverty of talent, and economic pain everywhere."**

# Green Jobs Under Your Nose

The jobs of the future are here today; you may even be qualified.

## Biochemists and Biophysicists

**What they do:** Research the chemical compositions and physiological processes of living cells and organisms.

**Education:** PhD in biochemistry or biophysics. A master's degree will qualify an applicant for some applied-research, management, and community-college instructor positions.

**Salary:** \$53,390 to \$100,060

**Job outlook to 2016:** Growth will be average, from 20,131 jobs in 2006 to 23,326 in 2016. Increases in federal spending on research have slowed considerably and will probably remain slow for the near future.

**Learn more:** Society of Environmental Toxicology and Chemistry, [www.setac.org](http://www.setac.org).

American Society for Biochemistry and Molecular Biology, [www.asbmb.org](http://www.asbmb.org).

## Chemical Engineer

**What they do:** Develop plant equipment and processes for manufacturing chemicals and consumer products.

**Education:** Bachelor's degree or master's degree in chemical engineering.

**Salary:** \$62,410 to \$98,100

**Job outlook to 2016:** In the United States alone, chemical-engineering jobs will increase from 30,444 in 2006 to 32,842 in 2016. The most growth will be in service-providing industries, such as professional, scientific, and technical services. Energy research, biotechnology, and nanotechnology will be particularly active growth fields.

**Learn more:** The American Institute of Chemical Engineers, [www.aiche.org](http://www.aiche.org)

Green Chemistry Institute, [www.chemistry.org](http://www.chemistry.org).

## Construction and Building Inspectors

**What they do:** Inspect buildings and structures for soundness and compliance with municipal and federal regulations.

**Education:** High-school diploma, plus experience in a skilled-trade profession.

**Salary:** \$36,610 to \$58,780

**Job outlook to 2016:** Heightened concerns over public safety and growing interest in sustainable design will generate impressive growth in this field, from 109,730 jobs in 2006 to 129,739 jobs in 2016. More than 48% of new jobs will be with state and local governments.

**Learn more:** American Society of Home Inspectors, [www.ashi.org](http://www.ashi.org).

International Code Council, [www.iccsafe.org](http://www.iccsafe.org).

## Environmental Engineering and Pollution-Control Technician

**What they do:** Modify, test, and operate pollution-control systems and devices.

**Education:** Associate's degree, though some positions do not require any formal training.

**Salary:** \$30,920 to \$53,250

**Job outlook to 2016:** The United States expects fast job growth in this market, from 21,126 jobs in 2006 to 26,362 in 2016. Corporations will need their expertise to comply with tighter federal regulations on hazardous waste and pollution. Population growth in major urban areas will further spur demand for better waste management.

**Learn more:** Association of Environmental Professionals, [www.califaep.org](http://www.califaep.org).

Green Engineering Jobs, [www.greenengineeringjobs.com](http://www.greenengineeringjobs.com).

MATT GOINS / LEXINGTON HERALD LEADER / MCT / NEWS.COM



**Green Jobs.** University of Kentucky biological engineer Czar Crofcheck is researching how to maximize the power potential of algae to replace gasoline in cars. A green job could include anything from enhancing the energy-efficiency of existing systems, such as home air-conditioning and heating systems, to discovering the power sources of the future.

forces driving us to a talent show-down: demographic declines in many industrialized nations, a skills gap because students and incumbent workers are not receiving the education and training needed for high-tech employment, and a cultural bias against undertaking the rigorous ed-

ucational preparation needed for scientific or technical employment.

• **Global demographics.** Throughout the industrialized world, birth-rates are very low and the proportion of baby boomers retiring is very high. This is a particularly important issue in western Europe and parts of

Asia. Replacement-level fertility (on a national level) is generally considered 2.33 children per female, but can be higher in countries with a significant infant-mortality rate. The CIA World Factbook estimates Germany's fertility rate now to be 1.4; Italy's, 1.31; Russia's, 1.41; Japan's

## Green Entrepreneurs and Consultants

**What they do:** Green entrepreneurs run businesses that provide green products and services. Green consultants provide their expertise and consulting services to paying clients.

