What D'Ya Know?

LIFETIME LEARNING
IN PURSUIT OF THE AMERICAN DREAM

FEDERAL RESERVE BANK OF DALLAS ■ 2004 ANNUAL REPORT
Years ago, high school sweethearts Jack and Jill went off to different colleges after being named king and queen of the senior prom. Now they’re both 45. He earns $47,000 a year as an assistant shoe store manager; she makes $154,000 as an advertising executive.

Jack got by without studying much in high school, making C’s and the occasional D while captain of the football team. He quit college after two years and has hopped from one job to another ever since. Jack’s always grumbled about his work. He finds his current job tedious and complains that it doesn’t pay as much as the previous one. After work, he’s either stretched out on the couch watching TV or hanging out with his buddies at Mike’s Sports Bar. He tells friends he’s still waiting for his “big break.”

Jill got A’s and B’s in high school by hitting the books and spending a few hours a day in the library. She continued her good study habits in college, where she earned a bachelor’s degree in advertising and then an M.B.A. Every place she’s worked, Jill’s honed her skills, not only to do a better job but also to prepare for the next step up. After working out at the gym several nights a week, she and her husband sometimes join friends for dinner. Other evenings, Jill takes classes, plays piano or catches up on her work.

Most of us know people like Jack and Jill. No matter what their names, these two archetypes provide object lessons in how to achieve the American Dream of opportunity, upward mobility and rising living standards.

The Jacks we know start as apathetic students, then treat their jobs casually. They want money and other rewards but put little effort into improving their skills. When work isn’t satisfying, they bellyache about life not being fair.

The Jills do better in the workplace because they study hard in school, build their strengths on the job and take responsibility for personal development. Most important, they never stop learning.

Each of us chooses. We can be like Jack—neglect learning and settle for a
lifetime of complaining that holds us back. Or we can be like Jill—committed to the kind of lifetime learning that feeds success.

Jack and Jill started in the same place, at the same time. Their paths diverged because of different attitudes toward learning. Those attitudes go a long way toward explaining the gap in their paychecks.

You earn what you learn. Our parents, teachers and guidance counselors told us this fact of economic life. They encouraged us to get the most from school and always pursue new skills and knowledge. Many of us followed their advice, and America’s free enterprise prosperity rests on one of the world’s most educated, most highly skilled workforces.

In the future, learning will be even more important to the nation’s economic success. We will live and work in an increasingly knowledge-based, global economy. Competition will intensify and the pace of change will quicken, requiring workers to continually upgrade their skills. Our jobs and living standards will depend on becoming even better at lifetime learning.

The challenge starts with improving our schools, so that they prepare us for the next generation of work. As important as education is, it won’t be enough. On average, Americans spend just 4 percent of their lifetime waking hours in the classroom—too little to learn what they’ll need for decades in a rapidly changing job market.

So we face a second challenge, one just as important as upgrading formal education. We need to put more effort into learning outside the classroom, so we’ll be equipped to seize opportunities in a dynamic world. The economy can’t create better jobs if America doesn’t produce workers qualified to fill them.

What d’ya know?

We toss out this casual greeting all the time, not really inviting a serious response. When it comes to America’s economic future, though, no question carries greater weight. How we answer it holds the key to good jobs and high pay.

What d’ya know?

Not enough.

We can never know enough in the modern workplace. A good education serves as the foundation for productive work. Job experience and training build on it. Lifetime learning offers a well-marked path to success. It’s up to us to follow it.
Any number of factors can determine a person’s fate in the job market. Studies suggest taller men and more attractive women earn higher pay. Some of us are born into the family business. Others are just in the right place at the right time. We can’t count on genetics, inheritance or luck, but nothing beats knowledge as a reliable route to greater earnings.

American workers get off to a good start with schooling—the more the better. Among employees aged 25 to 34 in 2003, high school graduates earned an average of $9,726 more a year than the barely educated—those who didn’t even finish ninth grade. The income premium increased to $13,977 for some college, $16,673 for an associate’s degree and $29,806 for a bachelor’s. It reached $38,899 for a master’s, $50,064 for a doctorate, and $61,984 for law, dentistry and other professional degrees. (See Exhibit 1 on page 8.)

Salaries rise as workers add experience and knowledge. We can get training in the workplace. We can take classes at universities and community colleges. We can read work-related books and search the Internet for industry information. Every day, we can improve by applying ourselves, asking questions and seeking mentors.

It pays off. Today’s young Americans are more educated than their predecessors, but we can’t overlook the value of experience. With only a short time in the workforce, Americans aged 25 to 34 earned an average of $46,795 in 2003. Those with more work years had time to build job skills. As a result, average pay grew to $63,818 for those 35 to 44. And it kept rising—to $64,739 for ages 45 to 54 and $67,721 for ages 55 to 64. All told, what Americans learned over their working lives added an average of $20,926 per year from the youngest group to the oldest.

