

The Competition that Really Matters

Comparing U.S., Chinese, and Indian
Investments in the Next-Generation Workforce



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Comparing U.S., Chinese, and Indian
Investments in the Next-Generation Workforce

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Center for American Progress



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GENERATION



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Foreword

The greatness of America is exemplified by the march of generations. The next, by any measure, has always surpassed the previous, thanks to a sacred promise we have kept since our founding, that our generation will invest in America to create a better life for the next generation. We will ensure that America's children will always enjoy a better life than their parents.

That promise—and its benefit to our country—is now less certain.

As we know all too well, the politics of our times, the economies of our world, and competition from other nations are all threatening America's ascendance, a trajectory sustained by superior knowledge, innovation, and family stability. Other countries, through grit, determination, and dire necessity, are making the political commitments and financial investments to improve and modernize their own societies.

The best of them are catching up to us. This is not all bad. Increased educational and family investments made by our rising competitors, China and India, are lifting hundreds of millions of people out of poverty, increasing the human capital available to solve global problems, and creating new markets for the United States. But if the United States is going to stay

competitive, we must make a renewed effort to support our most valuable asset—the next generation of leaders and workers equipped with the skills and knowledge to keep America in her accustomed position of prominence.

This report is a roadmap. As a collaborative effort of the Center for American Progress and The Center for the Next Generation, it examines where the United States is today and how that compares with two of our fiercest competitors for the jobs and thought leadership of the future, China and India.

This report shows that their governments have embarked on ambitious and extensive strategies to lift more of their citizens out of poverty and illiteracy into the middle and upper reaches of society. It shows they have done so by expanding government support for families and making major investments in early childhood learning, expanded primary and secondary school public education systems, and post-secondary degree programs that produce candidates for the best jobs of the years ahead.

These pursuits in and of themselves are not ominous for the United States. Indeed, throughout history America secured its path to economic leadership by undertaking many of the same efforts as a nation. But the developments in

China and India demand our attention for the sheer size of their populations and economies. China has 1.35 billion people, more than any other nation. India has 1.2 billion, to rank second. Simple math suggests that their new initiatives and financial investment can unleash far more qualified young people into the global marketplace than the United States can, ranking third with “only” 313 million people.

The uplifting forces of global economic integration have benefitted the world unquestioningly. But at the same time, we are seeing how the economic restructuring wrought by integration is co-evolving with rapidly increasing inequality among virtually all countries on Earth. Technologies that can bring our societies closer together also have the power to tear us apart. And the inequalities that are so corrosive not only to our democracy, but also, as this report shows, to our economy today and for the nation’s economic future.

This report is a window into a future when old and current rules will no longer apply. The race for intellectual and innovative superiority will be won by the best and the brightest—no matter where they come from—and now, the talent pool is growing bigger than ever.

Americans today face a choice about which future we will choose for the next generation: one in which our society grinds apart through a persistent disconnectedness between preparing young people for their future and jobs that

will demand the best and brightest, or one that reflects a promise kept to revitalize the fundamental sources of America’s economic strength and competitiveness.

Without U.S.-style political constraints, authoritarian China, and to a much lesser extent, India’s parliamentary system of government in tandem with its five-year planning process, have the ability to enact whatever policies they want and spend whatever amounts they deem prudent. The report also looks at several Western nations, to highlight some of their recent efforts in education and family policy to increase their own global competitiveness. Finally, this report takes the changing world landscape into account to offer recommendations for how we can keep the United States strong, healthy, and competitive in the face of this looming challenge from beyond our shores.

Americans have never shrunk from challenge or responsibility. We have always committed to ourselves and to our children, the next generation, to take on anything that makes us stronger. This report tells us another moment is at hand.

We believe we’re up to the task.

— Matt James, *President and CEO,*
The Center for the Next Generation
— Neera Tanden, *President,*
Center for American Progress

Introduction and summary

The U.S. economy is weakening relative to our global competitors. Recent economic growth is 40 percent below any other growth period since World War II as other economies around the globe draw in more investment, both foreign and domestic. In contrast, despite still being the world's leading recipient of direct foreign investment, business investment overall in the United States between 2001 and 2007 was the slowest in U.S. history.

Meanwhile, competition is on the rise. From 1980 to 2011 China increased its share of world economic output from 2 percent to 14 percent. And India more than doubled its output during that period, from 2.5 percent of global production to 5.7 percent. The U.S. share of the world economy fell to 19 percent from 25 percent.

While increasing global competition is inevitable, lackluster U.S. performance need not be. Indeed, rising growth and incomes in other countries present potential new opportunities and markets for American workers and companies. But if the United States means to continue to lead the world and to share our prosperity with it, U.S. policymakers must deploy an American strategy that is responsive to modern economic challenges—a strategy that makes it possible for every American family to ensure

that children entering adulthood are prepared to find a successful place in the global economy.

What should the strategy be? Economists of all stripes point to a robust pipeline of skilled workers as the essential ingredient of a strong and growing economy. Indeed, the two countries most rapidly gaining on the United States in terms of economic competitiveness—China and India—have ambitious national strategies of investing and promoting improved educational outcomes for children to strengthen their positions as contenders in the global economy.

The good news is that the successful history of the American middle class since World War II offers crucial insights for how to grow the world's best-skilled, most innovative, and most dynamic workforce. Those insights, combined with best practices being employed in other developed economies, offer the parameters for a winning American economic strategy.

That's what this report attempts to do. It takes stock of our own nation's human capital challenges, explores the competitive strategies underway in India and China, then uses a comprehensive review of the economic literature to create a broad set of principles for U.S. lawmakers and policy experts to tackle the

greatest economic challenge in a generation: How to ensure that all American children have the opportunity to become high-skilled workers prepared to compete in a global economy.

This is obviously a sweeping and complex topic, which we document in detail in the main pages of this report. But here is a brief summary of the report's findings and recommendations.

The U.S. competitiveness problem and the case for investing in children

Competition from rapidly growing countries such as China and India are changing business norms and the links between national economies. We are quite familiar with what economists call “global labor arbitrage,” the substitution of high-wage workers in advanced economy countries with low-wage workers in developing economies. That’s led to a global re-ordering of production, jobs, and growth.

More recently, technological advances in telecommunications and transportation, as well as skills development in the developing world, are dragging more U.S. industries—including computer programming, high-tech manufacturing, and service sectors—into international competition. This development is feeding a mounting demand for high-skilled labor around the world.

To position the United States for the future, substantial investments are needed in research, infrastructure, and education. The most important of these areas to address is education. Why? Because as this report shows, the overwhelming economic evidence points to

education—and human capital investments, generally—as the key drivers of economic competitiveness in the long term.

Harvard University economist Gregory Mankiw, for example, has shown that in advanced countries such as the United States, human capital investment had three times the positive effect on economic growth as did physical investment. And educational investment is particularly important in early childhood development and learning, according to growth economists. The return on investment from interventions such as prenatal care and early childhood programs is higher than for virtually any class of financial assets over time, according to Nobel Prize winning economist James Heckman.

The academic literature also shows that failing to provide broad opportunities for nurturing, learning, and productive development harms economic growth and national competitiveness.

Having established the primacy in human capital investments as the key to U.S. long-

term economic competitiveness, it's important for policymakers and the public to understand how American children are faring today, and where they need to catch up.

The state of U.S. children from a global competitiveness perspective

It may seem counterintuitive to hold up Chinese and Indian children as a challenge to U.S. competitiveness, as this report does. After all, the United States is the world's wealthiest nation, one that invests more in education, provides more access to quality health care, and enjoys far less inequality than either of the Asian giants.

Indeed, the state of America's children has improved dramatically in the last century. We have fewer kids living in poverty, more children have access to health care, and more are graduating from high school and college. Our national determination to promote the American Dream—a society that promotes equal opportunity and chances for success—has led to unparalleled investment in public health, safety, and educational infrastructure for children. These investments for generations have fueled the engine of U.S. economic growth.

But U.S. gains have begun to stagnate in recent years, even before the Great Recession of 2007-2009, and educational attainment and achievement gaps that track income and race groups have become more entrenched—and more worrisome. These gaps do not

portend well for future U.S. competitiveness because groups with disproportionately lower education achievement and poorer health—including African Americans and Hispanics—will soon comprise a majority of American children. The family structure that was once the foundation of a child's education is crumbling, with more children raised in single-family homes. Meanwhile, our workplace policies are ossified and inflexible, making it difficult for modern parents to be with their children when their children need them most.

“ U.S. gains have begun to stagnate in recent years and educational attainment and achievement gaps that track income and race have become more entrenched.

This report describes in detail the progress and lack of progress in U.S. child development across the areas economists and experts believe are the best indicators of human capital development: education, health, family income and childhood poverty, and pro-family workplace policies. Here is a small sampling of the data to underscore the challenge:

- Half of U.S. children get no early childhood education, and we have no national strategy to increase enrollment.

- More than a quarter of U.S. children have a chronic health condition, such as obesity or asthma, threatening their capacity to learn.
- More than 22 percent of U.S. children lived in poverty in 2010, up from about 17 percent in 2007.
- More than half of U.S. post-secondary students drop out without receiving a degree.
- Only 11 percent of workers have paid family leave, making it increasingly difficult for dual-earner and single-family households to properly care for children.

American children coming of age today will work in a global, technologically advanced economy, competing with peers in India,

China, and other countries around the world. Their ability to compete for high-skill and high-paid jobs is a direct function of our willingness to adopt policies that will boost child education and health, reduce child poverty, and increase parental support and care for their children. That's what policymakers in China and India are doing, as this report's two main case studies show. Both countries are rapidly increasing their share of children enrolled at all levels of the education system—from early learning programs to high schools to universities. These investments have propelled the countries to the top two in the world by number of children educated.

The rise of China's skilled labor force

In the late 1970s, leaders of post-Cultural Revolution China made a renewed commitment to education as the core of its economic revitalization strategy. China's economic boom since 1978 and its increasing human capital investment developed hand-in-hand. Consider: In 1978 China spent less than \$2 billion on education, health, and other social investments. By 2006 that number was \$117 billion, a 58-fold increase.

Today, public commitment to early childhood, educational, and technological development in China is accepted as an integral part of a national economic strategy, unlike in the United States.

In 2007 China surpassed the United States in the numbers of college graduates focusing on science, math, engineering, and technology fields. Three years later, it became the world's largest provider of higher education.

By 2030, China will have 200 million college graduates—more than the entire U.S. workforce. Chinese national goals are ambitious and inspiring. By 2020 China plans to:

- Enroll 40 million children in preschool, a 50 percent increase from today
- Provide 70 percent of children in China with three years of preschool

- Graduate 95 percent of Chinese youths through nine years of compulsory education (that's 165 million students, more than the U.S. labor force)
- Ensure that no child drops out of school for financial reasons
- More than double enrollment in higher education
- Double the share of the working-age population that completes higher education to 195 million workers.

To achieve these goals, China is deploying a coordinated set of strategies that directly track the policy levers economists and experts have identified as critical to boosting human capital and economic competitiveness. Specifically:

- **Families and early childhood education.** The 1988 “Act of Protecting Female Staff and Workers” gave women, employed by public enterprises, a minimum of 90 days paid maternity leave, and covered related medical costs, which was increased to 98 days in 2011. The 2010 “National Plan for Medium and Long Term Education Reform and Development” established a target of near universal coverage for one year of kindergarten over the following decade.
- **Kindergarten-through-12th grade education.** Chinese children compete in a global economy. Foreign language classes, often English, are often begun in the third grade

and studied through middle school. The government's goal is for 90 percent of eligible students to be enrolled in high school by 2020, up from 80 percent today.

- **Higher education.** In 2010 China became the world's largest provider of higher education—and will grant degrees to more than 200 million people over the next two decades. It's improving its state-run universities accordingly. Today, China ranks sixth in the world among countries with the most universities ranked in the world's top 500 universities.
- **Teacher quality.** China is improving the quality of its teachers, even as their numbers explode. The number of teachers with bachelor's degree has increased 66 percent in just eight years, with almost two-thirds of primary school teachers with a higher degree. There are nearly 6 million secondary school teachers in China, up from about 3 million in 1980. And the number of university-level teachers has grown to nearly 1 million from 250,000.

To be sure, China faces massive challenges, including rising inequality and inferior educational quality and access to schools in rural and migrant populations. But despite these obstacles, China's momentum and its education-focused economic strategy will make the country increasingly competitive in sophisticated industries—precisely those where U.S. workers now lead the competition.

The rise of India's skilled labor force

In 1947 more than 80 percent of Indians were illiterate. Today, only a quarter are. Poverty in the country plummeted by 30 percent from 1981 to 2005. By 2017 India will graduate 20 million people from high school—or five times as many as in the United States.

As in China, this dramatic turnaround has been shaped by a national economic strategy focused on education. India's public investment in education grew from \$11 billion a year in the late 1980s to \$44 billion in 2008. And as in China, India's national policies to increase the skills of its young workforce are reaping dividends. The country is already producing more students with bachelor's degrees than is the United States. Over the last seven years, India has tripled its output of four-year degrees in engineering, computer science, and information technology.

To be sure, life for most children in India remains hard, with the World Bank estimating that 40 percent of Indian families live on \$1.25 a day or less. But their lot is improving as India executes its national education strategy, which includes:

- **Family and early education.** India's Integrated Child Development System is boosting the life chances of India's 160 million children under six years old. This educational system proposes to boost the number of children who enter school ready to learn from 26 percent to 60 percent by 2018. The pre-school education system, while in need of much more structure and upgrades, reaches an estimated 38 million children under six. By comparison, in the United States publicly supported pre-school education reaches about 3.5 million children ages 3 to 5 years old.
- **Grades 1 through 5.** India's effort to ensure universal primary school enrollment is the world's most ambitious elementary school enrollment effort. The federal government has paid for the construction of more than 400,000 elementary school buildings; trained and hired 1.5 million teachers; and in an effort to get children to school, established a school lunch program that can feed over 100 million children a day. As a result seven times more children attend primary school in India than in the United States.
- **Grades 6 through 12.** Only a third of India's students today enroll in high school, compared with slightly more than 90 percent in the United States. But investments in lower grades are boosting high school attendance. The percent of Indian students finishing high school will rise from 33 percent today to approximately 47 percent by 2017, according to World Bank estimates.
- **Higher education.** The government's goal of enrolling 40 million Indians in college by 2020

will require spots for 26 million more college-bound students. India already confers more bachelor's degrees than the United States, and by 2020 will be conferring 8 million a year, compared with around 2 million here.

Even if India only applies a modestly more intensive effort to increase educational access,

it will produce twice the number of college graduates than the United States is able to produce annually. That's a trend that will deliver great benefits to this rising economic powerhouse, as its labor force grows by a third over the next two decades (compared with just 1 percent expected growth on the U.S. labor force by 2030).

Insights and best practices for the United States

So what are U.S. policymakers to do with this information, other than worry? The first step is to identify the ingredients for America's strategic investment in our next generation workforce, mined with insights from America's successful middle-class and high-income families. We should also look at the "best practices" of systematic next-generation investments in European countries more similar to ours.

Lessons from the U.S. middle class

It's no surprise that U.S. children from high-income and middle-class families are outperforming those from low-income families across a range of outcomes. Socioeconomic class is the best indicator of future success because of the advantages wealthier parents can provide. High-income and middle-class youth graduate from high school and college at higher rates, and are more likely to be gainfully employed at age 25. They have higher earnings on average,

and a higher probability of having jobs with employer-sponsored health care benefits.

The evidence also points to a series of behaviors and actions taken by parents and youths associated with these successes—actions that are more prevalent as one moves up the income scale. The 1997 National Longitudinal Survey of Youth, a U.S. government survey of men and women born from 1980 to 1984, can help us understand what "inputs" are associated with successful education and development of these American children, who were ages 12 to 17 when first interviewed:

- **Early childhood learning and education.** Children receiving child care were more likely to graduate from college and obtain better jobs when entering the workforce, the survey showed. Children who attended pre-kindergarten child care also were more likely to be employed at age 25.

- **Parental involvement in educational development.** Children whose parents were classroom volunteers and created enriching home environments were more likely to score well on aptitude tests, get a college degree, find work, and earn more money.
- **Teenage work experience.** Programs such as job-shadowing, apprenticeships, and internships are strongly associated with better educational and work outcomes, even when accounting for differences in parental household income.

These data point to a set of middle-class norms that are highly associated with ensuring that stronger percentages of these children entered adulthood with a college degree and were able to command a stronger wage than their lower-income counterparts. The educational and work related-norms of middle-class parenthood, and the quality of the schools educating these children, account for much of their success.

Having mined the American middle class for particular “inputs” of success, a clearer picture emerges of what a coherent U.S. next-generation workforce strategy might look like. But policymakers seeking to turn goals into specific policy interventions can learn useful lessons from what our counterparts in the developed world are doing to remain competitive with emerging economies such as China and India.

Best practices in European countries

As in China and India, major European countries are making significant investments in children and families while simultaneously reforming their education systems. Many of these successful strategies offer readymade “best practices” that can be replicated or modified to address our own challenges.