**Education:** It varies. Most have extensive practical experience and an extensive skill set that they developed through formal education or training—such as a “green MBA,” which increasing numbers of private and public universities are now offering.

**Salary:** Some earn a minimal salary, while others earn well over \$100,000 a year.

**Job outlook to 2016:** This is a diverse field, and estimates vary widely on how many jobs it will hold. But all indicators are that they will be numerous. Michael Richmond, director of the Green Clean Institute, says that green consultant and entrepreneur is “likely the business career of the decade.”

**Learn more:** GreenBiz, [www.greenbiz.com](http://www.greenbiz.com).

*Sustainable Business* magazine, [www.edie.net/magazines](http://www.edie.net/magazines).

## Hydrologist

**What they do:** Study the circulation, distribution, and any pollution problems of natural precipitation and bodies of water.

**Education:** A degree (bachelor’s or master’s) in a natural science. High-level research positions often require a doctorate.

**Salary:** \$51,370 to \$82,140

**Job outlook to 2016:** Growth will be above average, from 8,314 jobs in 2006 to 10,377 in 2016, due to increased strains on natural ecosystems from human population growth. Hydrologists will be in demand for their abilities to determine the effects and concentrations of pollutants in soil and ground water. Private-sector consulting firms will be the most active employers.

Learn more: American Institute of Hydrology, [www.aihydro.org](http://www.aihydro.org).

Water Environment Federation, [www.wef.org](http://www.wef.org).

## Landscape Architect

**What they do:** Plan and design land areas such as parks, airports, highways, hospitals, schools, land subdivisions, and industrial sites.

**Education:** Degree (bachelor’s or master’s) in landscape architecture.

**Salary:** \$42,720-\$73,240

**Job outlook to 2016:** Learn more: As construction projects and land conservation efforts both pick up pace, so will hiring for landscape architects—from 27,389 jobs in 2006 to 32,402 in 2016. They will find many work opportunities in restoring wetlands and endangered sites, reclaiming land, preserving historic sites, and managing storm runoff caused by urban development.

**Learn more:** Association of Professional Landscape Designers, [www.apld.com](http://www.apld.com).

Council of Landscape Architectural Registration Boards, [www.clarb.org](http://www.clarb.org).

## Refuse and Recyclable Material Collectors

**What they do:** Collect, and dispose of, communities’ refuse and recyclable scrap materials.

**Education:** Some employers require a high-school diploma.

**Salary:** \$21,550 to \$38,490

**Job outlook to 2016:** The occupation will likely see average growth, from 135,970 jobs in 2006 to 146,047 in 2016. Many job vacancies will be the result of workers switching jobs or retiring.

**Learn more:** National Recycling Coalition, [www.nrc-recycle.org](http://www.nrc-recycle.org)

Recycler’s World, [www.recycle.net](http://www.recycle.net).

Source: *Green Careers: Choosing Work for a Sustainable Future* by Jim Cassio and Alice Rush. New Society Publishers. 2009.

and South Korea’s, 1.21. This means that the working-age populations in these countries will shrink and have to support higher and higher numbers of retirees.

Shifts in generational values are magnifying the impact of demographic declines. Generations X and

Y don’t have the same ethos regarding work as their parents did. The baby boomers seemed to live to work and shop. They put up with long hours in exchange for big salaries. That’s changing. Many boomers are looking to work less hard as they age, although many may be forced to

delay retirement due to declines in investments and pensions. Generation X in particular is more interested in obtaining a good work-life balance. Women are graduating from institutions of higher learning at higher rates than are men, and many want time off to raise children. They

want to work at home, flex hours, sabbaticals, and job sharing, but they also want pay parity with men. Many companies are having trouble dealing with those issues.

- **The skills gap.** Since the original publication of *A Nation at Risk* in 1982, reports continue to be issued about serious deficiencies in American education. In this age when some form of postsecondary education is a requirement for all but low-wage, low-skill jobs, the overall U.S. high-school dropout rate continues to hover around 30%. Even more alarming, the average high school graduation rate in the 50 largest U.S. cities was 52.8%. In a 2005 survey, 60% of American manufacturers reported that even those high-school students who did graduate were poorly prepared for entry-level jobs.