Education leverages the value of experience, creating a kind of one–two punch. Among Americans whose formal education ended with high school, incomes increased with time on the job, topping out at $7,237 a year more for workers aged 55 to 64 than those 25 to 34.

The earnings edge for the oldest group of workers increased to $11,342 with some college, $17,447 for college graduates, $19,533 for master’s degrees and $42,778 for doctorates. Workers aged 55 to 64 with professional degrees made $70,399 more than their least experienced colleagues.

The benefits of education and experience really show up over the long term. Working 40 years, high school graduates earn an average of $1.5 million. The long-term payoff rises to $2.6 million for finishing college, making a bachelor’s degree a four-year investment worth $1.1 million. Gains continue to rise with more education—to $3 million for a master’s, $4 million for a doctorate and $5.3 million for a professional degree.

Unemployment data confirm the advantages of education and experience. Jobless rates are lower for workers with more years of schooling, largely because they’re more in demand. Among 25- to 34-year-olds, for example, only 3 percent of Americans with bachelor’s, master’s, doctoral and professional degrees were unemployed.
in 2003—about half the rate for the overall economy.

Unemployment rises to nearly 12 percent for high school dropouts. The good news for this group, though, lies in the rate’s steady decline as workers gain experience. Among dropouts aged 55 to 64, the unemployment rate retreats toward the national average, suggesting that even workers who start out at a disadvantage can gain the skills, talents and traits to make them valued employees. They earn lower salaries than more-educated workers, of course.

EXHIBIT 1

Our Wealth of Knowledge

EDUCATION PAYS, AND SO DOES EXPERIENCE

Americans raise their earnings by learning both in school and on the job. Moving down the columns shows the average gains from education. Going across the rows indicates the benefit of added years on the job; the bottom row, how experience pays off for the labor force as a whole. Reading down the second to last column shows that more-educated workers enjoy the largest returns as they gain experience. The last column summarizes the combined effects of education and experience on lifetime earnings.

<table>
<thead>
<tr>
<th>Education level</th>
<th>Average annual earnings in 2003</th>
<th>Experience premium 25–34 to 55–64</th>
<th>Estimated lifetime earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ages: 25–34 35–44 45–54 55–64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 9th grade</td>
<td>$21,839  $23,945  $25,167  $26,685</td>
<td>$4,846</td>
<td>$976,350</td>
</tr>
<tr>
<td>High school dropout</td>
<td>25,316  29,177  29,779  30,798</td>
<td>5,482</td>
<td>1,150,698</td>
</tr>
<tr>
<td>High school graduate</td>
<td>31,565  36,922  38,235  38,802</td>
<td>7,237</td>
<td>1,455,253</td>
</tr>
<tr>
<td>Some college, no degree</td>
<td>35,816  43,469  46,140  47,158</td>
<td>11,342</td>
<td>1,725,822</td>
</tr>
<tr>
<td>Associate’s degree</td>
<td>38,512  45,594  48,253  47,778</td>
<td>9,266</td>
<td>1,801,373</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>51,645  67,471  68,509  69,092</td>
<td>17,447</td>
<td>2,567,174</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>60,738  77,622  77,767  80,271</td>
<td>19,533</td>
<td>2,963,076</td>
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<tr>
<td>Doctorate</td>
<td>71,903  110,564 101,110 114,681</td>
<td>42,778</td>
<td>3,982,577</td>
</tr>
<tr>
<td>Professional degree</td>
<td>83,823  139,597 147,777 154,222</td>
<td>70,399</td>
<td>5,254,193</td>
</tr>
<tr>
<td>Equally weighted average</td>
<td>$46,795  $63,818  $64,739  $67,721</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SCHOOLING, EXPERIENCE REDUCE UNEMPLOYMENT

Americans with more education are less likely to be out of work. Unemployment among high school dropouts aged 25–34 is more than three times as high as it is for college graduates. Jobless rates converge for older workers, indicating that experience improves employment prospects for less-educated workers.
America’s track record verifies that capitalism and education make a good team. Per capita income has moved steadily upward since World War II, as more Americans have graduated from high school and pursued higher education. Per capita income across states shows the same strong positive relationship with the population that has bachelor’s degrees or better. This holds true around the world, too. The United States and other nations that rank high in years of schooling generate higher GDP per capita than less educated countries. (See page 12.)

HELPING ECONOMIES GROW RICHER

Going from individuals to economies, we see per capita income moving upward over time as Americans became better educated, indicated by a higher rate of finishing college (top). States with more college graduates also enjoy higher income (bottom). The solid line summarizes the overall positive relationship between college graduates and states’ income.
Why does knowledge pay off so handsomely for Americans?

We’re not necessarily any smarter than the rest of the world, but we’re fortunate to live in a country with a dynamic economy, one offering vast opportunities and rewards for individual initiative. In turning learning into earning, America’s free enterprise system matters as much as education and experience.

Our market economy rewards workers according to the value of what they produce. Formal education gives employees knowledge that makes them more productive, so they receive higher incomes. Learning by doing and workplace training make workers more productive, too, and they see it in their paychecks.