In general, large European countries have lower poverty rates than those of the United States, thanks to more generous social and pro-family policies including paid maternity and paternity leave, paid child care and other government-directed cash payments, and tax breaks for families with children. European students on average score higher on math, science, and reading tests than their American peers.

While India and China are in a rapid “catch-up” period of growth, the developed economies of the United States and Europe must grow through innovation or related strategies that tap existing resources more effectively. Among the specific European best practices explored in this report:

- **Teacher quality.** Finland has a remarkable teacher-quality strategy designed to get its top students to become teachers and to transform teaching into a highly selective, prestigious, and rewarding profession. A few

decades after the reforms began, Finland's high school and college graduation rates have shot up, boosting the country's leading growth rate and helping it diversify its economy into information technology and research sectors.

- **National education standards and strong workforce apprenticeships.** Germany's federalization of education standards came in response to poor international test scores in 2000. Germany has since become the most improved country in math achievement, and the average student improved by 10 percent. By 2009, 17 percent of German students were competent at advanced math, compared with just 10 percent of U.S. students. We also profile Germany's "dual education" system,

which places a priority on links to workplace experience, and funnels 2 million students into three years of apprenticeship training in 400 occupations.

- **Investments in early childhood education and family supports.** The United Kingdom's universal free preschool, combined with one of the most innovative family support models in the world, have led to integrated family services and early intervention in community-based "children's centers." Begun in the late 1990s, studies show these investments in early childhood and pro-family services have improved child social behavior, boosted learning skills, and promoted home settings more conducive to learning.

Recommendations

Despite the varied nature of their efforts to prepare more young people for success in an increasingly competitive global marketplace, China, India, and several European countries are dramatically improving educational outcomes of their students. What they have in common is a new aggressive determination to:

- Set realistic, yet ambitious national education goals to prepare students for college and for the careers of tomorrow
- Improve teacher quality
- Invest in early learning and increase parental involvement

The problems in the United States, however, are not due to a lack of understanding of how to improve and focus our school system. The problems are related to the political will to do it. The times of excitement and commitment to change have waned since the first National Education Summit in 1989 hosted by President George H.W. Bush and attended by all the nation's governors. This groundbreaking presidential summit with governors set in motion a more active federal role in education and numerous joint efforts by governors to boost student outcomes.

While the governors have continued to push for reforms and some have increased investments, the state-by-state approach to progress means it is uneven.

Even though, the Obama administration has put in place bold strategies to stimulate more state-level action, we still lack a coherent national policy for boosting student outcomes. Yet there are very promising signs in the United States, among them:

- The commitment to Common Core national education standards by nearly all of the nation's governors
- A bipartisan coming together on improving teacher quality
- A recognition by the states of the critical importance of early childhood learning

But these efforts must be integrated to truly have an impact. Furthermore, they must not be abandoned due to the strain on the national and state budgets.

Accordingly, our report calls upon the president of the United States in 2013 to convene the governors for a National Education Summit to make a renewed effort at improving educational outcomes in the United States—this time through a laser-like focus on improving teacher effectiveness, ensuring that states can move forward with a national early education system, and integrating these efforts into the goals set with the Common Core standards. Only with renewed leadership on education as a national priority and real investments at all levels of government will the United States hope to be able to remain economically competitive.

The U.S. competitiveness problem and the economic case for investing in children

The United States has long been and remains the world's largest economy and a global leader in productivity, innovation, and technology. But our continued standing at the top of the global economic podium is not guaranteed. The global competitive landscape is evolving, and there are alarming signs of a weakening in the foundations of the U.S. economic engine. Meanwhile, other countries are racing to catch up.

To strengthen the economy and get back on the right track, the United States must focus on ways to improve economic competitiveness. Critical to our competitiveness is ensuring America develops a skilled and productive workforce capable of creating, attracting, and competing for jobs in an increasingly globalized labor market.

Economists call the sum of the capabilities of a workforce “human capital.” This form of capital includes the health, education, skills, and talents that allow people to produce, create, and innovate their way to success—for their families and for the nation as a whole. Economic research consistently shows that human capital has, over time, been important

to determining the strength and growth of national economies.¹

Building human capital for a competitive U.S. economy begins with opportunities in early childhood and with parents who can provide their children good health, quality of care, and education. These opportunities must continue through youths' transition to adulthood. Unfortunately, the United States seems to be simultaneously falling behind and headed in the wrong direction across a range of metrics of opportunities for human capital development—and that hurts us all economically.

This is a problem. Public investments in children are the key to improving competitiveness and strengthening the U.S. economy for the long term. If the United States intends to continue its place on the leaders' podium, we need to change our game plan. Our policy should be aimed at giving all children and families the support they need to nurture their kids' skills and intellectual curiosity so they grow up to drive, attract, and create high-value jobs and companies. At stake is the competitiveness of the U.S. economy.

The U.S. economy is weakening and investments in the future are declining

Even before the Great Recession hit the United States at the end of 2007, the U.S. economy was already showing signs of weaknesses that were obscured by speculative bubble-driven growth in real estate and financial products. Even the 2000s bubble economy was not setting any (good) records.

The economic expansion from November 2001 to December 2007 was the weakest in the post-World War II economy in terms of household incomes, employment, business investment, and gross domestic product, the broadest measure of economic size, including all goods and services produced by workers and equipment in the United States.² In these six years, the average income for middle-income households increased by a mere \$45 to \$52,544 in real terms (after accounting for inflation)—primarily because people worked harder and longer hours for flat or decreasing pay. At the same time the United States is losing ground to other countries such as China and India, which are outpacing the United States both in current growth and in making key investments in their economic futures.

Growth

Despite steady annual growth from 2001 to 2007, the overall economic growth rate in

the 2000s expansion ran 40 percent below the average rate for all other growth spurts in the economy since 1949. And much of that growth, as we now know, derived from unhealthy speculative bubbles in real estate and related financial assets. When the bubbles finally popped and the financial crisis ensued, an already weakening U.S. economy fell into its deepest recession since the 1930s.

Business investment

An important indicator of an economy's future productivity and competitiveness is business investment in factories, equipment, and technology.³ In the 2000s, businesses in the United States invested at a slower pace than at any time since the end of World War II. The expansion from late 2001 through 2007 saw the slowest rate of net business investment—new capital investment less depreciation—in the recorded history of the U.S. economy.⁴

The Great Recession and the financial crisis drove business investment even lower. Though the American Reinvestment and Recovery Act of 2009 and other policies helped temporarily revive investment from recession lows, U.S. business investment remains worryingly low with profound potential consequences for the future vitality of our economy.

Employment and income

After the percentage of Americans employed reached a peak of 65 percent during the late 1990s boom, it fell below 62 percent and remained below 63 percent for the remainder of the 2000s expansion. Although this may seem like a small change in the percentage of the population employed, the difference would mean an additional 4.7 million jobs at the end of the business cycle in December 2007. The Great Recession exacerbated the impact on the middle class—a recent study by economists at Duke University found that 95 percent of the job losses in the United States were middle-skill jobs such as officer workers, bank tellers, and machine operators.⁵ A further sign of economic weakening is reflected in stagnant incomes for America's middle-class and low-income families over the past generation, as U.S. income and wealth has concentrated more and more at the very top.

Science and technology

Across a number of indicators of science and technological progress, the United States also shows signs of relative decline. A labor force comprised of technologically skilled workers is a critical for economic growth. U.S. universities are projected to award twice as many

business and social science undergraduate degrees as they are for the so-called STEM subjects (science, technology, engineering, and math), according to a major McKinsey Global Institute study in 2011.⁶

Lagging STEM education spills over into the business world, too. In the private-sector economy, the average annual growth rate of U.S. research and development-related employment fell to 1.1 percent in the pre-recession 2000s from 4.4 percent in the 1980s to 3.1 percent in the 1990s.⁷ One readily observable outcome of the shrinking supply and demand for technological workers is the declining competitiveness of U.S. advanced technology exports. In February 2002, the United States for the first time bought more high-technology goods than it sold to the rest of the world. In the 12 months through February 2012, the value of high-tech imports over exports increased to \$100 billion.

And there are national security implications to our STEM education shortages. U.S. campuses aren't preparing enough mathematicians, engineers, and scientists to fulfill the needs of the military, government, and intelligence agencies or of the aerospace and defense industries, according to a 2012 Council on Foreign Relations report.⁸

Global competition is on the rise

Over the same period of U.S. economic weakening, other countries have strengthened their economic fortunes. China's spectacular growth since embarking on economic and educational reforms in the late 1970s is, by now, well known, as is India's economic performance since reforms began in earnest there in the early 1990s. The scale and scope of their progress remains astounding.

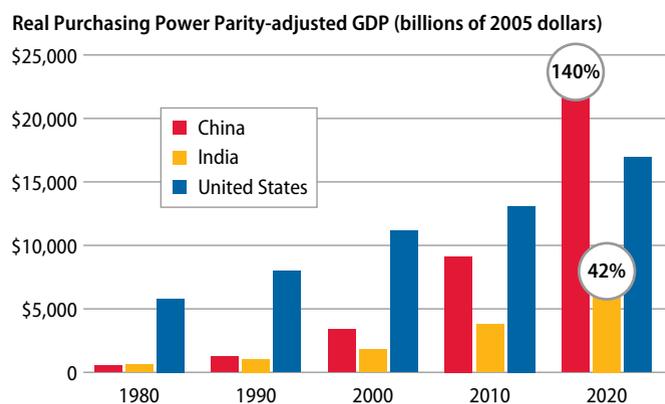
saw a 5.5-fold increase in average living standards. By comparison, in just one-fourth of that time, from 1978 to 2008, China had a 6.9-fold increase in average living standards. Meanwhile, average living standards in India increased 2.3 times from 1991 to 2008.⁹

In 1980 China accounted for a mere 2 percent of world economic activity, and India accounted for 2.5 percent. But by 2011 China was producing more than 14 percent of total world output, and India was producing 5.7 percent. Over the same time, the United States's share of the world economy fell to 19 percent from 25 percent.¹⁰

At their current growth pace, China and India are converging on the U.S. economy. If the United States and China maintain their current growth trends, China's economy will overtake the size of the United States's sometime in 2016 and will be 6 percent larger by 2020. India's economy, while growing slower than China's, is also converging on the United States. In 2010 India's economy was 29 percent as large as the U.S. economy; if current trends hold India's economy will be 42 percent the size of the U.S. economy by 2020.¹¹ (see Figure 1)

FIGURE 1
Catching up

China and India's economies projected to converge on U.S.



Source: Authors' calculations of World Bank World Development Indicators data.

Consider the comparison between the United States amid the industrial revolution and China and India today. From 1820 to 1929, as the industrial revolution and fossil fuels transformed the U.S. economy, Americans

Not a zero-sum game

To be sure, the success of other countries does not necessarily portend failure for the United

States. Economic growth and rising incomes in other countries could mean potential new markets and opportunities for businesses and workers in the United States. Nobel Laureate Michael Spence has referred to this stage of globalization as “the inclusiveness revolution,” and projects that by the middle of this century “perhaps 75 percent or more of the world’s people [will] live in advanced countries.”¹²

What this dramatic shift does mean, however, is that the landscape of the world economy is changing. American workers are increasingly competing with—and sometimes losing out to—workers from elsewhere in the world. And many developing countries that once competed on a basis of low wages and low standards are increasingly learning to compete on the basis of technical skills and innovation. The key question for future economic growth, then, is this: Can the United States better focus its economic policies to compete more effectively in a changing economic order?

The changing nature of economic competitiveness

The rapid growth and competition from developing countries such as China and India are transforming ways of doing business and changing how national economies are linked. One way this competitiveness has played out is through what Morgan Stanley chief economist Stephen Roach describes as “global labor arbitrage,” a process by which companies substitute low-wage workers in developing countries to replace higher-wage workers in advanced

economy countries. Their business investments in countries around the world thanks to these low-skill labor arbitrage opportunities has been a key driver of the global re-ordering of production, jobs, and growth.

Advances in telecommunications and transportation technologies today—combined with the increasing workforce development in countries such as China and India—are drawing more leading U.S. industries into international competition through low-wage labor arbitrage. Alan Blinder, the former Federal Reserve governor and current Princeton University professor, wrote in a 2006 *Foreign Affairs* article:

“Constant improvements in technology and global communications virtually guarantee that the future will bring much more offshoring of “impersonal services”—that is, services that can be delivered electronically over long distances with little or no degradation in quality... We have so far barely seen the tip of the offshoring iceberg, the eventual dimensions of which may be staggering.”¹³

This competition is true not just of certain services described by Blinder, such as call center operators, but also of a growing array of industries in which countries are competing with the United States at higher levels of the global economy’s food chain. In other words, more industries are becoming pieces of the global economy and are ever more mobile, which means the competition to provide goods and services will continue to become increasingly fierce.

In the 1980s and 1990s, this labor arbitrage took place primarily in traded goods industries such as low-tech labor-intensive manufacturing. It's widely acknowledged that increasing trade with low-wage labor countries has contributed to the increased inequality experienced in the United States and elsewhere since the late 1970s.¹⁴

Today, thanks to sustained high investment and successful national economic strategies, more developing countries are starting to compete with the U.S. in increasingly advanced technology endeavors such as computer pro-

gramming and high-tech manufacturing. They are feeding a growing demand for high-skilled labor in both goods-producing industries, like manufacturing, and in the services and knowledge-producing industries, in which the U.S. economy has traditionally led.¹⁵

So what's to be done? This is a complex problem that will require the United States to comprehensively examine our plans for economic growth and job development, but the economic research is clear that one of the main components to addressing this problem is to focus on education through the whole human lifecycle.

The critical role of education to competitiveness

In January 2012, the U.S. Commerce Department published a report on U.S. competitiveness that concluded:

Innovation is the key driver of competitiveness, wage and job growth, and long-term economic growth. Therefore, one way to approach the question of how to improve the competitiveness of the United States is to look to the past and examine the factors that helped unleash the tremendous innovative potential of the private sector.¹⁶

The three pillars that the Commerce Department report identifies as key to competitiveness are federal support for:

- Research
- Infrastructure
- Education

To position the United States for the future, we must make substantial investments in each. Consider, for example, that the United States ranks 8th in research and development spending as a percentage of gross domestic product (behind Israel, Sweden, Japan, and South Korea, among others).¹⁷ As for infrastructure, in 2011 the World Economic Forum, Global Competitiveness report ranked the overall condition of U.S. infrastructure 24th in the world, down from 8th place in 2005.¹⁸

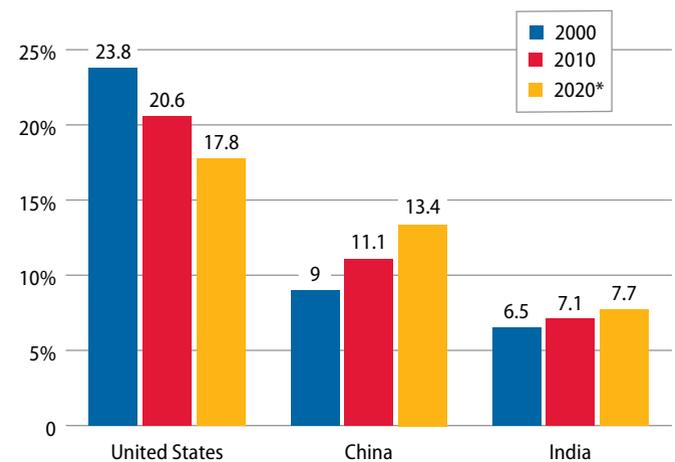
But when it comes to a single critical focal point for U.S. policymakers' attention, without question the most important area to be addressed is the third pillar—education. That's because the overwhelming abundance of economic research consistently points to education and broader human capital investments as the most important drivers of economic progress over time. Systematic investments in their young people by governments, families, and communities are the key driver of international competitiveness. Institutions that fail to provide broad opportunities for nurturing, learning, and productive development impede economic growth and national competitiveness.

Both China and India are closing the gap with the United States on the proportion of the world's college graduates. From 2000 to 2010, the U.S. share of college graduates fell to 21 percent of the world's total from 24 percent, while China's share climbed to 11 percent from 9 percent. India's rose more than half a percentage point to 7 percent.¹⁹ (see Figure 2) Based on current demographic and college enrollment trends, we can project where each country will be by 2020: The U.S. share of the world's college graduates will fall below 18 percent while China's and India's will rise to more than 13 percent and nearly 8 percent respectively. Even though developing countries face numerous educational challenges, the sheer population sizes of China and India mean that relatively soon they will match the United States in the number of skilled-workers competing in globally-mobile industries.

FIGURE 2

Share of world's college graduates

Comparing the United States, China and India, 2000 to 2020



*Projection

Source: Authors' analysis of Barro and Lee (2012) and U.S. Census data.