According to a 2008 Alliance for Excellence in Education report, only half of the 1.4 million twelfth graders who took the ACT tests were ready for college-level reading. Some 42% of public community college freshmen and 20% of freshmen in public four-year institutions need to take remedial courses in basic skills such as reading, writing, and math. Moreover, only 25% of Americans who begin postsecondary education ultimately obtain a full college degree. This is the lowest “survival rate” in any of the major developed countries.

- **A cultural bias.** A bias exists

against gaining the education and training required for science and technology jobs, but not against technology itself.

What’s truly amazing is the number of people who love technology—iPods, iPhones, laptops, Twitter, podcasts—but due to cultural reasons, they don’t acquire the training to design, repair, or manage the technology. This is now true even in Japan, where they call this phenomenon “the flight from science.” Even the tech-driven German economy in 2008 was experiencing a shortage of 75,000 engineers to fill vacant positions.

The baby boomers’ formative years were marked by the Cold War arms race and by the space race. The National Defense Act funded a variety of math and science programs in elementary and high schools as well as higher education career programs. This, in turn, supported a major expansion of science and technology across the entire U.S. economy. NASA put men on the moon in 1969 and during the early 1970s; the Soviet Union collapsed in 1991. These events brought an end to much of the U.S. government emphasis on technological expansion. The next generation received far less encouragement to consider these STEM careers.

Starting in 2010, 79 million baby boomers (born between 1946 and 1964) will begin the shift to retire-

ment. As a result, between 2010 and 2020, some technology-based industries will be seeking to replace 100% of their workforces. Overall, 66% of the jobs to be filled during the next decade will be vacancies created by boomer retirements.

Advancing technologies are transforming the nature of occupations. All the skilled trades and many installation and repair positions now require the use of advanced technologies that continue to evolve at a rapid pace.

The number of new technologies introduced over the next decade will likely be equal to those invented over the last 50 years. Yet the current breakdown in the global talent-creation systems does not bode well for the future.

## Rebuilding the Talent Pipeline

If between 2010 and 2020 the U.S. education-to-employment system remains unchanged, the United States will see increasing numbers of people, even degreed individuals, with poor job prospects.

Can this gloomy scenario be avoided? Businesses, educators, and unions will all have to play a far more active role in expanding the proportion of highly skilled Americans to fill this widening STEM talent shortfall, and attract new businesses into every American community. The problem demands much broader investment by large and smaller businesses through updated career education systems formed in partnership with other community leaders.

At the national level, the U.S. Congress can encourage these community investments by allowing businesses to depreciate investments in training and education, just as they now depreciate investments in plants and equipment. This will encourage a significant increase in employee training, particularly for entry-level jobs. Businesses will also have an incentive to invest in career information and education programs in community elementary, secondary, and postsecondary institutions to rebuild the shattered education-to-employment pipeline. Currently, U.S. businesses invest around \$53 billion an-

## Measuring the Gap

Current data show that 62% of all U.S. jobs are high-pay and require higher skill levels. Ninety-seven million people are needed, yet only 45 million Americans will be qualified for such positions. Businesses plan to make up the difference by using the failing talent safety valves of outsourcing and H-1B visas to import skilled workers. At the other side of the spectrum, 38% of 2010 jobs will be low-pay/low-skill requiring 61 million American workers, but over 100 million workers will be candidates for such jobs.

By 2020 the labor market will be clearly out of balance. Indications are that 74% of all jobs will be high-pay/high-skill, with 123 million people needed, but only 50 million Americans are expected to be qualified for them. On the other hand, low-pay/low-skill jobs are forecast to shrink to only 26% of total U.S. jobs. Only 44 million people will be needed, but if current trends continue, more than 150 million Americans could fall into this category of low job-skill readiness.

—Edward Gordon

nually in training and education. This could grow to \$100 billion if such initiatives prove successful.