The impetus for productivity comes from the quest for profits. Companies gain by hiring workers with the education and skills to work a better way. Self-interest gives companies the incentive to recruit, train and reward the most productive workers, just as it motivates workers to learn and become more skilled.

Modern market economies create a demand for knowledge, but they don’t put the same value on all education. Capitalism’s invisible hand nudges workers toward the economy’s needs by sending dollars-and-cents signals on how much society values one type of knowledge relative to another.

In 2004, starting salaries for graduates with bachelor’s degrees averaged $78,993 in pharmacy, $52,539 in chemical engineering, $49,036 in computer science, $41,058 in accounting and $38,920 in nursing. Other disciplines aren’t as lucrative. On their first jobs, graduates in English earned $31,113; in history, $30,344; in psychology, $28,230; and in journalism, $26,758. (See Exhibit 2.)

Market-driven earnings disparities also exist in occupations that usually don’t require a bachelor’s degree. Workers make an average of $95,272 as air traffic controllers, $71,444 as real estate brokers, $59,795 as dental hygienists and $57,077 as elevator repairers. Learning remains the key, of course. Air traffic controllers go through a rigorous training program, often in the military. Real estate brokers and dental hygienists take courses to prepare for licensing exams. Vocational schools and companies teach elevator maintenance.

Highly paid noncollege workers have found ways to acquire knowledge, talents and skills that meet the test of the marketplace. Those who don’t invest time and effort in learning earn a lot less—$18,055 as parking lot attendants, $19,373 as sewing machine operators and $20,763 as janitors. All are well below the average U.S. income of $36,999 a year.

Using carrots and sticks, market-based economies put a high rate of return on learning. Nations without a tradition of economic freedom tend to lag in transforming knowledge into income. Nonmarket nations don’t tie wages to productivity. They might educate their workers, but pay doesn’t induce society to use knowledge effectively.

Still plagued by the legacy of three generations of central planning, Russia manages just a fifth of U.S. per capita GDP, although it averages only two fewer years of schooling. Poland, Romania and Bulgaria also trail in
A free enterprise economy doesn’t place equal value on all learning. Among college graduates (left), starting salaries vary widely for different majors—from $26,758 in journalism to $78,593 in pharmacy. Pay differentials encourage students to major in disciplines highly demanded in the economy.

Markets offer the same kinds of incentives for jobs that usually don’t require four-year degrees (right). Average incomes range from $95,272 for air traffic controllers down to $34,046 for auto mechanics. Learning still carries weight. The best-paid noncollege workers have acquired specialized skills through the military, vocational schools or on-the-job experience. Workers with the least education earn the lowest pay.

<table>
<thead>
<tr>
<th>AVERAGE STARTING SALARY FOR BACHELOR’S DEGREE</th>
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<tbody>
<tr>
<td>Pharmacy</td>
</tr>
<tr>
<td>$95,000</td>
</tr>
<tr>
<td>Petroleum engineering</td>
</tr>
<tr>
<td>$85,000</td>
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<tr>
<td>Chemical engineering</td>
</tr>
<tr>
<td>$75,000</td>
</tr>
<tr>
<td>Computer science</td>
</tr>
<tr>
<td>$65,000</td>
</tr>
<tr>
<td>Actuarial science</td>
</tr>
<tr>
<td>$55,000</td>
</tr>
<tr>
<td>Mathematics and statistics</td>
</tr>
<tr>
<td>$45,000</td>
</tr>
<tr>
<td>Accounting</td>
</tr>
<tr>
<td>$35,000</td>
</tr>
<tr>
<td>Economics and finance</td>
</tr>
<tr>
<td>$25,000</td>
</tr>
<tr>
<td>Marketing</td>
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<tr>
<td>$15,000</td>
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</tbody>
</table>

<table>
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<tr>
<th>AVERAGE SALARY FOR EXPERIENCED WORKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air traffic controller</td>
</tr>
<tr>
<td>$95,000</td>
</tr>
<tr>
<td>Real estate broker</td>
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<tr>
<td>$85,000</td>
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<tr>
<td>Fashion designer</td>
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<tr>
<td>$75,000</td>
</tr>
<tr>
<td>Dental hygienist</td>
</tr>
<tr>
<td>$65,000</td>
</tr>
<tr>
<td>Elevator repairer</td>
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<tr>
<td>$55,000</td>
</tr>
<tr>
<td>Construction supervisor</td>
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<tr>
<td>Flight attendant</td>
</tr>
<tr>
<td>$45,000</td>
</tr>
<tr>
<td>Electrician</td>
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<tr>
<td>$35,000</td>
</tr>
<tr>
<td>Brick mason</td>
</tr>
<tr>
<td>$25,000</td>
</tr>
<tr>
<td>Crane operator</td>
</tr>
<tr>
<td>$15,000</td>
</tr>
<tr>
<td>Auto mechanic</td>
</tr>
<tr>
<td>Highway maintenance worker</td>
</tr>
<tr>
<td>Barber</td>
</tr>
<tr>
<td>Janitor</td>
</tr>
<tr>
<td>Sewing machine operator</td>
</tr>
<tr>
<td>Parking lot attendant</td>
</tr>
</tbody>
</table>
making education pay off. (See Exhibit 3.)