And the right sort of education flows directly into the innovation that drives competitiveness. From 2000 to 2008, the annual pace of new science, technology, engineering, and mathematics—or STEM—degree awards from four-year colleges in the United States increased by 24 percent, or about 98,000 graduates, to 496,000. Over the same period, China increased its yearly pace of STEM college degree awards by 218 percent, to 1,143,000 graduates from 359,000. A similar pattern can be seen in Chinese graduate education. In 2007 China surpassed the United States in the number of science and engineering doctoral degrees awarded.

India tells a similar story. The number of bachelor-equivalent degrees conferred there in

engineering, computer science, and information technology more than tripled in the last seven years. There were nearly 220,000 such

Indian degrees handed out in 2006, up from about 68,000 in 1999, according to a Duke University study.²⁰

Key policy levers

Human capital's importance for the economy goes well beyond whether a person has the skills to find a good job and the ambition to seek economic opportunities. A society's collection of human capital is worth more than the sum of its individual parts. A 1992 study co-authored by Harvard economics professor Gregory Mankiw demonstrated the importance of human capital investment in explaining variation in economic growth rates across countries and time. The analysis found that human capital investment had a roughly equal or larger effect on economic growth rates than did investment in physical capital—buildings, factories, equipment, and computers.²¹

More interestingly for the United States, Mankiw's results indicated that for advanced countries like the United States, the positive effect of human capital investments on economic growth is three times larger than the effect for physical investment. "Human capital, particularly that attained through education, is crucial to economic progress," argue Harvard economist Robert Barro and Jong-Wha Lee, former chief economist at the Asian Development Bank.²² And, as Barro and Lee note, a large population of well-educated

people makes for higher labor productivity, an economy that can support high-skilled work and industries, and a greater ability to absorb new technologies that improve living standards and boost economic competitiveness.²³

Recent work, extending the extensive analysis of economic growth over the past two decades by economists, identifies achievement in math and science as the key element of human capital. Nations with greater achievement on international assessments of math and science show dramatically higher rates of long run economic growth.²⁴ Improvements in student achievement, something we emphasize below, could markedly improve the economic future of the United States. Thus, a focus on children's achievement is warranted when thinking about the economic development of our nation.

Of course, education is not the only factor driving economic growth. The United States has been able to overcome the relatively low performance of its schools through compensating with other factors. Economic growth also requires quality institutions and governance, which make possible a host of societal

benefits that lead to important public investments, a level and stable economic playing field, appropriate policies of incentives and taxes, a strong middle class, and social protections such as retirement, medical coverage, and income safety nets.²⁵ But the research consistently shows that education is the most important factor. And education, of course, means focusing on the learning and achievement of children.

Human capital development must begin in early childhood

Economists studying the root causes of economic growth increasingly stress that investments in early childhood development and learning are especially critical for the human capital development needed in a strong, competitive economy. That's because prenatal care and experiences from birth through early childhood affect children's physical and brain development—and therefore the cognitive, social, and emotional development that will carry them through their lives.

As a team of World Bank economists recently noted, “Lack of access to nutrition and health care, insufficient stimulating human interaction, and [lack of] pre-primary education are associated with lower educational attainment and achievement.”²⁶ Opportunities for early learning, health, and pro-family policies combine to give young children a head start to becoming productive, competitive adults—with substantial payoffs for the economy overall. The return on investment from such

“ Recent work, extending the extensive analysis of economic growth over the past two decades by economists, identifies achievement in math and science as the key element of human capital.

early human capital investments ranges from 7 percent to 18 percent, economists find.²⁷

That's a higher rate of return than for virtually any class of financial asset over time. As Nobel Prize winning economist James Heckman writes:

“The returns to human capital investments are greatest for the young for two reasons: (a) younger persons have a longer horizon over which to recoup the fruits of their investments and (b) skill begets skill.”²⁸

According to a summary of their work, Heckman and fellow economist Pedro Carneiro find that the reason investments in early childhood development and education packs such a strong economic punch is because “early learning is far more productive and cost-effective than later, remedial education, as the social and behavioral skills that children learn in their early years set a pattern for acquiring positive life skills later in life.”²⁹

Heckman also researched the effects of intensive pre-education pilot programs on low-

income children through adulthood, finding that children who participate in these programs do better in school, are more likely to graduate and attend college, and are more likely to transition to successful adult lives.³⁰ More recent research released in June 2012, examined the longitudinal impact of adults now 28 years old who benefited from high-quality early echoes and reinforces the findings by Heckman.³¹

Research from the National Institutes of Health found that the quality of early child care was the most consistent predictor of young children's behavior.³² And children who receive high-quality child care have better developmental outcomes in early childhood, including better cognitive, language, and communication development.³³ In short, experiences early in life have significant impact on an individual's lifetime possible economic trajectory.

Pro-family policies are also essential to human capital development

Economists have long recognized that pro-family policies—such as paid sick leave and flexible work scheduling—contribute to higher efficiency workplaces.³⁴ More recent research is demonstrating the clear benefits to children's cognitive development when a parent can spend more time with a child in the first year of life.³⁵ Initial research shows that these policies affect human capital development in children, suggesting that pro-family arrangements enabling parents to invest more

time in their children's development in the first year of life will ultimately boost human capital across the whole economy.³⁶

While the involvement of parents is critical, their ability to maximize their children's human capital is often limited by the demands of long and inflexible work schedules, family budget constraints, and the inability to afford housing in communities with high-quality schools.³⁷ This plays out most clearly with low- and middle-income families. Most of these families don't have a full-time, stay-at-home parent. And many parents work nontraditional schedules that do not allow them to be home when children are home from school.

In roughly two-thirds of families with children, mothers are now breadwinners or co-breadwinners, bringing home at least a quarter of the family's earnings.³⁸ Parents at every income level—especially mothers—are working more paid hours away from home. Between 1979 and 2000, annual combined hours of work for families with children increased by 18.4 percent for families in the second-lowest income quintile, by 13 percent for families in the top income quintile, and by 15.8 percent for all families.³⁹ As parents spend more hours at work, they spend less time with their children and less time investing time in their development.

This is especially true of low-income and middle-class working parents. They are less likely to have jobs with a flexible schedule or to have access to job-protected, paid time off

for caregiving. These workers are more likely to struggle with nontraditional work-shifts that do not allow them, for example, to be home in the evening to go over homework,⁴⁰ and with jobs that do not provide paid sick days to care for sick children. The research shows that when parents' can care for sick kids, the children's recovery speeds up.⁴¹

Further, lack of pro-family work policies can mean that youth from low-income families often have less time to devote to their own intellectual development. Low-income youth are more likely to need to work to help support their family or to use their time to care for other family members. That time—not to mention the added life stress it creates—can detract from a child's ability to focus on learning and schooling. Many U.S. children must care for a sibling while a parent is at work, denying them time for their studies. Among families participating in state welfare programs, increased reliance on sibling care has been shown to hurt adolescent schooling outcomes.⁴²

All of this evidence points to the conclusion that most people intuitively understand: Parents have a critical role to play in the development of children. And when jobs don't provide the flexibility and security that enable parents to fulfill this responsibility, then children suffer the consequences. When work impedes parents' abilities to play a greater role in developing their children's' human capital, our national economic competitiveness suffers over the long-term.

Secondary and higher education complete the human capital development chain

While the focus on early childhood for attaining good education outcomes is critical, it is the foundation of skills development—not the endpoint. As Heckman notes, “skill begets skill.”⁴³ Preparing children for success in Kindergarten through 12th grade is the first step in a lifetime of learning. And as industries become more mobile and global, the skills required for Americans to compete effectively are more refined than they were a generation ago.

The seminal report “Help Wanted,” by Georgetown University's Center on Education and the Workforce, pointed out that “in 1970, almost half (46 percent) of high school dropouts were in the middle class. By 2007, the share of dropouts in the middle class had fallen to 33 percent.”⁴⁴ Those who drop out of high school no longer can sustain themselves enough to stay in the middle class. What's more, by 2018, “63 percent of job openings will require workers with at least some college education.”⁴⁵

Not surprisingly, jobs providing middle-class incomes are highly correlated with educational achievement. In testimony before the House Committee on Natural Resources, Center for American Progress Senior Fellow, and now director of Advanced Energy for the Center for the Next Generation, Kate Gordon said even as jobs in the clean economy sector on average pay 13 percent higher than the economy

average, the skill level of workers is not high enough to keep pace with employer demand.⁴⁶

Given the deleterious effects of income inequality on educational and skills achievement—from a young age and continuing through America’s increasingly expensive postsecondary system—devising a strategy to foster lifelong learning is critical to America’s long-term competitiveness and economic success. As scholars from the Hoover Institution of Stanford University emphasized last year⁴⁷

The economic and technological demand for a talented, well-educated, highly skilled population has never been greater. Not only must everyday workers have a set of technical skills surpassing those needed in the past, but a cadre of highly talented professionals trained to the highest level of accomplishment is needed to foster innovation and growth.... our future depends on reaffirming America’s role as the world’s engine of scientific discovery and technological innovation. And that leadership tomorrow depends on how we educate our students today.

Conclusion

The evidence is clear. Global competition is moving higher and higher up the skill and value-added economic food chain. More than ever, our national economic success will depend on our ability to develop a broadly and deeply educated workforce.

Fortunately, there are proven examples of practices, policies, and recent government initiatives

that offer a blueprint for solving many of our competitiveness challenges. Policymakers can learn valuable lessons from the time-tested practices of middle-class and high-income American families as well as from analyzing successful initiatives in other developed countries.

Meanwhile, China and India are sprinting to catch up.

The United States: Stalled in preparing our children to compete

In the minds of most Americans, the United States is far superior to China and India in helping children reach their maximum potential. And for good reason. Still the world's wealthiest nation, the United States invests more in the education, provides greater access to quality health care, and has far less inequity among socioeconomic groups than either China or India.

The U.S. advantage derives, in part, because programs that China and India began in the 1980s to address education, health care, and poverty were efforts that America started tackling on a national level in the 1960s, among them:

- Federal aid to our poorest schools from the Elementary and Secondary Education Act
- Health care for our poorest children through Medicaid
- Racial and gender equality with the passage of key civil rights laws
- Food for hungry children and families through the Food Stamp Act

America kept building on this social compact through the next four decades, open-

ing up schools to children with disabilities through the Individuals with Disabilities Education Act, expanding a commitment to children's health through the Children's Health Insurance Programs, providing income support to low-income working families through the earned income tax credit, offering job-protected family and medical leave to a large swath of the American workforce through the Family and Medical Leave Act, and improving standards-based education.

As a result, we have reduced childhood poverty, increased educational attainment and achievement, and expanded access to quality health care. But the gains have stagnated in recent years (even before the Great Recession fully set in), underscoring gaps in each area between high-, middle-, and low-income children, and between whites and Asians, on the one hand, and blacks and Hispanics, on the other.

These challenges are exacerbated by demographic changes in America's children and families. Blacks and Hispanics, who disproportionately have lower educational attainment

and poorer health, will soon be the majority of children in America. Our family structure, once the foundation for a child's education, is crumbling as more children are raised in

single-parent homes with little to no support. Our workplaces have grown outdated and inflexible, denying parents time to be present when their children need them most.

Education

Focus on America's growing inability to educate our children to compete in the global economy began in earnest with the release of "A Nation at Risk: The Imperative for Education Reform," a report from President Ronald Reagan's National Commission on Excellence in Education. It was a wake-up call to our leaders and the public, leading to the 1989 National Education Summit, the first-ever meeting between a President of the United States (then President George W. Bush) and the nation's governors that focused on how to improve America's educational performance.

The summit led to bipartisan agreement on eight national education goals to be accomplished by 2000.⁴⁸ Their intent was to prepare students to compete in a global economy. So how did the nation do? Let's examine our progress on several of the central goals.

Goal

All children in America will start school ready to learn

While the United States has not met the goal of ensuring that all children are ready to learn

when they start school, access and enrollment in child care and pre-school education has increased significantly since the 1980s—to a current 58 percent of 3-to-5 year olds enrolled in full-day pre-primary programs from 32 percent in 1980.⁴⁹ This is due to many factors, including women's increased participation in the workforce, significant federal investment in child care for low-income families, and a movement among the states to expand access to preschool for 3 and 4 year olds and to move to full-day kindergarten for 5 year olds.

Today, the United States's early childhood education system serves about 8.2 million children ages 3 to 5.⁵⁰

By contrast, China serves 27 million children ages 3 and 4, providing 51 percent of them with at least one-year of preschool, up from 9 percent in 1980. China plans to increase their access to 80 percent of all 3 and 4 year olds by 2020.⁵¹ While India's early education system is not as well-resourced as the system in China, it currently offers about 38 million students some early learning instruction, and the government expects to ensure the first

grade school readiness for approximately 19 million children a year by 2018, that's about 60 percent of all students who enter first grade.⁵²

The relatively wide reach of early childhood education programs in the United States is made possible by a substantial public investment of \$19 billion and by parental spending of an additional \$36 billion.⁵³ The problem is that nearly one-half of the children who most need an early learning boost—those from families with limited incomes and levels of education—are not enrolled in these programs.⁵⁴ And those children in low-income families who do have access to child care too often have access only to the poorest-quality options.

Further, the state-based efforts at expanding universal pre-school are threatened by severe state budget deficits. Total state funding for pre-Kindergarten programs decreased by \$60 million nationwide in 2011, after decreasing by \$30 million the previous year.⁵⁵ So just as China is ramping up its investments in early childhood education, aiming to serve 80 percent of all 3- and 4-year-olds by 2020, the United States is reducing investment in pre-school learning and has set no clear national goals to counter China with a bold plan to increase access and improve quality of early learning in our country.

A shortage of funding is only part of the story. The United States early childhood education system ranks poorly on measures of quality, access, and affordability according to the newly created Starting Well Index. The index, created by the Economist Intelligence Unit, a

research arm of *The Economist*, offers a useful glimpse into how much improvement is needed to meet world class standards. Among the 45 OECD major and emerging nations the United States system ranked 31st for availability of early education, 16th for affordability and 22nd for quality.⁵⁶

Goal

The high school graduation rate will increase to at least 90 percent

The United States has a relatively good track record in ensuring that our high-school students attain their high school diploma or an equivalency, but our country has made no significant progress in this area in decades. The number of young adults ages 25 to 29 with a high school diploma or equivalent in 1990, 85 percent, was the same in 2010.⁵⁷

States and localities, however, continue to aim toward reaching a 90 percent on-time graduation rate.⁵⁸ This goal is critical as students who drop out earn approximately 30 percent less annually in income than those workers with a high school diploma.⁵⁹ High school dropouts also have fewer tangible job skills and are less likely to go on to postsecondary education (even if they ultimately receive their diploma or an equivalency). Nationally, only 76 percent of public high school students graduate on time with a regular diploma, and a significant gap remains in on-time high school completion among Asian (93 percent), white (82 percent), black (64 percent), and Hispanic students (67 percent).⁶⁰

Alarming as these statistics are, the United States has made major strides over the last half century in ensuring that students ultimately get their diplomas or an equivalency by the time they are 24 years old. In 2009, 94 percent of whites, 87 percent of blacks, and 77 percent of Hispanics had received a high school diploma or equivalency by age 24.⁶¹ In 1962 only 42 percent of blacks and 69 percent of whites ever completed high school or an equivalency degree.⁶²

The good news is that our education system still compares favorably to China and India. They graduate only 65 percent and 25 percent of their students from high school, respectively. And both countries are well behind the United States in the percentage of students enrolling in colleges or universities—as China enrolls about 24 percent and India enrolls about 11 percent, compared to a 70 percent enrollment in the United States (see chapters 3 and 4).

The bad news is that our impressive high school graduation and college enrollment statistics obscure the fact that only half of those who enroll in college actually graduate within six years. What's more, the education-skills gap seems to be widening such that our students are not prepared for the high-skill jobs of the knowledge-based global economy.⁶³

Indeed, the latest 8th grade U.S. student assessment results show that 6 out of every 10 students can't competently perform grade-level math, science, or reading skills. And 8 out of 10 low-income 8th graders fail at grade-level tasks.

Goals

All students will leave grades 4, 8, and 12 having demonstrated competency over challenging subject matter

The United States will be the first in the world in mathematics and science achievement

The academic achievement of U.S. elementary and secondary school students who remain in school or ultimately receive a high school diploma suggests that they are not learning enough to be competitive in a global economy. Student performance on the Program for International Student Assessment, or PISA, the benchmark measure for progress, tells an interesting story about the students we are educating well, where we are failing certain students, and where we are failing all of our students as a nation. It's not possible to benchmark U.S. student performance against the students in our rising competitor nations, China or India. Neither country yet participates in PISA on a national scale. Yet U.S. performance on the PISA demonstrates that we face significant challenges with ensuring all students are graduating with the skills needed to ensure the U.S. competitive position.

In reading literacy—our best area of performance—our 15-year-olds performed, on average, better than those from other developed and advanced developing member nations of the Organization for Economic Co-operation and Development on the latest PISA from 2009, but we still rank 14th out of the 34 OECD countries taking the test. Yet this average masks some deep differences.