Across America, numerous community-based organizations (CBOs) and nongovernmental organizations (NGOs) have been at work for more than a decade expanding business-education partnerships. They have mobilized the broad participation of chambers of commerce, unions, parent organizations, workforce boards, economic-development organizations, professional and trade associations, and other community groups. In Santa Ana, California; Fargo, North Dakota; Danville, Illinois; Mansfield, Ohio; and in many other communities, these local CBOs and NGOs are now making significant local investments to reinvent the local and regional education-to-employment systems. They have helped businesses stay competitive through worker retraining and elementary/secondary/postsecondary career-education programs. These CBOs and NGOs are rebuilding talent pipelines and helping to attract new businesses offering higher-wage, higher-skilled jobs for their communities.

The long-term goal of these CBOs and NGOs is very simple. They seek to change the education and training systems in their own communities and then the mandates in their states so that all elementary, high school, and postsecondary schools will be able to offer the educational and training programs that realistically support a knowledge economy.

The global talent showdown will affect entire economies, and it will be felt by everyone. We must all be part of the solution. □



#### About the Author

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To read an interview with Edward Gordon, go to [www.wfs.org/futurist.htm](http://www.wfs.org/futurist.htm).

**By Alexandra Levit**

## The Future World of Work: A Gen Xer's Perspective

**Wall Street Journal columnist Alexandra Levit parses today's and tomorrow's job market for new grads.**

For those of us who are members of generations X (born between 1961 and 1980) and Y (1980–early 1990s), the future I always dreamed about is coming up fast. Our careers are relatively young, and for those still in college, they haven't even begun yet. But already, technology is changing so quickly that we can easily imagine future work lives that barely resemble the ones we lead today. As our baby-boomer parents age, we will become the leaders in an increasingly complex world.

If we want to create thriving, sustainable careers that will easily withstand the turbulence of the next few decades, we must anticipate the qualities of the future work world. Here are a few ideas based on my own experiences and my conversations with other workplace experts.

- **Who we'll be working with:** In the coming decades, the baby boomers will start retiring from their management positions in droves. We will have to contend with the "brain drain" from those who leave the workforce, boomers who remain employed underneath us for money or personal fulfillment, and a large influx of immigrants.

- **Who we'll be working for:** In the last decade, as American companies have laid off millions of workers, the ideals of job security and employee loyalty no longer apply. In the knowledge-driven economy of the future, large organizations won't be needed to create value, and our livelihood won't be connected to a single corporation. We'll work for much smaller organizations that outsource everything but the business's core area of expertise, and more than half of us will eventually become contingent workers, employed part time or as freelancers or consultants.

- **Where we'll be working:** We've already seen the model of everyone at the same place, at the same time, begin to disappear. Now that we can be connected regardless of our physical location, work activities will be distributed across central offices, remote locations, and community locations. The typical eight-hour workday will be spread across a 14-plus-hour window to allow us to attend to needs at home and work with colleagues abroad.

- **How we'll be working:** Our future workplace will be one of constant change, innovation, and skill upgrading. Work projects will begin with one set of goals, but will reinvent themselves over and over again, so we'll be forced to think on the fly. Workers at all levels of the organization will be responsible for devising creative strategies, and cross-functional teams will be assigned for individual projects.

- **What we'll be working on:** Future employers will rely on individuals who are willing to work flexible hours and can leverage the latest technologies associated with an Internet-oriented, nonstop marketplace. Technical skills will only increase in importance, and as organizations continue to flatten, people in all areas of the business will be responsible for administrative skills like budgeting, hiring, and operations. From Generations X and Y, the organizations' leaders will expect individuals who understand human behavior, can engender cooperation, and can bring out the best in workers.

Sounds like an exciting time, doesn't it? I think I'm going to look forward to "going to work" in 2025. □



#### About the Author

Alexandra Levit is a *Wall Street Journal* columnist and the author of *Success for Hire* (ASTD Press, 2008) and the forthcoming *New Job, New You* (Random House, 2010). She speaks to organizations around the globe about generational workplace issues. Web site [www.alexandralevit.com](http://www.alexandralevit.com).

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