Communist North Korea and Cuba boast relatively high levels of education, but their moribund, state-dominated economies offer few opportunities to put knowledge to use making money. The average North Korean gets more than nine years of schooling—about equal to the average Brit—but the country’s per capita GDP is only $1,083. Cuba’s eight years of education yield only $1,841 per person. The typical Spaniard is slightly less educated, but the country’s per capita GDP is 12 times higher than Cuba’s. The difference lies in Spain’s move to capitalism a generation ago.

Today, more countries than ever are in the capitalist camp, but America stands out with one of the world’s freest labor markets. More than most other nations, we allow companies the freedom to hire and fire. Employers decide how many workers they need, so they’re not stuck with unproductive or unnecessary people on the payroll. At the same time, workers are free to leave one job for another in search of higher pay, greater satisfaction or career advancement.

Knowledge can’t achieve its full economic potential without labor market freedom. Germany, Italy, France and other countries impose barriers that slow the movement of workers, such as lengthy appeals before layoffs and government-mandated severance packages. These policies, though well-meaning, interfere not only with the quest for productivity but also with incentives to learn.

When companies and workers are free to make job decisions, scarce labor resources are channeled to their best uses, making the economy more productive and allowing learning to yield greater dividends. What we know matters. Just as important, though, is an economic system that puts our knowledge to work.

**EXHIBIT 3**

**Ignorance Is Misery; Knowledge Is Bliss.**

Free economies get the most out of education. The top quarter of the 108 nations in the Index of Economic Freedom (in green) cluster toward the top of the chart, indicating they’re getting a lot of per capita GDP from years of schooling. The least-free quarter (in orange) tend to get less from their education, which pushes them toward the bottom of the chart. The remaining countries (in purple) make up the middle two quarters of the index.

The solid lines summarize the positive relationship between years of schooling and per capita GDP for the three groups of countries. Nations above the line of their peer group are getting higher returns on schooling. Being below the green line suggests Americans aren’t getting as much income as we could from our years in the classroom.
Knowledge didn’t fuel America’s economy in the past. The Industrial Age thrived on man’s mastery over machine. Most work required steady hands to operate factory equipment and minds geared to such repetitive tasks as measuring and counting.

A basic education—the three R’s of reading, ’riting and ‘rithmetic—sufficed for most jobs. Over the course of workers’ careers, jobs changed little, so talents acquired in youth often served until retirement. Lifetime learning didn’t matter all that much.

America has left the Industrial Age behind. Factory work is increasingly being performed in other countries; much of what remains in the United States is highly technical, relying more on sharp minds than nimble hands.

Today, services dominate the U.S. workplace, providing 80 percent of the nation’s jobs. Some of the work requires only basic skills, but many other jobs require an ability to handle complex tasks in marketing, finance, sales, law, research and business consulting. The skills of the Industrial Age aren’t a good fit for these jobs. Only by upgrading their talents will Americans be ready to make the most of what our economy offers in the Information Age and beyond.

The transition entails moving up the hierarchy of human talents.¹ In the early stages of the country’s economic development, most work required muscle power to lift, tote, push and pull. As industry replaced agriculture, more workers found their niche with manual dexterity and formulaic intelligence.

Postindustrial nations are shifting workers to more sophisticated jobs that require analytical intelligence, imagination and creativity, and the ability to interact with others. The work relies on brains rather than brawn. While the talents are less bookish than the traditional three R’s, education experts insist they can be taught—with the right techniques.

Maintaining a comparative advantage in a modern economy requires that schools do a better job fostering creativity and people skills. Equally important, these skills have to be kept sharp in a world of rapidly changing tastes and technology. We can’t just get a good education while young and expect it to suffice for an entire career.

The transformation of the way we work gives intellectual capital precedence over the physical capital that once drove the U.S. economy. Both kinds of capital make us richer, but they differ in important ways.

Physical capital grows when businesses invest in buildings, machinery and other productive assets. These are largely management decisions, and the process usually takes just a few months or years. To expand intellectual capital, we invest in human beings over decades—from learning the ABCs in preschool to mastering the latest computer programs at the office.
Companies make important contributions to creating intellectual capital, but workers must assume a large part of the responsibility. No one can learn for us. We have to supply the effort to develop our skills.

Knowledge is ultimately the property of the employee, rather than the enterprise. Workers take it with them when they switch jobs, a factor that limits companies’ ability to capture the benefits of investing in human capital. As a result, workers can’t count on employers to provide all the training they’ll need. They must be active participants in their own education, engaging in lifetime learning on their own.

The age of intellectual capital carries important lessons for American workers. First, education and experience pay off more today than they did yesterday. In 1974, high school graduates with about 40 years’ experience earned an average of 57 percent more than those with less than a ninth grade education and only a few years on the job. By 2003, the bonus for work experience had widened to 78 percent.