The United States would score *first* in the world in *reading* if only students attending the richest schools in the country took the test, and *third* if only white American students took the test. But students in schools with the highest concentration of poor students, as well as black and Hispanic students in the United States, earn scores closer to those of their Mexican peers than the U.S. average.⁶⁴ Mexico ranked dead last among the OECD countries taking the exam.

In math literacy, the United States ranks 25th among OECD countries, well below the average. The difference in math scores, however, is that even our students from wealthy school districts are not doing well. They would score in only about the 50th percentile in math relative to students in other developed countries.⁶⁵ Among the students who outperformed Americans on the PISA were those from select schools in Shanghai who took the test. They had the highest average scores in math and reading of all 65 nations and regions undergoing the exam.⁶⁶

While math performance has increased in the United States in grades 4 and 8, the improvement has not been sufficient to move U.S. schools up in the international rankings. Indeed our rate of progress is right in the middle of countries that have participated in the international tests over the past 15 years.⁶⁷ Moreover, the average scores in the United States of course mask huge disparities in performance across different subgroups: rich and poor or racial and ethnic groups. As noted, the disparities are enormous and must be addressed.

One reason our progress is so poor and uneven is because we lack national standards agreed to by the states. Recent efforts to adopt a common set of rigorous standards in more than 40 states may address his problem. But not all states are on board, and in some states, concerns over “the nationalization” of standards is slowing down progress.

But the bigger reason is that the U.S. public education system relies heavily on local funds, typically local property tax revenues, which vary widely depending on the local wealth of a community. For instance, in Pennsylvania where schools rely on property taxes for most of their funding, one of the poorest districts, the Reading School district, has \$12,000 a year to cover the full cost of educating each a child from a combination of federal, state and local funding. Meanwhile, less than 50 miles away in the one of the wealthiest suburbs, the Lower Merion School District has more than \$26,000 available in federal, state and local funds to spend educating each child.⁶⁸

Indeed, according to a high-profile task force chaired by Joe Klein and Condoleezza Rice for the Council for Foreign Relations, “the American education system has rampant inequities: schools in richer neighborhoods are often better funded than schools in poorer neighborhoods.⁶⁹ Although considerable evidence suggests that how money is spent proves to be more important than how much is spent.⁷⁰ Thus, it will take efforts to both equalize funding and to incorporate broader based changes to bring about the desired better distribution of achievement.

Goal

The nation's teaching force will have the opportunity to acquire the knowledge and skills needed to instruct and prepare all American students for the next century

A consequence of unequal education funding is that the least experienced and prepared teachers receive the lowest pay and teach the most disadvantaged students. And the teaching corps itself is weak. America's teachers have strong academic credentials, yet with no improvement on national or international student assessment in decades it's clear that many teachers struggle to help their students learn.

This may be due, in part to the fact that high school students who choose to enter undergraduate programs for education have SAT scores on average in the bottom third of all students tested.⁷¹ That stands in sharp contrast to nations with impressive student results, such as Finland, which successfully recruit teachers from their top high school graduates.

The caliber of the students entering the field of teaching isn't the only problem. The 2001 federal No Child Left Behind Act was the first recent federal foray into boosting teacher quality by requiring that all teachers have at least a bachelor's degree, a state license to teach, and proof that each teacher has demonstrated content knowledge in the subject they teach. While 92 percent of teachers met the highly qualified teacher requirements by 2006, student progress hasn't budged.⁷²

This disappointing result is actually consistent with research that shows the aspects of teaching and teachers emphasized by the No Child Left Behind Act prove not to be consistently related to student achievement.⁷³ While there are very large differences among teachers in their classroom effectiveness, these differences are not very closely related to the background measures emphasized in the law and in many state regulations.⁷⁴

As a result, in 2011 the U.S. Department of Education challenged states through its National Race to the Top grant competition to create systems for training highly effective teachers and linking teacher-evaluation systems to student performance. Nineteen states have embarked on this new approach to boosting teacher impact, and the Center for American Progress finds many states are living up to their commitments to create these systems, and where the states are falling behind the federal government is forcing teacher effectiveness work to proceed.⁷⁵ The federal investment in these states is expected to create new models that can be applied in every state for training and rewarding effective teachers who have a track record of boosting student achievement.

Goal

Every adult American will possess the knowledge and skills necessary to compete in a global economy

The United States has made significant gains in recent years in opening the doors to post-

secondary education. Between 1975 and 2010, college enrollment immediately after high school rose to 70 percent of all students from 49 percent.⁷⁶ But the completion rates remained virtually unchanged.

Many American students who enroll in college are not making it to their second year of study, let alone a degree. One million freshmen each year from two- and four-year colleges don't return as sophomores.⁷⁷ And at least 48 percent of students who enroll in four-year degree programs fail to earn a degree in six years.⁷⁸ With at least 2 million students not enrolling in post-secondary education and another 1 million students who enroll but do not complete their degree programs, the United States is missing an enormous opportunity to improve the overall skills of the labor force.

The United States continues to have one of the most educated labor forces among OECD countries, but that's largely the result of high educational attainment among older workers—the benefits of 20th-century investments such as the G.I. Bill. Even so, the legacy of those investments is dissipating. According to the OECD's "Education at a Glance" indicators for 2012, the United States "is the only country where attainment levels among those just entering the labor market (25-to-34 year olds) do not exceed those about to leave the labor market (55-to-64 year olds)."⁷⁹

This shortfall in postsecondary attainment will have a serious economic impact. According to a report by the McKinsey Global Institute, the United States is expected to have a shortage

of 1.5 million workers with bachelor's degrees by 2020.⁸⁰ Economists at the Georgetown Center on Education and the Workforce reach a similar conclusion, arguing that employers will face a shortfall of 3 million workers to fill jobs requiring either an associate's degree or bachelor's degree.⁸¹

“ One million freshmen each year from two- and four-year colleges don't return as sophomores. And at least 48 percent of students who enroll in four-year degree programs fail to earn a degree in six years.

The skills shortage is already impacting our labor force. The McKinsey report says firms with openings are having trouble finding candidates in science, engineering, computer programming, and information technology. This is not surprising since the growth in STEM graduates is less than 1 percent annually.

Approximately 1.6 million students with college degrees enter the labor force each year. But if our high school graduates enrolled in college and finished their degrees, the United States could more than double the number of students graduating from postsecondary programs annually. That would mean close to 4 million highly skilled workers entering the U.S. labor force

each year, many of them in the STEM fields where our workforce is particularly lagging.

It is also important to note that postsecondary education is the most powerful driver of adult earnings. Studies consistently show that college graduates earn more than adults with just a high school diploma. According to the Bureau of Labor Statistics, an individual with a bachelor's degree earns \$55,000 while an individual with only a high school diploma earns \$33,000, an education premium of 67 percent. Further, a master's degree, on average, is worth about \$66,000 a year.⁸²

The United States still holds more than one-fifth of the total workforce with postsecondary education among OECD members and the leading developed and developing nations in the Group of 20, including India and China.⁸³ (see Table 1 on page 43) And the United States currently

has nearly twice the number of collegeeducated adults in our workforce as China. But America's competitive advantage is shrinking.

China and India have ambitious multiyear plans (see the next two chapters) to increase their annual college graduation rates. Given the rapid pace of educational improvement in both countries, it is imperative that the United States increase its share of highly skilled young adults who enter the global labor market to sustain a competitive advantage for the U.S. economy and stability and growth of the middle class.

The United States has made only minimal progress in improving educational attainment and access since setting national education goals in the late 1980s. If we are to compete we need to examine our progress on these essential building blocks of education and economic development and recommit to these goals.

Health

Education alone will not ensure that our children thrive in a changing economy. Access to good nutrition and health care is associated with better educational achievement, according to World Bank economists, making child health a key indicator of a country's human capital strength.⁸⁴

Over the past century, the United States has made great strides in ensuring that children lead healthy lives. Public health initiatives have

successfully stopped the spread of dangerous childhood diseases, reduced infant mortality and preterm birth rates, and expanded access to health insurance for children. One relatively strong measure of a country's basic health is the likelihood that infants live past their first birthday, which also correlates with educational and economic success.⁸⁵ More than 99 percent of the 4.1 million children born each year in the United States live past their first birthday.⁸⁶

The United States has also made great progress in improving access to health care. Ninety percent of children today have access to health insurance, largely through Medicaid and the Children’s Health Insurance Program, which combine to serve nearly 40 million children.⁸⁷ And the Affordable Care Act of 2011 made it possible to extend health insurance coverage to nearly every American child by banning the denial of health insurance coverage for children with pre-existing conditions, allowing children to stay on their parents’ plans until age 26, and promoting seamless coverage when children and families are transitioning from one health insurance plan to another.

Alarming trends in children’s health

The United States, like most developed nations, has essentially eradicated the traditional childhood illnesses of malaria, malnourishment, polio, and the like. In large measure both China and India continue to need to invest heavily to battle these diseases. Yet, despite the great gains in access to health care we are seeing an alarming rise in children with new forms of chronic health conditions. The rate of pediatric chronic diseases has skyrocketed in the past two decades, increasing to 27 percent in 2006 (the most recent year for which data is available) from 13 percent in 1994, a rise that cannot be entirely explained by broader and more accurate definitions of diagnosis and societal awareness.⁸⁸ Two health conditions are especially notable because of their long-term consequences on the children, their families, and the nation: obesity and asthma.

Obesity

Childhood obesity increases the risk of cardiovascular disease, diabetes, bone and joint problems, sleep apnea, and a host of social and psychological problems.⁸⁹ In addition, a longitudinal study of 5,000 high school seniors showed that students who are persistently overweight in high school are less likely to pursue higher education.⁹⁰ And according to the Centers for Disease Control and Prevention, “children and adolescents who are obese are likely to be obese as adults,” which puts them at increased risk for health problems throughout adulthood as well.⁹¹

This has become a serious health issue because the percentage of American children who are obese has skyrocketed in the past three decades, *more than tripling* between 1980 and 2008, from 5.7 percent to 19.2 percent of American children.⁹² That development places almost 10 million children at risk of serious health problems throughout their lives and has serious implications for the competitiveness of the U.S. labor force.

Asthma

Asthma is the single most common childhood illness.⁹³ As of 2008, over 180,000 children had asthmatic conditions severe enough to limit daily activities, affecting their ability to play with peers, enjoy quality sleep, attend school, and learn lessons once they get there.⁹⁴ Asthma is the predominant cause of children missing school. Nearly 60 percent of asthmatic children missed at least one day of school because of their disease in 2008.⁹⁵ In Texas, 1 out of 10 students missed two to three weeks of school

every year because of asthma in 2010.⁹⁶ Here, too, racial disparities are evident as black children are twice as likely to have disabling asthma as white children.⁹⁷

Developmental delays

America's children are also increasingly suffering from developmental disabilities. While more than 15 percent of children have been diagnosed with developmental delays, less than six percent of children receive the needed early therapeutic intervention to promote school success.⁹⁸

Here, too, the disparities between low- and middle-income families are pronounced. Children from very low-income families are almost twice as likely to have a disability than from middle-class and upper-income families.⁹⁹ Failing to identify children with developmental delays and provide early intervention services means that they face early school failure, drive up U.S. special education costs, and undermine these students' lifetime educational success.

Family income and childhood poverty

Studies show that American children who live in families with stable and good incomes do better in school, and, as a result, increase their chances of getting a good job as an adult.¹⁰⁰ Children who grow up in poverty have much higher dropout rates and reduced lifetime earnings.

The issue of children living in poverty has been a persistent problem for our nation. In 1980, 18.3 percent of children lived in poverty, rising to a peak of 22.7 percent in 1992, and then falling back to a low of 16.2 percent in 2000. But the Great Recession has made matters worse again.

Prior to the recession, 17.4 percent of American children lived below the poverty line. By 2009, the percentage reached 20.7, an increase of

almost 20 percent in only 3 years. In 2010, it rose to 22.5 percent.¹⁰¹ The percentage of children with at least one unemployed parent more than doubled between 2007 and 2010.¹⁰²

Approximately 44 percent of children in 2010—about 32 million in total—lived in households with incomes below the middle class standard of approximately \$46,000 for a family of four, up from 39 percent before the Great Recession.¹⁰³

Poverty has immediate costs to children through reduced nutrition, threats on their health, and increased stress. Governmental programs are, as discussed elsewhere in this volume, important for alleviating these prob-

lems. It is very likely that these children will face setbacks in personal health and education. Evidence shows that as family incomes decline, child health and school performance suffers. Children in low-income families are also less likely to graduate from high school or college and are less likely to be employed at age 25.

There is strong evidence, however, that the number of families in poverty each year is reduced by government programs such as providing supplemental nutrition assistance and the earned income tax credit, which offers a significant tax break to lower income working families. In fact, if poverty is measured through an alternative formula to take into account the value of cash income from all sources and the value of in-kind benefits such as nutrition assistance or housing subsidies then the rate of children in poverty falls. As an example, the 2010 percentage of children living in poverty—22 percent—would be only 18.2 percent if government benefits were considered.¹⁰⁴

But there are also the longer run problems related to education and the parents' contribution to learning. These problems are clearly more difficult to deal with because they involve deeper-seated issues of family and parent dynamics that are seldom affected by short run governmental programs. Thus, dealing with the long-term educational issues require broad approaches, including early education and extra programs and support in the schools for overcoming the educational disadvantages of children from poor families.

Pro-family workplace policies

The rise in poverty is not the only challenge facing America's families. Research demonstrates that children benefit significantly from time with their parent in the first year of life.¹⁰⁵ These gains can have a long lasting effect on a child's academic outcome. As a result, pro-family policies that enable parents to spend more time with their children in the first year of life will ultimately boost human capital economywide.¹⁰⁶

Yet, the availability of paid leave for the birth of a new child is spotty as well. Only one-third of private-sector employers offer short-term disability insurance, which typically covers maternity leave, and coverage rates for part-time and low-wage workers are particularly low.¹⁰⁷ The disparity also extends to minorities, as women of color are less likely to have access to paid maternity leave.¹⁰⁸

In addition, men are less likely to have access to paid leave after the arrival of a new child. Although 90 percent of Fortune 100 companies offer some form of paid leave after the arrival of a new baby, only one-third offer paid paternity leave.¹⁰⁹

Children also need their parents when they are sick. In the absence of a parent, American children historically relied on a close family member to care for them while one or both parents worked. But extended families and familial child-care options are no longer a consistent part of the modern American family, and the

United States remains the only industrialized nation that does not guarantee workers paid time off to provide family care.¹¹⁰ Today, less than one-third of children have a stay-at-home parent—compared with one-half of children a generation ago.

These conditions cause many parents to miss work to care for a sick child. But missing work often means forfeiting the day's wages—or losing the job entirely. While the Family and Medical Leave Act of 1993 provides unpaid, job-protected leave for family emergencies, such as a child's illness, only about half of the

workforce qualifies for unpaid leave under this law, and many of those workers cannot afford to take it because of its unpaid status.¹¹¹

The shortage of workplace protections in the United States affects most of the 65 million parents with children under age 18. Approximately 50 million of these parents were employed in 2010,¹¹² but only 11 percent of workers in the United States have access to paid family leave.¹¹³ In other words, out of 50 million working parents nearly 45 million must care for their children without paid leave.

Conclusion

The good news is that the condition of America's children has improved markedly in the last 100 years. Fewer children live in poverty, more children have access to health care, and more young adults graduate from high school and college than in the past. Our middle-class values—and our aspirations to create a society that allows for equal opportunity for all children and young adults to succeed—have led to unparalleled investment in public health, safety, and educational infrastructure for children. These investments have helped to fuel the engine of economic growth for generations.

But it is also true that China and India—whose populations far exceed that of the

United States—are learning from our successful economic example. They are making substantial investments to improve the health and educational attainment of their children. These two countries, by virtue of their phenomenal capacity for human capital development, present a potential challenge to our global economic position.

The current generation of American children will grow up to work in a global, technologically advanced economy in which they will increasingly be connected to peers who may live and work abroad, in countries such as China or India. That means America's ability to compete for high-skill and high-wage jobs in this global economy increasingly depends

on our willingness to invest in policies to boost educational skills and attainment, improve children's health, reduce child poverty, and increase parents' ability to support and care

for their children. Policymakers must work together with parents, communities, and employers to develop an ambitious economic plan to address these issues.

The rise of China's skilled labor force

China is fast developing a skilled-workforce that will soon outnumber—and may soon out-compete—America's workforce across a broad range of industries. The reasons: China is aggressively investing in its children. From its formal pre-kindergarten education through the university system, China is expanding access and quality to education and rapidly producing a massive workforce with the skills and technological capacity to work and compete in the global economy.

Educational opportunities remain highly unequal in China, as they are in India (see next chapter). China's workforce and educational institutions, in general, remain less developed and less effective than those of the United States. And spectacular poverty throughout the country makes low-income Americans appear rich by comparison.