For those with bachelor’s degrees, the added value of 40 years’ experience rose from 131 percent in 1974 to 216 percent in 2003. After five years or more of college, the premium for 40 years’ work rose to 350 percent, up from 185 percent a generation ago.

The pattern holds for all levels of schooling and age groups. By offering increasingly higher financial rewards, markets are prodding Americans to get more education and experience.

Second, the benefits of experience extend deeper into life today. A generation ago, earnings were highest for those aged 35 to 44. Markets, in effect, decreed that older workers weren’t as valuable as younger ones. This reflected the prevalence of work
that required physical skills. Job performance deteriorated as workers’ bodies fell prey to the effects of aging.

In an economy growing more knowledge-intensive, workers continue to earn more as they grow older. Today, earnings are highest for those aged 55 to 64. Unlike the body, the mind doesn’t peak at midlife. It retains the capacity to learn.

Knowledge builds on itself, like compound interest. College-educated workers show the largest gains as they accumulate experience in the labor force. The slowest growth in lifetime earnings occurs among high school dropouts, those least apt to develop a discipline for learning.

Third, intellectual capital depreciates, just like physical capital. Knowledge that once held economic value can lose favor in the marketplace. Calculators and computers, for example, have made quaint art of the ability to use a slide rule to solve math problems. These days, there’s little need for the skills of railroad porters and elevator operators.

As some skills wither, others blossom. A modern economy needs workers who can design computer games, route bar-coded packages overnight and correct astigmatism with laser surgery. Technology raises the bar on what we need to know. When few employees used a computer at work, only secretaries needed to type. Now, hundreds of occupations involve writing e-mails and entering data. Millions of people do it every day.

The knowledge needed to excel at today’s jobs marches forward, sometimes at a bewildering rate. In a fast-paced economy, being out of the workforce exacts a high toll. Unemployed workers can lose ground without access to on-the-job learning. The more time they spend out of work, the more their wages fall behind. Upon reemployment, workers earn lower wages because they offer less experience and have lost touch with the job market’s changing demands. Those on the sidelines for long stretches sometimes never catch up.

Americans will continue to reap the benefits of knowledge only by replenishing their depreciating skills. That’s part of the reason lifetime learning carries great weight in today’s economy.

Putting Together the Education Puzzle

America offers an abundance of options for lifetime learning—from parents and preschool to adult education and advanced degrees. Each of us must find the pieces that fit the jobs we want.
Iconic images of one-room prairie schoolhouses, noisy neighborhood classrooms and ivy-covered colleges belie the fact that the United States emerged as an economic superpower without overwhelming brainpower.

For most of the nation’s history, Americans were largely self-educated, if at all. In 1940, only a quarter of the population in their prime working years had graduated from high school and 5 percent held college degrees. As recently as 1965, half of U.S. workers still lacked a high school diploma. (See Exhibit 4.)

We’re much better educated now. High school and college graduation rates are at all-time highs. Dropout rates have fallen to record lows. Americans have put enormous time, effort and money into education—not surprising, given that learning’s rewards are big and consistent.

Over the years, we’ve built an extensive infrastructure to deliver the knowledge vital to our sophisticated, growing economy. The supply of learning activities arose in response to demand, expressed through both private markets and the political process.

Children begin learning in the home—and from the world around them—the day they are born. America’s formal learning assets start with the educational system—the preschool programs, elementary and secondary schools, community colleges, universities and professional schools that cater primarily to younger people. Schools are public, private, state-chartered and home-based. In 2003, enrollment from kindergarten through graduate school reached nearly 70 million—a quarter of the U.S. population.

In terms of time spent in school, the United States ranks as the world’s most educated nation, an average of 12.3 years per person. It leads in college graduates, too, at 28 percent of the population age 25 and over.

Knowledge doesn’t come cheap. The United States leads the world in education spending, with $11,480 per student on public and private schooling at all levels.

Millions of Americans are also learning through military training and vocational schools that teach everything from computing to the culinary arts. The Internet puts a staggering amount of information at our fingertips, providing opportunities for self-paced instruction. In 2003, 2.6 million U.S. students took college classes online.

People also learn later in life through adult education. Half of workers over age 16 took job-related courses in 2001, testimony to Americans’ drive for success. Participation was highest among workers with more years of formal education. They also earn the most, suggesting that higher pay increases the incentive to learn.

Most companies offer some sort of training to build employees’ skills in computers, management, communications and other areas. In 2004, per worker corporate spending on in-house education reached $370, compared with $52 two decades earlier. A growing industry provides companies with outside trainers and consultants who bring proven concepts and techniques to workplace education programs.

From kindergarten through adult education, Americans are busy expanding their knowledge. Our efforts have helped forge a high-quality labor force, but a 21st century economy will demand even more.