But a population of 1.3 billion, more than four times that of the United States, means that even if millions of Chinese kids slip through the cracks, a vast and growing number will still graduate and enter adulthood with the skills and knowledge to excel in a globally competitive economy. And at every stage of a child's development and education

through graduation to the workforce, Chinese society and public policies are accelerating investments and attainment.

While the United States still has about twice as many college-educated workers, in 2010 China had the most students enrolled in higher education in the world. By 2030 it is expected to have up to 200 million college graduates, more than the entire workforce of the United States.¹¹⁴ Stunning as those projections are, the country's progress is even more remarkable given China's stable population since 1978 under its notorious "one-child policy." Consider the following snapshot of advancement:

- In 2009, 51 percent of Chinese 3- and 4-year-old children received at least one year of pre-school, up from 9 percent in 1980. China plans to provide two years of early learning and development prior to kindergarten to as much as 70 percent by 2020. In the United States, only 44 percent, or 3.5 million, of 3- and 4-year-old children are enrolled in publicly supported and subsidized pre-primary schooling.
- From 1980 to 2009, enrollment in vocational schools grew by 1,500 percent to 7.9 million.

- 4 million young adults a year are enrolled in “practitioning engineer” training—two- to four-year technical and vocational programs—up 520 percent since 1980. That’s 10 times as many students enrolled in engineering-related associates degrees or certificates than in the United States.¹¹⁵
- Nearly a quarter of university-age Chinese, or 29 million students, are enrolled in higher education programs, up from less than 10 percent in 1999, compared to about 30 percent of 18-to-24 year-olds in the United States, or 10.4 million students, enrolled in four-year universities.

In addition to investments in education, China is expanding its commitment to health care, social security, unemployment insurance, paid leave, and other pro-family social protections.

Unlike in the United States, such public commitment to early childhood development, educational development, and technological expertise is regarded in China as an integral part of overall national economic strategy. And this economic strategy will make China increasingly competitive in sophisticated industries where U.S. workers now lead the competition. By 2020 China plans to:

- Enroll 40 million children in preschool, a 50 percent increase from today
- Provide 70 percent of children in China with two years of preschool and with kindergarten
- Graduate 95 percent of Chinese youths through nine years of compulsory education

- Ensure that no child drops out of school for financial reasons
- More than double enrollment in higher education
- Double the share of the working-age population that completes higher education to 195 million workers—that’s more than the entire U.S. labor force.¹¹⁶

These are among the many reasons to be optimistic about China’s prospects for continued achievements building its youth into a skilled workforce to drive economic growth. They also include China’s investments in quality teachers and educational institutions that are bringing millions more children the opportunity to achieve their full potential and contribute to a growing economy.

Nonetheless, there are also reasons for concern in the deep, structural inequalities against which China’s policymakers are fighting. Unequal education and economic opportunities not only will constrain China’s progress, they threaten the country’s political and economic stability, too.

(Note: Analyzing educational commitments and progress made in China and other developing countries poses challenges in the availability of good data. Throughout, this report cites the most recent data available although in a number of instances the most recent data is not up-to-date.)

Though it faces serious foundational challenges, Chinese leaders are aware of and are devising strategies to address them. U.S. policymakers should not doubt China’s ability

to overcome even these very serious problems, and must take action to prepare the United

States for the competitive challenges that even an unequally growing China pose.

The ‘Great Leap’ backwards

Chinese education from revolution to reform

Education policies and economic conditions have risen and fallen together in post-revolution China. Following the “rehabilitation period” in the years immediately after China’s 1949 revolution, in what came to be called the 1957 “Hundred Flowers Campaign,” Chairman Mao Zedong and other leaders encouraged intellectuals and scientists to weigh in on the issues of economic and social reform in China. This brief opening soon gave way to another campaign, the “Great Leap Forward” of the late 1950s and early 1960s, intended to kick-start industrialization, technological deepening, and indigenous innovation from China’s grassroots.

During the Great Leap Forward, policies designed to squeeze “surplus value” from China’s large rural population failed miserably on economic terms.¹¹⁷ This deliberate transfer of resources from rural to urban populations in pursuit of a “modern” industrial economy deepened inequities that persist today. Widespread starvation ensued, with a population in the tens of millions estimated to have perished from famine. Rather than leaping forward, both the industrial base and the agricultural economy depreciated quickly in their productive and technological capacities.

Though in the 1960s the economy recovered somewhat, China’s overall technological innovation and efficiency systems languished and remained dependent on foreign assistance—material and technological—from its Communist Bloc allies. From 1966 through the death of Chairman Mao in 1976, a politically orchestrated “Great Proletarian Cultural Revolution” roiled Chinese society and disrupted its economy for a full decade. As part of this political campaign, some 18 million educated professional workers, high school and college students, and others were “sent down” to rural China to rediscover a peasant consciousness, with the goal of reinvigorating an economy literally starved by the 1950s “Great Leap Forward.”¹¹⁸

Rural resentment of (relative) urban privilege prompted Communist leaders to stoke an antieducational campaign as a way of keeping ideological fervor alive. The government closed numerous schools across the country, at all levels. College admissions stopped for six years and admissions for graduate training stopped for 12 years. The college entrance exam would not be administered again until 1977.¹¹⁹

While the number of “teachers” grew during the Cultural Revolution, teaching quality

eroded. The rural empowerment campaign privileged folksy “peasant” knowledge, and promoted many unqualified individuals to be teachers. The revolution also campaigned to “reform” curricula along ideological lines at the expense of general knowledge, creativity, and productivity enhancing skills. Enrollment in such schooling bloomed because policy decreed mandatory political education as well as education through work. As the economy degraded in productivity, there were very low opportunity costs to occupying kids in schools for several hours a day.

The Cultural Revolution ended when Chairman Mao died in 1976, but not before China suffered tremendous educational and economic stagnation at the hands of the social upheaval he and his followers orchestrated. Deng Xiaoping succeeded Mao as China’s leader, and inherited a country with an inefficient economy, outmoded technologies, and an undereducated and poor population. A new strategy was needed. Deng put opening and reforming China’s previously centrally planned economy and renewed commitment to education and science at the core of an economic revitalization strategy.

Continued on following page

In other words, China's economic boom since 1978 and its increasing human capital investment and attainment developed hand-in-hand.

Due to the education disruption of the Cultural Revolution, primary school enrollment was elevated at the start of China's economic and education reforms for those who missed out on education amid the social upheaval. As a result, the gross enrollment rate in primary education rose to 130 percent by

1989 from 114 percent in 1980. Gross enrollment measures the total number enrolled at grade level relative to the size of the age range of the population that would normally attend that grade level. That the enrollment rate registers over 100 percent reflects the fact that older youths previously prevented from participating in primary education were enjoying access to newfound educational opportunities. At last measure, in 2009, gross enrollment was down to 111 percent. (see Table 2 on next page)

The bubbling up and gradual decline of the gross enrollment rate shows a wave of social transformation that created educational opportunities never before available. In so doing, the reform-era government of Deng Xiaoping established in China a social norm for universal education with the expectation that this would provide a broadening basis for China's national economic competitiveness.

China's educational ascent

China took its first big step to rebuild the education system after the 1966-76 Great Proletarian Cultural Revolution with the 1986 Law on Compulsory Education, which mandated children complete nine years of schooling—six of primary school and three of middle school. The Education Law of 1995 affirmed national principles for nondiscriminatory access to educational opportunities, including limitations due to “property conditions.” The State Council, a top governing body, set in motion in 2003 a system to exempt all low-income students from all school and miscellaneous fees and textbook charges and to provide them with housing subsidies by 2007.¹²⁰

The 2000 national census, the most recent publicly available, shows the remarkable prog-

ress in Chinese educational achievement since starting economic reforms in 1978. (see box above) At that time, 88 percent of 80-year-old women had never attended any formal schooling. In the younger generation growing up in the era of economic and education reform, only 4 percent of 25-to-29 year-olds had never received schooling.¹²¹

Thanks to the education push, adult literacy climbed to 94 percent in 2009 from 64 percent in 1978.¹²² In a generation, China achieved levels of adult literacy comparable to a wealthy country, while only enjoying one-fifth of a wealthy country's per capita income.¹²³

Research from the World Bank shows that the average years of education for Chinese aged

15 years old and older increased to 7.9 years old by 2003 from 5.3 years old in 1978; for workers in the manufacturing industry average schooling increased to 9.4 years old from 8.1 years old over the same period. By comparison, the average for all workers in advanced economy OECD countries was just under eight years of schooling in 2001.¹²⁴ Reform efforts also are tackling some qualitative and access disparities in education. For instance, educational enrollment for China's ethnic minorities concentrated in rural and Western provinces is climbing.¹²⁵

These successes did not happen by accident, but because China made educated children and a skilled workforce a foundation of its strategy to build a dynamic and globally competitive economy. Now China's leaders aim to expand on their progress. China's educational goals through 2020, outlined in the 2011 12th Five-Year Plan are ambitious. But these ambitious goals derive from a commitment to invest in the country's education system from early childhood through entry to the adult workforce and by empowering educators to innovate and deliver a high quality education. (see Table 1)

TABLE 1
Major goals for education development in China, 2009 to 2020

	2009	2015	2020	Percent change
Preschool education				
# of children in education (million)	27	34	40	50%
Gross attendance rate 1-year kindergarten (%)	74	85	95	28%
Gross attendance rate preschool, 4 year olds (%)	65	70	80	23%
Gross attendance rate preschool, 3 year olds (%)	51	60	70	38%
Nine-year compulsory education				
# of students in school (million)	158	161	165	5%
Gross enrollment rate (%)	91	94	95	5%
High school education				
# of students in school (million)	46	45	47	2%
Gross enrollment rate (%)	79	87	90	14%
Higher education				
Total enrollment (million)	30	34	36	19%
Of which: # of postgraduates (million)	1	2	2	43%
Gross enrolment rate (%)	24	36	40	65%
# of people with higher education (10 ⁶)	98	145	195	98%

Notes: "Gross enrollment" measures total enrollment divided by the target age population. Terminology for China's various education levels is adapted to U.S. concepts. Source: National Bureau of Statistics, China Statistical Yearbook, 2010; China National Development and Reform Commission, 12th Five Year Plan, 2011-2015.

Families and early childhood development

Still very much a developing country, China is playing catch-up in creating the social policies and safety nets critical to early childhood development. Lack of good parental leave policies, social safety nets such as unemployment insurance, health care, and retirement savings programs, and broad opportunities for child care and early education mean that many kids in China start life at a disadvantage. But China is working to expand both pro-family workplace protections and access to and quality of early childhood care and learning.

Chinese society supports the rearing of children differently than does U.S. culture. Multigenerational Chinese households combined with the country's "one child" policy, and typically earlier retirement ages, mean there are often four grandparents available to provide child care while parents work. Even so, Chinese policymakers still see value in ensuring that women enjoy maternity leave, and that society invests strongly in structured early learning.

A broad body of economic research shows that such policies are increasingly important contributors to individual success and to a national economy overall.¹²⁶ The 1988 "Act of Protecting Female Staff and Workers," building on a maternity leave law in place since 1955, entitles women to no less than 90 days of paid maternity leave—including 100 percent pay for the 15 days prior to an expected birth and 15 more days for difficult births.

This law applies to full-time contract and permanent workers alike in companies designated as "state-owned," though not companies under other ownership classifications in which various government entities nonetheless still contain controlling interests. The law covered 36.6 million employees in 2003, or 11 percent of China's female labor force.¹²⁷ Covered women also get reimbursement of their medical check-up fee, midwife fee, operational charges, hospitalization fee, and medicine costs incurred during pregnancy.¹²⁸ Women working in private enterprises, and those self-employed or working in the informal sector largely fall outside the purview of such pro-family policies.

Laws on the books also provide benefits for pregnant women and working mothers in government or state-owned or state-reformed enterprises. Recent mothers are allowed break time during the workday to provide nursing to newborns.¹²⁹ Some localities are also experimenting with parental leave rights for men. In Shenzhen, the booming trade center bordering Hong Kong in southeastern Guangdong province, men receive 30 days paid paternity leave.¹³⁰

China is also working to expand access to early education opportunities. China's early learning and development system includes one year of kindergarten at age five and potentially two additional years of early learning in pre-school or head-start-type learning and child care centers for children ages 3 and 4. In China, all three of these years of early education are called "kindergarten." For participants, this three-year kindergarten fills the gap in early education between home-

based care in the multigenerational family and compulsory primary and middle school. For-profit early education institutions have also stepped in to satisfy demand for education while the government expands access to early education to more people.

The National Plan for Medium and Long Term Education Reform and Development, released in 2010, established a target of near universal coverage for one year of kindergarten over the following decade.¹³¹ The plan seeks to universalize access to quality kindergarten and to commit up to two additional years of publicly supported early learning preschool to serve 70 percent of kids.

In 1984 a mere 13 million Chinese children attended kindergarten. By 2009, the number doubled to 27 million, with 74 percent of kids participating. Pre-primary education is also expanding rapidly. Total preprimary enrollment in China reached nearly 30 million in 2009, up from 25 million in 1997, while the number of teachers rose to more than 1 million in 2009 from 836,000 in 1997.¹³²

China's goal is to again nearly double the number of children with access to quality of early childhood development services by 2020, rising to 95 percent enrollment. In the United States, 3.5 million 3- and 4-year-olds, or just 44 percent, participate in publicly funded preschool.¹³³ Today in China, more than half of preprimary education centers are privately run and financed, with 68 percent of preschool institutions privately run in 2010, up from 10.4 percent in 1994 to 17.8 percent in 1998.¹³⁴

China's early childhood progress faces some serious challenges.

The private early education system is increasing in cost, putting it out of reach to regular Chinese families. The cost of early education and child care for kids aged 6 and under amounted to 39 percent of household income in 2004, according to one study.¹³⁵

“ In 1984 a mere 13 million Chinese children attended kindergarten. By 2009, the number doubled to 27 million, with 74 percent of kids participating.

The Economist Intelligence Unit found that “In 2010, tuition and accommodation at Peking University, one of the country's best, was about US\$102 per month, thanks to government subsidies, whereas leading preschools charged up to US\$660 per month. China's government provides few subsidies for preschool providers and for underprivileged families. As a result of all this, China is ranked as the least affordable country in the Starting Well Index”¹³⁷

The quality of the early education varies widely and corresponds with each community's economic well-being and its ability to recruit and employ quality educators. Growing regional inequalities, such as the divisions between rural and urban communities as well as those between migrants and permanent residents in urban

communities, mean that many kids from disadvantaged families face challenges to access and quality of early education. Despite this inequality, China is expanding early education access to millions more children even if the gains now tend to be concentrated in urban areas.¹³⁶

Primary and secondary schooling

A 1986 law made nine years of education compulsory in China: six years of primary education, typically beginning at age 6 or 7, and three years of middle, or “junior secondary” school, until a child is 14 or 15. Compulsory education ends before high school, or what the Chinese call “senior secondary school.” Still, 80 percent of the eligible population in 2009, or 46 million students, were enrolled in high school, (see Table 2) At any given time, the sheer number of children enrolled in China’s primary and middle schools is staggering compared with the United States. With the swelled ranks in 1980 (see box on page 41), China furnished primary education to more than 146 million children. In 2011, China was educating nearly 100 million children per year in its primary schools. Middle-school enrollment grew to 52.8 million students in 2010 from 45.4 million in 1980. By 2020, China intends to enroll 165 million students in compulsory nine-year education, with a 95 percent completion rate. (see Table 1)

China’s middle school students in top-tier schools are showing superior performance thanks to expansion of access and improvement in quality of education. International aptitude test results in 2009 from select

Shanghai schools shocked the world by ranking first among 65 countries on the Program for International Student Assessments, or PISA, ranking. The United States ranked 17th.

Shanghai’s students from these select schools posted average test scores in math, reading, and science that were far higher than the average score for students in each of the other 64 nations tested, including the United States, Germany, Japan, and Finland. Although Shanghai’s top ranking for average score was the big news, educational experts took note that the stunning results reflected performance in some of the most elite schools in the metropolis. Test takers at these schools had the largest share of students who scored “advanced” or at the highest levels of proficiency compared with all other participating nations.

To be sure, by testing only at some of Shanghai’s most elite schools, the PISA results do not indicate an average level of performance for all Chinese students. Rather, this level achieved in these Shanghai schools should compare performance with similarly privileged students in advanced economy countries. The Shanghai results are thus compelling because, only two decades ago, meeting the international average for academic achievement would have been unlikely anywhere in China given the miserable shape of the Chinese education system.

Most of China’s education system does not live up to the standards of Shanghai’s top-flight schools, yet the lessons learned there are being applied and tremendous resources invested

throughout the rest of the country. As a result, China's overall educational achievement can be expected to accelerate in coming years.

Indeed, China's public investment in education is producing students with a range of skills that will help them compete successfully in a global economy. English and other foreign language instruction is often begun in the third grade and continued through middle school, at minimum. Thanks to high demand for language skills, for-profit English and other foreign language institutions are also in high demand and growing in numbers. And the drive to complete high school and higher education is mounting as China embraces a social norm of universal education.