The challenge starts with our schools. For decades, studies have

Perhaps more alarming, American students fare worse the more time they spend in school. Fourth-grade students rank close to the top on international tests. By eighth grade, students have slipped into the middle of the pack, but they at least score above the international average in math and science. By the 12th grade, U.S. students’ performance has dropped off sharply, falling well below the international average in the two subjects. (See Exhibit 5 on page 18.)

These middling results are all the more glaring because the United States spends a lot of money on education. The Czech Republic, with just a third of the financial resources for secondary schools, produces students whose test scores equal Americans’. Australia, Canada, Finland, Japan, South Korea and other countries get more educational quality, as measured by test scores, for less spending per student.

U.S. schools may possess strengths that international tests fail to capture, but the data on the basics suggest a harsh lesson. The United States has quantity in education, leading the world in years of schooling. But it trails other countries in quality.

Take another look at Exhibit 3, which shows how years of schooling and economic freedom impact per capita GDP (page 12). The United States lies below the green line that reflects its peer group of most economically free countries. How can that be? America ranks above average in that group, in both schooling and economic freedom.

The answer lies in the other factors that influence GDP. Nations with abundant natural resources tend to do better than the standard for their group. Oil producers Iran and Venezuela, for example, sit well above the line for the least-free countries. Tourism can provide a similar economic boost, suggesting why Spain, Italy, Greece and Portugal outperform their freedom-index peers.

Now take Japan, a country more efficient than most in converting schooling into income. Japan’s a big oil importer and a big tourist exporter. So it doesn’t outperform for the same reasons as Venezuela or Spain. Japan’s students, however, do well on international tests, indicating a high degree of proficiency in the classroom. Educational quality, as opposed to years in school, appears to be another key factor in generating GDP.

Educational quality could be a factor in why the United States lies below the green line. Data aren’t available to compare test scores for all 108 nations in Exhibit 3. High school science and
AMERICAN STUDENTS LOSE GROUND . . .

On international math and science tests, U.S. students’ relative performance deteriorates as they move from the fourth to eighth to 12th grade. By the end of high school, they’ve fallen to near the bottom in educational achievement.

. . . DESPITE HEFTY OUTLAYS FOR SCHOOLING

America ranks near the top in spending per student on secondary education, but its 15-year-olds lag in math, science and reading. The solid line shows the positive relationship between spending and test scores. The United States and the other countries below it are underperforming.

TEACHING GETS LESS OF THE MONEY

Over time, a smaller portion of America’s education budget has been going to teaching and a larger share to administration. Recent measures show teaching’s slice of the pie shrinking to an all-time low of 52 percent, the result of a steady decline that began in 1970.
math scores only exist for about 20, mostly OECD countries. These data indicate that raising U.S. test scores to the OECD average could increase America's per capita GDP $4,600 to $5,200 a year. Improving educational quality would produce big gains for the United States.

Americans are keenly aware of their schools' shortcomings. Education has been a front-burner issue since at least 1983, when the National Commission on Excellence in Education released the galvanizing A Nation at Risk: The Imperative for Educational Reform.

The national debate on education has sparked reforms from Washington all the way down to the local level. Initiatives include computer-equipped classrooms, back-to-basics instruction and rigorous standardized testing.

We've tried more money and more teachers. In elementary and secondary schools, per student spending has risen in real terms from $4,616 in 1980 to $8,416 in 2002. The ratio of pupils to teachers fell from 27 in 1955 to 18.6 in 1980 to 16.1 in 2002. Still, American schools aren't what they should be—except at the college level.

The United States distinguishes itself in higher education. On the London Times' 2004 ranking of the world's 200 best institutions of higher learning, the United States took 62 spots, including the top four and seven of the top 10. Runner-up Britain trailed with 30 schools.

At the college level, students are free to deliver a verdict on quality with their feet. America's colleges and universities enrolled 586,000 foreign students in 2003, more than second-place Britain and third-place Germany combined.

The quality of American higher education contrasts sharply with our declining performance in elementary and secondary schools. An important reason is competition. College students are mobile, and for more than a century both public and private institutions have competed for students without regard to where they live.

There's little competition in elementary and secondary education, where public schools dominate. Students aren't free to choose among education producers—unless their families can afford to move to districts with better schools or spend thousands of dollars for private schools. And many parents do make these sacrifices, indicating the high value Americans place on education.

Some economists advocate injecting competition and consumer choice into education, an approach Nobel laureate Milton Friedman champions in Capitalism and Freedom (1962) and Free to Choose (1980).

Friedman's idea of applying market principles to education has won adherents over the decades, particularly among free enterprise economists. They argue that stripping public schools of their monopoly power would spur quality and encourage innovation, just as it does in the private sector. Society could still support education with public funding, but parents would have an opportunity to shop around for what's best for their children. They'd shun bad schools; they'd favor good ones. Average quality would rise as better schools expanded to meet demand and worse ones improved or withered away.

Pilot programs featuring competition among schools have shown generally positive results in Milwaukee, Cleveland, New York, Dayton and other cities. But the idea remains for the most part untested on a large scale. Many educators are skeptical of the Friedman approach, saying schools aren't the same as cars, TVs and other consumer goods. Government mandates, economic inequality, community instability and other issues complicate the act of "buying" education.