In the early years of economic reform, high school enrollment in China measured less than 40 percent. Now, nearly equal to U.S. high school enrollment rate of 86 percent, China has set the target of boosting high school enrollment from the current 80 percent to 90 percent by 2020.¹³⁸

Post-secondary education

China's higher education system, too, is making strides in quality, access, and achievement. In the early 1980s, as China emerged from the Cultural Revolution, only about 3 percent of qualifying people enrolled in higher education or higher vocational training. By 1999 university enrollment climbed to 9 percent and the central government set a goal of increasing enrollment to 15 percent within a decade. Accelerating enrollment growth helped China

achieve that goal by 2002, and by 2009, 24 percent were enrolled in higher education.

In 2010 China became the world's largest provider of higher education.¹³⁹

Over the next two decades, China will grant degrees to more than 200 million college graduates.¹⁴⁰ That's three to four times the annual U.S. rate between 2000 and 2009, according to the U.S. Census Bureau. Not all of China's degree-holders, however, are prepared with the skills necessary to perform at a global level. In a 2005 McKinsey report on international workforce competitiveness and skills gaps, a survey of global managers and business leaders concluded that only about 10 percent of China's engineering graduates had the requisite technical skills and knowledge required by many multinational corporations.¹⁴¹

But things are changing. Improvements at lower levels of the educational ladder percolate up through successive classes of Chinese youths, and China's universities are improving, expanding services, and attracting high quality faculty from around the world. In 2003 China was home to 12 of the world's top 500 universities; by 2010 China had 22, making China sixth among countries with the most universities on the list.¹⁴² The United States still ranks first, with 180 of the world's top 500 universities. China's rise up the rankings is no accident. Yale University President Richard Levin says China, India, and other Asian countries are overhauling national higher education systems "to sustain economic growth in a postindustrial, knowledge-based global economy."¹⁴³

That overhaul is evident in the STEM degrees produced at Chinese universities. In 2007 it surpassed the United States in the number of science and engineering doctoral degrees awarded. As of 2008 Chinese institutions of higher education produced 1.14 million STEM bachelor degree graduates a year, up from about 360,000 in 2000.

An increasing number of Chinese students are pursuing higher education overseas as well. In 2010 more than 1.5 million of them enrolled in higher education abroad, more than five times as many as a decade earlier.¹⁴⁴ In the 2010-2011 academic year, China once again ranked first in foreign countries sending higher education students to institutions in the United States, accounting for nearly half of China's overseas students.¹⁴⁵ These Chinese students studying abroad are increas-

ingly returning home to launch careers with their new skills. These so-called sea turtles are drawn by culture and family ties, but often jobs recruiting foreign-educated students offer exceptional incentives and relative levels of income and living standards that cannot be matched in countries outside of China.

For the time being, it seems China's ability to supply freshly minted college graduates is outpacing the demands in its domestic economy for such workers. News stories routinely report the difficulty faced by recent college graduates in finding work. This is an issue that China's policymakers take seriously, making it more likely that college educated workers in China will be looking to capture a greater share of the world market for high-skilled and technological jobs—work that might otherwise be performed in the United States.

Investing in the next generation of China's workers

How is China achieving these successes?

By increasing the level of public and private resources devoted to education, and by improving teacher quality in pursuit of the goals of developing a highly skilled workforce capable of driving the country's sustained rapid economic growth. So let's look briefly at the public resources going toward improving the education of the next generation of Chinese workers.

Public spending

Since the start of economic reforms, China has been accelerating public spending on education, health, and other social investments essential to creating opportunities for children and for developing a skilled workforce. Official Chinese spending statistics combined education-spending statistics with spending on health care, science, and cultural and arts

investments—although education comprises the lion’s share. In 1978 China spent 11 billion yuan on this group (less than \$2 billion at current exchange rate), but by 2006 that climbed to 743 billion yuan (\$117 billion), a 66-fold increase (see Figure 3).

The rapid growth in spending is not merely a mirage cast by China’s hotly growing overall economy. From 1978 through 2006, spending growth on these public investments averaged 15 percent annually—outpacing overall average economic growth of 9.4 percent per year. After 2006 China changed its method of statistical reporting, and the change showed that between 2007 and 2009 public education spending grew 19 percent a year on average.

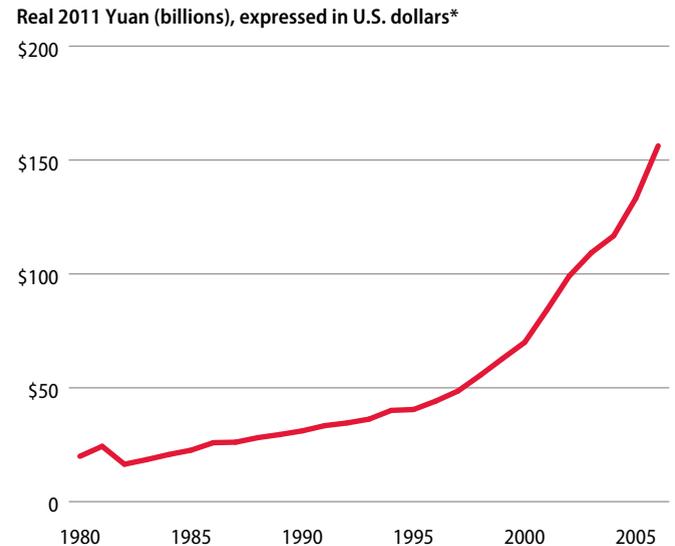
And more accelerated education spending appears in the offing. In early 2012 a World Bank report on China’s 20-year economic outlook recommended that China further increase education spending by 1-1.5 percentage points of GDP.¹⁴⁶

More recent (but limited) data from China’s Ministry of Education show the various uses of public funds from 2001 to 2006, including for different levels of schooling.¹⁴⁷ In just five years, total public spending on kindergarten and early learning increased 91 percent, from 7.2 billion yuan (\$1.1 billion) in 2001 to 13.6 billion (\$2.1 billion) in 2006, after adjusting for inflation to current prices. (see Table 2)

By 2001 China’s compulsory nine-year education system reached near universal coverage. But China continued its commitment to

FIGURE 3
China’s devotion to education

China’s public spending on education, health, science, and culture



*Note: Data converted to dollars at current market exchange rate.
Source: Authors’ analysis of China Statistical Yearbook, Penn World Tables, and IMF World Economic Outlook data.

TABLE 2
Rising investments in Chinese education

Recent acceleration at all levels of China’s education spending*

	2001	2006*	Percent change
Kindergarten and pre-kindergarten	¥7.2 (\$1.1)	¥13.6 (\$2.1)	90.8%
Primary	141.1(22.2)	256.8 (40.3)	81.9%
Middle school	15.2(2.4)	28.2(4.4)	84.7%
Vocational	79.1(12.4)	157.8 (24.8)	99.5%
High school	26.4(4.1)	82.5(13.0)	212.6%
Higher education	130.3(20.5)	323.7 (50.9)	148.5%

*Billion yuan (billion dollars, at current market exchange rate), adjusted for inflation to 2011 price level.
Source: Authors’ analysis of China Ministry of Education data and U.S. Federal Reserve data.

expand access and quality of basic education, as evidenced by 82 percent growth in spending on primary schools alongside the 100 percent growth in spending on middle school education between 2001 and 2006. Middle school-level vocational education also enjoyed an 85 percent increase in funding from all levels of government. Vocational education prepares students for productive careers requiring technical training and skills development, but not necessarily higher academic education.

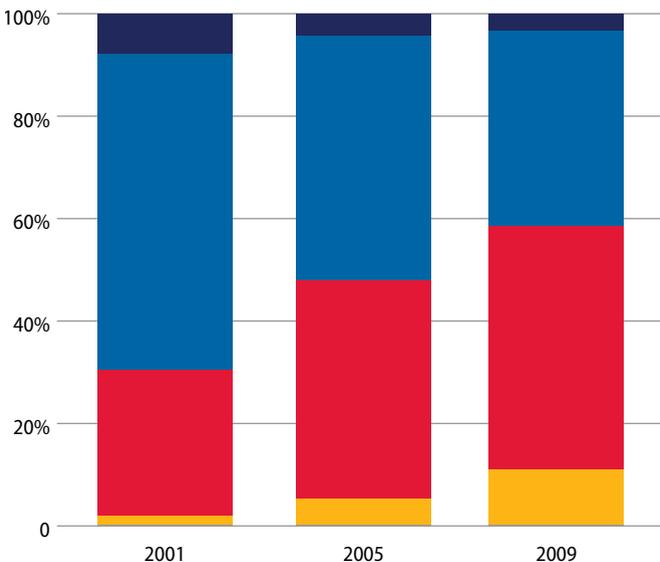
High school education, though not mandatory, is quickly becoming the minimum standard and expectation for the next generation of Chinese workers—and Chinese policymakers set a goal to expand high school education from 79 percent today to 90 percent by 2020. And they are putting their money where their mouth is: In just the five years from 2001 to 2006, public spending on high school more than tripled to 82.5 billion yuan (\$13 billion) from 26.4 billion (\$4.1 billion). (see Table 3)

Higher education, in which China expects to increase enrollment rates by 65 percent by 2020, received a nearly 150 percent increase in public spending from 2001 to 2006, growing to 324 billion yuan (\$51 billion) from 130 billion yuan (\$21 billion). (see Table 2)

FIGURE 4
China's commitment to teacher excellence
 Improving quality of China's primary school teacher corps

■ Undergrad ■ Associate ■ High school grad ■ Below high school grad
 ■ Graduate school*

Percentage of teachers with designated education level



* Graduate school educated teachers are increasing in numbers, but less than one percent of total primary school teachers.
 Source: Author's analysis of China Ministry of Education data.

Investment in teacher quality

China is rapidly training new educators and investing in the quality of its education workforce. The number of full-time teachers working in primary schools has grown to 5.6 million from 5.5 million in 1980. The number of secondary school teachers has reached 5.9 million from 3.2 million. And the number of university-level teachers has grown to nearly 1 million from 250,000.¹⁴⁸

The number of teachers enrolled in specialized teacher training schools nearly doubled to 921,000 by the late 1990s from 482,000 in 1980, before China began integrating its teacher training programs from specialized two- to three-year programs into the standard

four-year university system.¹⁴⁹ The result has meant more and better trained educators teaching in China's schools. As more Chinese youths are gaining access to educational opportunities, the quality of that education is steadily improving, too.

More than just an expanding educational workforce, China is improving the quality of its

teachers. In 2001, 70 percent of primary school teachers in China had no more than a high school education. By 2009 nearly 60 percent of primary teachers had earned a higher degree. The number of teachers with bachelor's degrees increased 66 percent in just eight years. The percentage of primary school teachers with graduate degrees grew five-fold by 2009, from less than 1 percent in 2001. (see Figure 4)

Challenges and the road ahead

Across all levels of China's education system—from early learning and pro-family policies to technical training and advanced education—China is making significant commitments to boost the nation's human capital foundations.

Serious challenges remain, however. While post-revolution reform and growth delivered hundreds of millions of people from poverty, uneven growth has exacerbated numerous inequalities. And as inequality has developed, the correlations between parental socioeconomic status and educational attainment and the child's educational attainment have strengthened, meaning that social factors increased in importance relative to individual abilities in determining one's education and economic opportunities.¹⁵⁰

That has created a troubling parallel to the U.S. education finance system, in which economically worse-off locales lack the fiscal resources or private incomes to invest in educational

expansion and quality improvement. As a result, place of residence is among the most important factors predicting school enrollment and graduation patterns in China.¹⁵¹ Inequities in access to and quality of education divide along rural-urban, coastal-interior, migrant-resident, and gender dimensions.

One of the casualties of these disparities is educational equality. Lower local expenditures are associated with low and often late wages paid to educators, heavy workloads, and high student-to-teacher ratios. Combined with more difficult living circumstances in the remote and perhaps less-desirable locations, poor compensation is likely to “diminish teachers' capacity to offer their best effort in the classroom,” according to economists Lynn Paine and Yanping Fang.¹⁵²

China's government is cognizant of these multidimensional patterns of inequality and is

building strategies to address them. International institutions and China's government are working to expand educational access and opportunities, while the emergence of for-profit—though not necessarily *private*—educational institutions, so-called *minban* schools, have helped meet the demand for education from wealthy families and a growing middle class.

To be sure, not all *minban* schools are created equal, and a segmented market has developed based on social privilege, household income, and wealth. Second-tier, lower quality schools serve rural, internal migrants, and families who can't afford the costs of attending formal schools in the areas where they reside.

And at the other end of society, pedigreed families—those with political *guanxi*, or “social relationships,” and new wealth—compete for slots in private schools, tutoring, and test preparation

programs as well as for extracurricular activities such as music lessons and English classes. Recent research finds that direct monetary payments by wealthy families increasingly affect admissions into high-quality public schools as well as into prestigious private institutions.¹⁵³

In 1998, the Ministry of Education and the Public Security Bureau jointly shifted policies to help rebalance inequities affecting the regional, rural-urban, and migrant worker divides by shifting the responsibility for providing educational facilities for migrant families' children from the (typically poorer) sending region to the (typically better off) receiving region. Though making strides, this policy faces challenges being implemented at the local level, where incentives to elevate user fees on migrant families' children exist and can make schooling too expensive or can limit them to lower quality “migrant-sponsored” schools.¹⁵⁴

Conclusion

Despite these serious challenges, the sheer numbers, momentum, and a national economic strategy prioritizing human capital development means that China will soon be producing highly skilled workers on a scale that surpasses that of the United States. China's government, which has a track record of mobilizing massive social resources to address critical economic issues, has made increasing human capital development a cor-

nerstone of the country's overall economic development strategy.

China is by no means the only country taking actions to develop its human capital foundations as a means to a stronger, more competitive economy. India, too, is implementing a strategy and making strides in developing its human capital. To this nation we now turn.

The rise of India's skilled labor force

India's strategy of growing its economy by boosting the skills of its young workforce is reaping benefits and putting competitive pressures on the United States. As a result of these and other policies enacted since gaining independence from British control in 1947—when the overwhelming share of Indians lived in abject poverty—India's middle class is today 100 million strong.

Although these Indians account for only 10 percent of the population, the dramatic growth in the Indian middle class means it is now one-third the size of the total population of the United States.¹⁵⁵ And India's economic gains were made possible by nearly 30 years of increasing levels of public investment in human capital and infrastructure that have fueled its economic development, child health care gains, and educational advances.

In 1947 more than 80 percent of the Indian population was illiterate and optimistic estimates suggest that less than half of children attended school through fifth grade.¹⁵⁶ Since 1950 India's illiteracy rate has declined each year, and now stands at 26 percent.¹⁵⁷ It suc-

cessfully enrolls nearly every child in elementary school, and efforts to expand college access are also showing great promise. By 2003 India had eclipsed the United States, graduating more students with bachelor's degrees.¹⁵⁸

India is the world's most populous democratic and capitalist nation, yet it relies heavily on central planning to steer its economic growth. The Indian National Planning Commission's five-year plans serve as the basis for carefully directing national investments in the private economy and in the public institutions that India believes are necessary to cause the private market to flourish. India's human capital planning efforts are designed to align India's education sector to the workforce needs of both the current and future economy.

In India's five-year plan, investment in human-capital planning ranks second only to the level of national public investment in rural economic development. The country is about to adopt its 12th Five Year Plan to guide public investment from 2012 through 2017.¹⁵⁹ Among the goals anticipated to be included in this plan are:

- Expanding pre-school to prepare at least 60 percent of incoming first grade students for first-grade instruction.
- Providing for universal enrollment in secondary education, growing the enrollment from 35 percent to 75 percent in what is known as upper secondary school, equivalent to 11th and 12th grade in the United States. This means there may be as many as 20 million Indian students graduating from high school each year, compared with the slightly more than 4 million graduates U.S. high schools produce annually.
- Increasing the number of Indian college students by 26 million, which would bring total college enrollment in degree-granting programs up to 40 million students, of whom 8 million could graduate with the Indian equivalent of a bachelor's degree each year. By comparison, the United States had 1.6 million students earn bachelor's degrees in 2009.
- Substantial new investments and reforms that boost educational quality from pre-kindergarten through post-secondary institutions, including a stronger national role in curricula; educational materials; and teacher training, qualification, and accreditation.

While India's educational advancements in recent years are impressive and worthy of study, the country must still confront massive human capital challenges.

Life for most families in India is hard. More people live in poverty in India than anywhere else in the world. Yet the latest data available show that the number of families living in desperate poverty dropped by 41 percent from 1983 to 2010.¹⁶⁰ That's a good indication that India's strategy for economic growth is lifting more families out of poverty and closer to a middle class standard of living.

Of course, high rates of poverty mean that the nation also has large numbers of very sick children. India's national efforts to expand health care to children are gaining ground, but well over 40 percent of children under five are malnourished, and childhood disease rates are still staggering. Poverty in India also contributes to alarmingly high rates of child labor and teenage marriage among young girls.¹⁶¹ Both of types of child exploitation are undermining national efforts to provide universal education and promote economic growth. Finally, its education system is among the world's most expansive, but rapid growth has brought with it significant quality control challenges.