Even supporters concede that market discipline isn't a magic bullet. Competition isn't effective without information. Markets work best when consumers receive timely, accurate data on product, performance and price. Even with good information, schools can't compete in a straitjacket. Society can set broad standards, but schools can best adapt to students' needs when they're as free as possible from ponderous regulations.

Many Americans are working to improve our schools, but formal education by itself won't deliver the workforce we need for a knowledge-based economy. More Americans need to develop a habit of learning every day.

We're not there yet, even though many Americans are actively pursuing knowledge on the job. We could do more at work. Once off, we're enjoying one of the true blessings of American capitalism—more leisure. Those of us who strive to get ahead can use some of that time to better prepare ourselves for an age of global competition and knowledge-based jobs.

Many of us aren't doing that. The typical American aged 25 to 34 spends two hours, 20 minutes a day watching TV but just 17 minutes on educational activities. The learning effort drops off sharply as we grow older.

The United States offers plenty of ways to learn—at work and on our own. But many Americans aren't taking full advantage of them.
Success Stories: Lives Shaped by Lifetime Learning

ANA ‘CHA’ GUZMAN
President, Palo Alto College, San Antonio

A 13-year-old girl fled Cuba with her family in 1960—not knowing where she’d end up, not speaking English. She was scared. “My father told me not to worry,” Ana Guzman says. “Fidel Castro can take our jobs, our houses and our industry; he said, ‘but he can’t take my education. We will survive in America.’” After that experience, learning became a big part of Guzman’s life. The family settled in Milwaukee, and Guzman graduated from Stout State University in 1968. Married by then, she relocated to Texas. While teaching in a University of Houston program for low-income Hispanics, Guzman met her role models—married women with children who had earned doctorates. She followed in their footsteps, earning her own doctorate in 1979. She became president of 8,000-student Palo Alto, a two-year college, in 2001. “Without that doctorate,” she says, “there’s no possibility for a leadership position at colleges and universities.”

PRICE PRITCHETT
Chairman and CEO, Pritchett LP, Dallas

Boyhood chores on a tractor, baked by the West Texas summer sun, convinced Price Pritchett that farming wasn’t the life for him. “When I wasn’t in school,” he says, “I had to work my butt off on the farm.” In the classroom, Pritchett developed a love of learning and it took him all the way to a Ph.D. in psychology from Texas Tech University. After a stint in the Army, Pritchett’s doctorate helped him land a job with a management consultant. He had a lot to learn. “My first years on the job were like getting an M.B.A.,” he says. In time, Pritchett found his niche, helping executives manage their companies through the wrenching changes wrought by mergers and acquisitions. His boutique firm employs 20 people. His secret to success: “We need to keep stretching ourselves and learning.”

MICHAEL MARIN
Partner, Vinson & Elkins LLP, Austin

It’s a long way from Canutillo, Texas, to Harvard Law School. Michael Marin made the journey. He grew up in the working-class community just outside El Paso, the son of a Mexican immigrant mother with a second-grade education and Mexican-American father who finished eighth grade. “My parents wanted better for me,” Marin says, “and it was clear that education was the ticket to a better life.” The product of public schools, Marin attended the Air Force Academy for three years, then finished his undergraduate studies at the University of Texas at El Paso. After a stint in the Air Force, he headed to Harvard. The Ivy League school opened the door to the prestigious Vinson & Elkins law firm, where he’s made partner, and the presidency of the Austin Bar Association. Not bad for a kid from Canutillo.
**TOM TINGLE**
Storyteller, Canyon Lake, Texas

You learn storytelling on your own. And Tim Tingle did. A Choctaw, he grew up on Texas’ Gulf Coast and graduated from the University of Texas in 1974. After driving a milk truck, working for a dance company and managing fast-food restaurants, Tingle founded New Canaan Farms, selling exotic jams, jellies and dips. The company’s marketing campaign involved spinning yarns about the farmers who made the products. Tingle loved it. He honed his storytelling skills with Toastmasters events, relating the Trail of Tears tragedy and other aspects of his Choctaw heritage. Tingle had found his calling. He sold the food company and became a storyteller, making his living performing at festivals while selling books and tapes. He earned a master’s in Native American studies in 2003. “The key is finding something you love to do,” he says. “You can’t distinguish between work and play.”

**JOY WALLACE**
President and CEO, J.O.Y. Foods Inc., Dallas

A long and winding road through a succession of corporate jobs led Joy Wallace to a company of her own. After graduating from the University of Chicago, Wallace did financial analysis for Xerox, Rockwell International and Mary Kay Cosmetics. She shifted to strategic planning for Uncle Ben’s rice, went into sales and marketing for an El Paso meat company and took on the school lunch market for Pilgrim’s Pride. Pizza Hut recruited her to run its nontraditional business, and she developed a ready-to-prepare pizza kit for schools. A 1998 licensing deal for the Pizza Pack gave Wallace her start as an entrepreneur. J.O.Y. Foods has now moved beyond the school market with its own pizza line, called Sprazzo. It’s sold to the U.S. military and other food service segments. “Every job I had taught me something I can use in my business,” Wallace says.