India, despite these obstacles, is on the human capital ascent. And that's because India's National Planning Commission in its successive five-year plans has put in place strategies to overcome these challenges and to build one of the world's largest free early childhood-to-college education systems—and is making the sort of progress that should make the rest of the world sit up and take notice.

India on the ascent

India's education system faces challenges, but its progress in educational access and attainment has put it on a path to be one of the world's strongest economic powers. India's National Planning Commission predicts that the labor force in India will increase by 32 percent over the next 20 years (compared with an expected 1 percent projected growth rate in the United States through 2030).

Rising incomes are causing more families to value education and to be able to afford to help their children access more years of schooling. The most recent household survey data in India shows that as incomes are rising, so too are the educational gains of children.¹⁶² When India gained independence 67 years ago, the nation's literacy stood at approximately 18.3 percent.¹⁶³ It was 74 percent in 2011, even as the population nearly tripled to 1.2 billion.¹⁶⁴

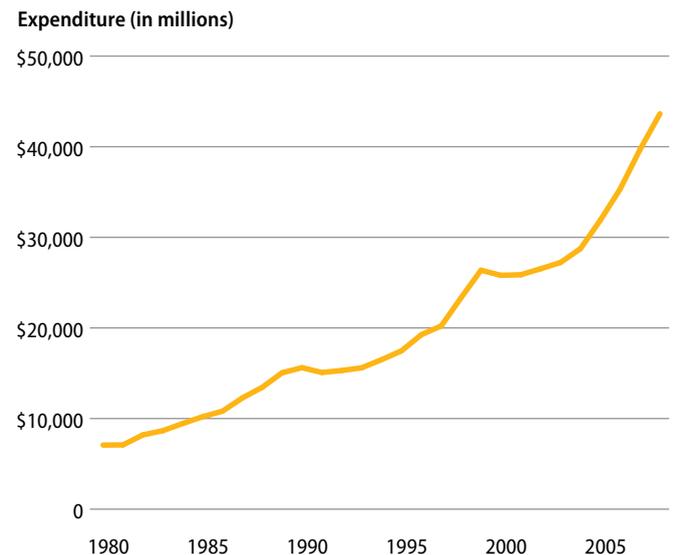
So how has India achieved this progress? Progress has resulted directly from national policies that have enabled more than 700 million children and adults to acquire basic literacy skills, and then move up the economic food chain because of their improved educations.

The Indian strategy begins with increased public investment in education and training over the last 20 years. Investment in education grew to about 2 trillion rupees (\$44 billion) in 2008, the latest year for which publicly avail-

able data are available, from 503 billion rupees (\$11 billion) in 1986.¹⁶⁵ India's public expenditure on all levels of education, as a percentage of both government spending (12.73 percent in 2005-06) and gross domestic product (3.46 percent in 2005-06), is comparable with the level of total public expenditures of United States with 13.7 percent and 5.3 percent.¹⁶⁶ (see Figure 5)

FIGURE 5
India's rising investment in education

Total expenditures on education, 1980 to 2008, in 2011 U.S. dollars



Author's Calculation Based On Sources: http://mhrd.gov.in/sites/upload_files/mhrd/files/Public%20Expenditure.pdf, <http://research.stlouisfed.org/fred2/data/AEXINUS.txt>, <http://www.imf.org/external/pubs/ft/weo/2012/01/weodata/index.aspx>

This ramped up level of public investment made possible the building of a universal primary school system and a robust higher education sector. It's also enabling the expansion of secondary school infrastructure. (see Table 4) As a result, India is outpacing the United States on the number of students attending 12 years of school and completing the Indian equivalent of a bachelor's degree. (see Figure 6)

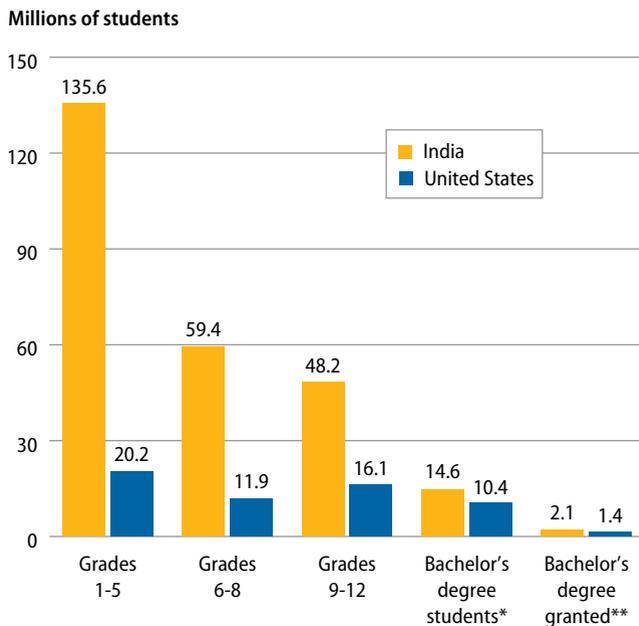
Families and early childhood education

India's strategy to promote infant and early childhood wellness includes limited rights to maternity leave and to child care for working mothers. India's Maternity Leave Act of 1961 offers working mothers up to three months of paid leave—protections lacking in the United States.¹⁶⁷ But legal and cultural barriers conspire to cause new mothers to return to work quickly.

Large sectors of the economy are exempt from the federal law, and extended family networks offer care for newborns and rely on the income of mothers returning to work quickly after delivery of their children. The result: slightly more than 90 percent of women return to work soon after delivery.¹⁶⁸ Like maternity, laws on the books require factories and other industrial employers to have on-site child care centers for the children of working mothers. But the continued prevalence of the extended family structure often means that children are cared for by a relative if their mothers are employed.

Like most developing nations, immediately after independence India's national goals regarding the development of its young children focused primarily on the basics such as on access to clean drinking water, immunization, and nutrition. Frustrated by decentralized efforts to improve the health conditions of children, the Integrated Child Development System was launched in 1975 to

FIGURE 6
India's student advantage
Comparison in enrollment of students by stage of education in 2009-2010



*Most Recent Values: 2010-2011

**Most Recent Values: 2005

Author's Calculation Based On Sources: http://mhrd.gov.in/sites/upload_files/mhrd/files/SES-School-2009-10-P.pdf, <http://nces.ed.gov/pubs2011/2011347.pdf>, <http://www.ugc.ac.in/pub/HEglance2012.pdf>, http://nces.ed.gov/programs/digest/d11/tables/dt11_203.asp, http://www.eastwestcenter.org/fileadmin/resources/education/ed2020_pdfs/India2010.pdf, http://nces.ed.gov/programs/digest/d10/tables/dt10_296.asp

TABLE 3

Indian education by the numbers

Grades 1-5	2009-2010	2017	Percent change
# of students in school (million)	135.6	-	-
Gross enrollment ratio (%)	115.4	-	-
Grades 6-8			
# of students in school (million)	59.4	-	-
Gross enrollment ratio (%)	81.5	-	-
High school education			
# of students, grades 9-10 (million)	30.5	48.7***	59%
Gross enrollment ratio, grades 9-10 (%)	62.7*	100	59%
# of students, grades 11-12 (million)	17.6	36.8***	108%
Gross enrollment ratio, grades 11-12 (%)	35.9*	75	108%
Higher education			
Total enrollment (million) – Includes graduate, post-graduate, research, and diploma/certificate	16.9	23.7***	40%
Of which: # of postgraduates (million)	2	2.8***	40%
Gross enrollment ratio (%)	15	21**	40%

Sources: http://mhrd.gov.in/sites/upload_files/mhrd/files/SES-School-2009-10-P.pdf, <http://data.worldbank.org/indicator/SE.PRE.ENRR>, <http://www.ugc.ac.in/pub/HEGlance2012.pdf>, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1652277, http://planningcommission.nic.in/aboutus/committee/wrkgrp12/hrd/wg_revvocational.pdf, http://planningcommission.nic.in/aboutus/committee/wrkgrp12/hrd/wg_hiedu.pdf

*Other Ministry of Human Resource Development documents place these figures at 58.5 and 27.85 respectively. The figures above have been chosen because they correlate with the enrollment totals provided, which were not available for the alternative estimates.

**Source states they want to achieve this figure 'by XII Plan', which the author has assumed to mean by the completion of the plan in 2017

***Authors calculations. These figures were calculated by using the 2009-2010 gross enrollment ratio and enrollment totals to calculate the approximate total number of persons in the relevant age cohort. Then the desired 2017 percentage was used to calculate a rough enrollment total for 2017. This would of course assume that the number of children in the relevant age range would not have changed whatsoever, which is unlikely, but this method provides an approximation of what these figures might look like if target GERs were achieved

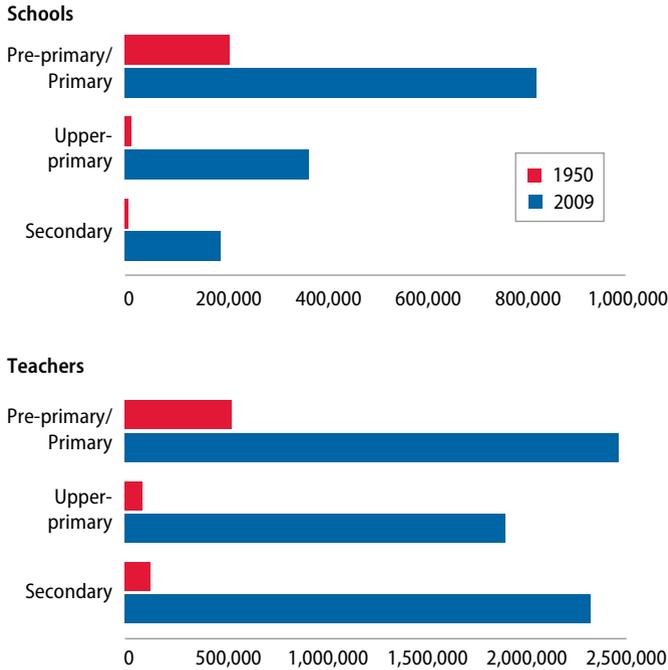
equip new mothers with the knowledge and basic resources needed to boost the health outcomes of infants and toddlers. Efforts to build the infrastructure to reach and offer some education to the approximately 160 million children under 6 years old began in earnest in 2007 with the 11th five-year plan. Now the world's largest early childhood program offers approximately 38 million children some pre-school instruction.¹⁶⁹

Without question, the reach of the effort is impressive, and some research indicates that children who participate in the Integrated Child Development System services are more likely to persist through grade six. But the system is too under-resourced to offer consistent services at even a moderately reliable level of quality. The Economist Intelligence Unit ranking of national early childhood systems placed India at the bottom of the 45 nations reviewed

FIGURE 7

India's growing education system

The number of schools by instruction level and teachers by instruction level, 1950 and 2009



Sources: <http://www.educationforallindia.com/page101.htm>, http://mhrd.gov.in/sites/upload_files/mhrd/files/SES-School-2009-10-P.pdf, http://planningcommission.nic.in/plans/planrel/fiveyr/10th/volume2/10th_vol2.pdf

with respect to affordability, accessibility, and quality on the Starting Well Index.¹⁷⁰ As a result, most children still start school without even a basic understanding of numbers, letters, or other basic learning skills

Primary and secondary education

India's efforts to create a high-quality early education system pale in comparison to the national muscle and resources used to ensure

the constitutionally guaranteed six years of free public elementary education. In 1950, less than half of all Indian children between the ages of 6 and 11 were enrolled in primary school.¹⁷¹ By the 2009 school year, the latest for which enrollment data is available, 135 million young children—nearly the entire elementary school-age population—were enrolled in primary school grades.¹⁷² While the United States is also successfully enrolling all of its students in primary school, the number of children attending grades 1 through 5 in India is three times the total number of students enrolled in kindergarten through 12th grades in America.

To accomplish this goal, the Indian federal government provided the funds to build and outfit more than 600,000 elementary school buildings and to train and hire 1.9 million new primary school teachers.¹⁷³ To boost school attendance it also created a school lunch program to feed well over 100 million children a day.¹⁷⁴ About 31 million U.S. children receive school meals.¹⁷⁵

Although the national government is not responsible for middle and upper school access (that's the purview of the states), the same trends persist in Indian middle and high schools. More than a half a million new schools have been built in the last 60 years for middle and high school students, outfitted with 4 million newly trained teachers.¹⁷⁶

Middle school enrollment in India (grades 6 through 8) skyrocketed to 59.4 million by 2009 from 3 million in 1950.¹⁷⁷ Today, for every American middle school student there are at least five children attending middle school in

India. Likewise, there are 48.2 million Indians in grades 9 through 12, or three times as many as in the United States in 2009. Approximately 8.2 million Indian students completed 12 years of school in 2010, compared with approximately 3.7 million American high school graduates.¹⁷⁸ (see Figure 7)

The World Bank projects that even with no change from current policy and no substantial increase in annual secondary school investments, the percentage of Indian students who are of age to be in 11th and 12th grade and are actually enrolled will rise from 35 percent in 2009 to 60 percent by 2020.¹⁷⁹ (These projections assume the Indian economy grows at an annual rate of at least 7 percent and that spending on secondary education increases by only 0.2-0.3 percent of GDP per year.) This means that in eight years there will be approximately 14.7 million Indians graduating from high school every year, or over three times the number in the United States. If the Indian government achieves its ambitious plan of increasing the gross enrollment rate in these grades all the way to 75 percent over the course of the 12th Five Year Plan, this number could approach almost 20 million.

Post-secondary education

The Indian government plans to enroll 40 million Indians in higher education by 2020. At this level of enrollment, assuming the current rate of degree completion, India's colleges and universities could be conferring 8 million bachelor's degrees annually by 2020, compared

with around 2 million in the United States.¹⁸⁰ This trend has been visible for some years, but it has accelerated recently. Indian colleges were already awarding 600,000 more bachelor's degrees than U.S. colleges as of 2003.¹⁸¹ From 2006 to 2010 the number of students entering degree granting colleges or universities in India grew by 4 million students.¹⁸²

“ Article 45, Indian Constitution:
The State shall endeavor to provide
Early Childhood Care and Education
for all Children until they complete the
age of six years.

In 2010 nearly 15 million Indian students were working toward their bachelor's degrees, compared with about 10 million students at U.S. colleges.¹⁸³ (Some Indian bachelor degrees are awarded in three years, based on the British Commonwealth post-secondary system, while in the technical fields the degrees are awarded after four or five years of study.)

U.S. policymakers concerned about global competition often worry about the rising number of Chinese and Indian students getting engineering and related science degrees, compared with the number in the United States. Although China and the United States have many more universities among the top 500 in the world, India does have one university—the

Indian Institute of Science—in the top tier.¹⁸⁴ Additionally, some of India’s select Institutes of Technology have also appeared in the rankings of world’s top schools over the past decade.¹⁸⁵ These elite institutions were created by the national government, which is currently in the process of expanding their ranks from seven campuses to 15.¹⁸⁶

The Indian government has made graduation in engineering and advanced technology a national priority area of investment. And the results are impressive so far. In the last seven years the number of four-year degrees conferred in engineering, computer science, and information technology has tripled.¹⁸⁷ While the growth in these fields has tripled, the number of students getting similar degrees in the United States has stagnated at lower levels and is projected to grow by less than 1 percent a year through 2020, according to the McKinsey Global Institute.¹⁸⁸

India national plans have also guided investments in the expansion of post-secondary

institutions that offer diplomas and certificates as well. These are lower level post-secondary degrees available in trades, crafts, and lesser-skilled jobs in the technology sectors. Annually about 300,000 students attend polytechnics, which typically prepare diploma level students in the engineering trades. Well over 700,000 students annually attend technical and trades training programs, and nearly 160,000 students are in apprenticeship training programs.¹⁸⁹

Just as in China, Indian college graduates don’t all fare well in the global marketplace. These educational quality issues translate into economic challenges. A survey of multinational employers found that only 10 percent to 25 percent of the country’s college graduates were acceptable to multinational corporation’s hiring managers, according to a 2005 McKinsey & Co. survey.¹⁹⁰ Even in the field of engineering, where India is thought to excel, only a quarter of the graduates were considered viable candidates for positions with these companies.¹⁹¹

Conclusion

Being the second most populous nation in the world gives India a significant advantage, but the nation faces serious problems as well. A significant percentage of students lack basic math and reading skills. And progress is uneven, with a larger share of poor students possessing weaker skills than students from more well-off families.¹⁹² Indian students tested in two Indian states were found to perform among the weakest among 74 nations that participated in the Program for International Student Assessment in 2009.

Quality challenges also are so persistent from pre-K through post-secondary institutions that both the 12th Year Plans and World Bank investments are increasingly shifting from access strategies needed to boost the education system's integrity and quality. Yet even with troubling quality problems, the number of Indian students who graduate with the skills needed to succeed in college far exceed the numbers of students who are doing so in the United States.