**RON WHITE**
Founder, Ron White Training, Dallas

Booted out of college with a dismal grade-point average, Ron White makes his living showing off his mental prowess. He operates Ron White Training, which teaches techniques to improve memory through corporate seminars and the “Memory in a Month” compact-disc course. White’s presentation includes amazing mental feats—such as reciting back a long string of random numbers shouted out by his audience. White stumbled into the memory business by getting into telemarketing after flunking out of college. A natural salesman, he did well. One of his clients sold memory aids. He took the course and used what he learned to create his own business. “If you understand capitalism, you don’t need a degree to succeed,” White says. “If you don’t, you won’t learn it in college. A lot of it is passion, drive, a work ethic and a good idea.”
Americans want jobs that pay well, with generous benefits and good working conditions. When workers aren’t satisfied, the blame often falls on employers, who get slammed for downsizing, outsourcing and paying low wages.

Good jobs aren’t a matter of good intentions. In an era of globalization, geographic and political boundaries are not economic boundaries. Workers compete in a worldwide talent pool, and they will earn according to what they can produce. Economies rich in sophisticated technology and well-trained workers foster high-wage industries. Those lagging in technology and skills are left with lesser jobs.

More than ever, the quality of the labor force determines the quality of jobs. The U.S. economy can only create good jobs if it can supply the qualified workers to fill them.

The payoff for knowledge in the United States has been on the up-swing, giving Americans more reason than ever to learn. As individuals, we’ve got plenty of opportunities to improve ourselves in a nation well endowed with ways to gain knowledge.

The United States already has a highly educated workforce, but we can do better. A wide range of reforms could help U.S. schools close the educational gap with other countries, particularly for secondary school students. They might also help reach at-risk students who for whatever reason don’t or can’t take advantage of the educational opportunities available.

An education system facing all kinds of stresses can only do so much. The responsibility for becoming smarter workers falls just as much on us as individuals. Our attitudes and actions matter.

Remember Jack and Jill? He’s never recognized the value of knowledge, so he’s been disappointed in work. She developed a strong commitment to lifetime learning, and our free enterprise economy has rewarded her for it.

Lifetime learning expands opportunities for all Americans. Unlike the physical capital that belongs largely to the rich, intellectual capital is available to everyone with enough ambition to strive for it. Where we start in life doesn’t have to determine where we wind up. And coming from nothing doesn’t have to mean being stuck there.

The most important tool we have to achieve the American Dream isn’t the computer, the Internet or any of the other innovations sure to dazzle us in the future. It is the brain—weighing, on average, just 3 pounds. America will create more good jobs as students and workers build proficiency with this 3-pound tool. Its development through lifetime learning is the key to opportunity, upward mobility and rising living standards.

—W. Michael Cox and Richard Alm
Acknowledgments

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Notes


3 Price Pritchett, chairman and CEO of Pritchett LP in Dallas, coined the term 3-pound tool to describe the brain.

Exhibit Notes and Data Sources

All dollar amounts in text and exhibits are in 2004 U.S. dollars; international data are adjusted for purchasing power.

Exhibit 1

Exhibit 2

Exhibit 3
The vertical axis scale is logarithmic to the base 2. Estimating the relationship between per capita GDP, years of schooling and economic freedom (which ranges from 1 to 5, with 1 being freest) gives the result $\log_{2}\text{GDP} = 13.92 + .30 \cdot \text{SCHOOLING} - 1.10 \cdot \text{FREEDOM}$, with the t values on SCHOOLING and FREEDOM being 9.63 and -9.18, respectively, and $R^2 = .79$. Each of the solid lines represents the per capita GDP levels predicted within that peer group—from the freest countries (in green) to least free (in orange)—holding the economic freedom index constant at the median within-peer-group values of 2.00, 2.95 and 3.74, respectively.


Exhibit 4
Census Bureau, CPS, historical table A-1.

Exhibit 5

“…Despite Hefty Outlays for Schooling” Estimating the relationship between the average of math, science and reading scores for 15-year-olds and per student expenditures gives $\text{SCORES} = 443 + .01 \cdot \text{EXPENDITURES}$, with the coefficient t values of 26.04 and 3.36, respectively, and $R^2 = .29$.


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The picture on page 15 was taken at a Mi Escuelita Preschool in Dallas.
About the Dallas Fed

The Federal Reserve Bank of Dallas is one of 12 regional Federal Reserve Banks in the United States. Together with the Board of Governors in Washington, D.C., these organizations form the Federal Reserve System and function as the nation’s central bank. The System’s basic purpose is to provide a flow of money and credit that will foster orderly economic growth and a stable dollar. In addition, Federal Reserve Banks supervise banks and bank holding companies and provide certain financial services to the banking industry, the federal government and the public.

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