India is expected to release its next five-year plan in the fall of 2012. The 12th plan will propose even higher levels of education investment through 2018. There are signs that increased spending will target greater access to middle and high school, address the curricula and teacher quality challenges, and dramatically expand the number of top tier colleges and universities.

If India applies only a modestly more intensive effort to increase educational access and undertakes the hard work to boost the education system's quality, it will produce higher quality college graduates at a much faster clip than the United States. This could enable India to make an even larger contribution to the global economy in the high-value fields of scientific research, engineering, and information technology. That will give India a greater role in precisely those sectors where experts expect economic growth to concentrate.

Insights and best practices in national education policies

America's economic prosperity historically rests on a relatively well-educated workforce. For most of the 20th century, the United States led the world in the percentage of college graduates between the ages of 25 and 64. This well-educated workforce served as a strong foundation for continuous innovation and productivity gains, supporting a steadily increasing standard of living.

But this important competitive advantage has declined in recent years as China, India, and other potential rivals have increased their investment in education and human capital development. Our international competitors are intently focused on closing the education and skills gap that has allowed the United States to dominate the global economy since World War II.

This declining trajectory, however, is not set in stone. There is still time to identify the barriers that have stalled our own progress—causing us to fall to 16th in the world in the percentage of young adults earning college degrees—and then to implement new strategies to boost performance and develop our next generation of innovators, entrepreneurs, and skilled workers.

To maintain our economic position, the United States must commit to an ambitious economic strategy that invests in our children and families. American policymakers must learn from our own historical experience while also gaining insight from successful policy initiatives abroad. There is ample evidence in both contexts—domestic and international—to identify policies that will enable the United States to develop the world's most competitive workforce and maintain its global leadership position.

The first source of evidence is the success of our own middle-class and high-income families. These families have established a common pattern of practices that have resulted in decades of educational gains and successful employment outcomes. These practices include:

- Enrollment in early childhood education
- Parental involvement in the classroom
- Rich learning environments in the home
- Teenage work experience

The second source of evidence is the success of policies and programs in developed countries across the Atlantic. In many cases, countries

in Europe and Scandinavia have instituted policies in response to the same economic challenges facing the American workforce. Successful initiatives to improve competitiveness—implemented by highperforming nations such as Finland, Germany, and the United Kingdom—should serve as “best practices” for our policymakers here at home. Some of these best practices focus on:

- Alleviation of child poverty
- Pro-family workplace policies
- Education reform

This chapter will highlight the wide disparities in educational and employment outcomes in our nation—disparities that are closely linked to socioeconomic differences. One of the keys to increasing the competitiveness of our workforce will be to expand important opportunities and advantages that have been long enjoyed by middle class and high-income families to children in low-income families as well. As countries such as China and India

send tens of millions of students to college, it will no longer be possible for the United States to maintain such large advantages in educational and employment outcomes and still be competitive in the global economy.

At the same time, it is also important to improve educational and economic outcomes across all socioeconomic tiers. The global economy has created an increasingly competitive marketplace for American workers in all industries and at all skill levels. Our future competitiveness will depend on our ability to stay among the world’s top performers.

Any effort to develop an ambitious U.S. economic strategy should reflect an analysis of successful domestic policies and international best practices. These policies and practices offer compelling evidence that investing in education and human capital development—particularly through children and young adults—is the key to maintaining the world’s most innovative, productive, and competitive workforce.

Insights from America’s middle class and high-income families

It should be no surprise that children from middle class and high-income families tend to exhibit better educational outcomes—and greater economic success, overall—than children from low-income families. Children from middle-class and high-income families, for instance,

have much higher rates of college graduation and employment and also realize higher earnings throughout their lives. The body of research that supports the relationship between a family’s socioeconomic status and children’s outcomes in education and life is well established.

Data from the 1997 National Longitudinal Survey of Youth helps to understand these factors by tracking how various individual, family, and community experiences relate to individual outcomes in school and later in adulthood.¹⁹³ The survey catalogues a variety of behaviors and characteristics of approximately 9,000 youth and their parents, siblings, and children since 1997. At the start of the survey the youth were between 12 and 16 years old. (We discuss the data, methodology, and assumptions further in the Appendix on page 86.)

Middle class is defined as households with total annual earnings ranging from 50 percent below median household earnings to 200 percent above median household earnings, which translates to earnings ranging from \$26,035 to \$104,140 in 2010 dollars.¹⁹⁴ Those households falling below this range, or reporting negative earnings, are defined as low income, while those above the range are defined as high income. Among families in the survey, 26.3 percent ranked as low income, 57.6 percent as middle class, and 16.1 percent as high income. Middle-class households, on average, had annual earnings of \$60,005, while low-income households had earnings of \$13,031 and high-income households averaged \$162,868.¹⁹⁵

Household earnings are associated with success

Across a wide range of educational and employment outcomes, youth from middle-class and high-income families outperform youth from low-income families by a substantial margin.

Middle-class and high-income youth graduate from high school at 1.3, to 1.5 times the rate, respectively, of low-income youth. And they graduate from college at 3 to 5.9 times the rate of low-income youth. (see Table 4)

TABLE 4
Family incomes are important to educational success

Success rates, by percentage, in education based on family income levels

Success outcomes	Low income	Middle class	High income
Graduated high school	58.8%	79.2%	89.7%
Graduated college	7.6%	22.7%	44.8%
Employed at 25	70.8%	81.6%	86.1%
Earnings at 25	\$21,264	\$29,371	\$36,972
Health benefits at 25	27.8%	45.6%	57.9%

Source: Analysis of National Longitudinal Survey of Youth, 1997.

Beyond these educational achievement gaps, youth from middle-class and high-income families also have more success as they transition into the labor market. Young adults from middle-class families are 15 percent more likely to be employed at age 25 than their peers from low-income families, while young adults from high-income families are 22 percent more likely to be employed.

Young adults from middle-class and high-income families are also employed at better jobs. At age 25 young adults from middle-class families, on average, earn \$8,100 more than

their peers from low-income families, while young adults from high-income families earn \$15,700 more than young adults from low-income families. And young adults from middle-class families are 64 percent more likely to hold a job at age 25 with employer-sponsored health benefits, while young adults from high-income families are more than twice as likely to have employer-sponsored health care.

TABLE 5
Family life is important to educational success

Positive educational efforts in the home, by income levels

Inputs to youth development	Low income	Middle class	High income
Child care, age 4	22.6%	36.1%	43.4%
Enriching home environment (index score)	140.0%	180.0%	230.0%
Parents volunteered in classroom	36.0%	51.8%	67.9%
Teenage work experience	20.9%	25.9%	28.3%

Source: Analysis of National Longitudinal Survey of Youth, 1997.

Household earnings are also linked to different practices and opportunities

The evidence is conclusive that total income in a child’s household is the single most important factor in predicting long-term success.¹⁹⁶ Higher-income parents are simply more able to provide advantages to their children that extend beyond inherited biological characteristics or the parents’ education levels.¹⁹⁷

But beyond differences in income, families across different income groups also engage in a variety of important practices that support the development of their children—ranging from early learning opportunities through transitions to adulthood. (see Table 5)

The data illustrate that middle-class and high-income families are much more likely to enroll their children in early childhood education, volunteer in the classroom, provide a rich learning environment at home, and support teenage work experience. Children from low-income families—perhaps due to their parents’ limited economic or educational resources, or lack of workplace advantages—are much less likely to benefit from these practices.

In addition to broad differences across income groups, benefits associated with these key practices are consistent within these three income groups as well. In other words, children in low-income families who receive these benefits experience better outcomes than children in low-income families who do not. The same holds true for children in middle-class and high-income families. This result indicates that if more children were offered these opportunities, their long-term outcomes would likely improve accordingly. So let’s look at each of these experiences in a bit more detail.

Early childhood learning and education

Survey data show that significantly higher percentages of children in middle-class and high-income families participated in child care. At age 4, approximately 36 percent of children in middle-class families and 43 percent of children

in high-income families attended child care, compared with 23 percent of children in low-income families.

And the results?

The data clearly shows that child care is associated with educational and employment success later in life. Twenty-nine percent of children who received child care went on to graduate from college, compared with 24 percent of children who did not receive child care. Moreover, 82 percent of children who received child care were employed at age 25, compared with 79 percent of children who did not. And based on participation rates, children from middle-class and high-income families were more likely to reap the long-term benefits of child care.

Parental involvement and enrichment of the development environment

Children with parents or other adults who are actively involved in development activities also receive an early advantage. The data again show that middle-class and high-income parents are more likely to engage in activities to create development opportunities for their children. Fifty-two percent of children in middle class families and 68 percent of children in high-income families had parents who volunteered in the classroom, compared with only 36 percent of children in low-income families.

The survey also measures qualities that make a home conducive to learning and development, including measurements of an “enriching environment index” and a “home risk

index.”¹⁹⁸ Both measures have been shown to predict health and behavioral benefits related to youth development.

The enriching environment index measures whether homes have computers, dictionaries or a quiet place for children to study, as well as whether children participated in extracurricular activities such as music, art, or foreign language classes. Overall, it combines three measures of the quality and extent of stimulation to child cognitive development. The enrichment index measures the home environment on a scale of 0 to 3, where a high enrichment score reflects a home situation more conducive to youth development. Homes of children in middle-class families, on average, received a score of 1.8 while homes of children in high-income families received a score of 2.3. Homes of children in low-income families received an average score of 1.4.

In contrast, the home risk index measures factors that might negatively affect early adolescent. Overall, the risk index captures 30 measures addressing physical and emotional safety in the neighborhood and home, substance abuse or mental or physical disabilities in the home, religious participation and parental supportiveness and engagement in child rearing. Individual measures are factored into a score ranging from 0 to 21, with higher scores reflecting a riskier environment for youth. Children from middle-class and high-income families faced average risk scores of 2.4 and 1.6, respectively, while children from low-income families faced the riskiest environment with average scores of 3.7.

The results of parent involvement and enrichment are equally telling as the early child care results. Parents who volunteer to help in the classroom and who provide a more enriching home environment have children that exhibit better educational outcomes and labor market success in early adulthood. These practices are associated with better aptitude test scores, college degree attainment, employment, earnings, and nonincome benefits such as health care and retirement benefits. (see Table 6)

Teenage work experience

Evidence also suggests that early work experience—and the initial socialization and skills development that come with it—provides valuable long-term benefits. Once again, the data show similar patterns where children from middle-class and high-income families disproportionately benefit from these experiential learning opportunities. The results are consistent for a variety of work-related experiences, including job shadowing programs, apprentice-

ships and internships, and independent work during teenage years. The data show that youth from middle-class and high-income families were significantly more likely to participate in work-related activities that offer preparation for success later in life. (see Table 7)

School-to-work programs that introduce youth to the workplace are strongly correlated to better educational and labor market outcomes, even after accounting for differences in household income. This relationship is consistent across all respondents. Middle-class and high-income youth, however, show a higher probability of participating in these programs, although data also suggest that some low-income youth face obstacles to participation because their schools may not offer such programs. Whatever the case, the data show that youth who participate in teenage work experiences exhibit more long-term success with college graduation rates, employment rates, earnings, and benefits in early adulthood. (see Table 8)

The benefits of educational practices among America's middle-class and high-income families

The analysis suggests that the time-tested practices of middle-class and high-income American families provide valuable lessons about successful child development. These practices demonstrate that investing in children and young adults—through early childhood education, parental involvement

in the classroom, a rich learning environment in the home, and opportunities for teenagers to gain valuable work experience—leads to greater educational attainment and better labor market outcomes. Thus, public policy that allows all children to benefit from these experiences would likely improve the qual-

TABLE 6

The benefits of good parenting

A selection of outcomes based on parent classroom volunteering and an enriched home environment

Input	Outcomes					
	Standardized math test scores	College degree	Employed at 25	Earnings at 25	Health benefits	Retirement benefits
Parents volunteered in the classroom						
Yes	102	34%	83%	31,355	49%	32%
No	96	18%	77%	27,842	39%	25%
Enriching home environment						
Yes	103	34%	83%	\$31,903	49%	33%
No	93	10%	73%	\$24,523	30%	21%

Source: Analysis of National Longitudinal Survey of Youth, 1997.

TABLE 7

The teen work experience

The percent of participation in different teen employment options, by income group

Input	Income Group		
	Low-income	Middle class	High-income
Job shadowing	20.9%	25.9%	28.3%
Internship/apprenticeship	10.9	13.6	16.8
Teenage employment	68.0	75.2	78.8

Source: Analysis of National Longitudinal Survey of Youth, 1997.

TABLE 8

The benefits of teen work experience

A selection of outcomes based on teen work experience

Input	Outcomes				
	College degree	Employed at 25	Earnings at 25	Health benefits	Retirement benefits
Teenage work experience	38%	84%	\$33,965	52%	35%
No work experience	24%	79%	\$28,702	42%	27%

Source: Analysis of National Longitudinal Survey of Youth, 1997.

ity of our nation’s stock of human capital. But learning from our own experience is only part of the solution. Another source of inspiration

for boosting American competitiveness comes from analyzing successful initiatives in other developed countries.

Best practices in European countries

Europe’s 10 largest nations have a combined gross domestic product that accounts for 90 percent of the European Union’s GDP, which is roughly comparable to U.S. GDP.¹⁹⁹ The countries include Belgium, France, Germany, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom. Like

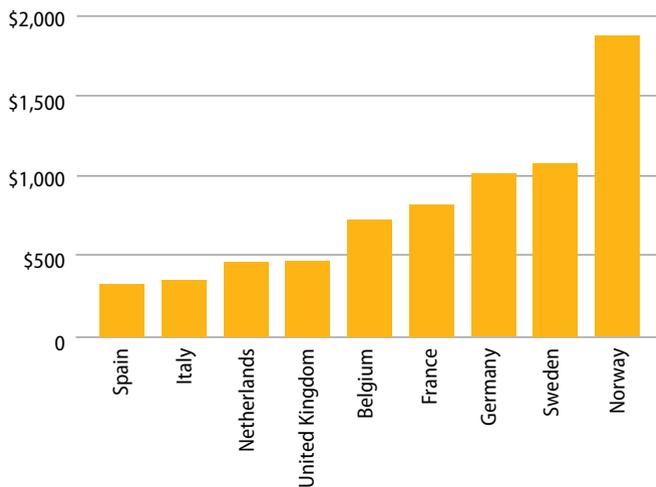
China and India, major European countries are making significant investments in families and children while simultaneously reforming their education systems.

The good news is that successful strategies in Europe offer the United States ready-made “best practices” that can be replicated or modified to address our own challenges. These strategies focus on reducing child poverty, increasing parental ability to support and care for children, and boosting student achievement. Let’s look at each in turn.

FIGURE 8

Family benefit levels in Europe

Estimated per capita cash, tax and other benefits for families to address cost of parenting, 2009



Source: Eurostate, Social statistics, Social Protections Tables, 2009

Child poverty policies

Students who grow up in poverty are less likely to do well in school and more likely to enter the workforce with diminished skills. Boosting income alone will not miraculously increase the skills of these students. But income supports—combined with other family-friendly policies—can improve the likelihood of long-term success.²⁰⁰

Each of the nations listed above has a lower child poverty rate than the United States. Even

The difference between how Europe and the U.S. measure poverty

When comparing child poverty rates across Europe, we must rely on the European standard for poverty, which is defined as a household with total income at or below 60 percent of the median income. The U.S. standard for poverty, meanwhile, is set by federal agencies based on a complex

analysis of the minimum income needed to purchase basic necessities. It is not linked to income levels of the general population. The U.S. poverty level for a family of 3, for instance, is \$17,522—or about 28 percent below the median income in 2011.

Based on our definition, approximately 7 million American families with children are living in poverty. If we adopted the more expansive European definition of poverty, that figure would increase to approximately 10.7 million American families with children.

France and the United Kingdom—large and diverse nations with relatively high poverty rates by European standards—have child poverty rates only half the level of the United States. (see above sidebar)

So what accounts for the low child poverty rate of European nations? One answer is that these 10 nations reduce their overall poverty rate by one-half through government support for families, such as:

- Paid maternity leave
- Other paid parental leave
- Cash allowances for children
- Child care subsidies²⁰¹

All 10 of these countries make all these income transfers to their families with children, although some funnel more resources to lower-income parents. The United States, in contrast, offers some of these income transfers to low-income and working poor families, but they are far less generous and, as

a result, only reduce the U.S. poverty rate by less than one-third.²⁰²

Government-directed cash payments and tax breaks for families to offset the cost of raising children are provided by each European country cited. Norway provides the most generous benefits—spending \$1,877 per capita to provide financial assistance to working parents—while Italy provides the least generous benefits at \$364 per capita.²⁰³ (see Figure 8)

Pro-family workplace policies

European governments also support policies that recognize the income benefits of households with dual wage earners. And even in the case of single parents, these governments support policies that make it possible for them to provide nurturing care for their children without having to leave the labor force. The result is that children are less poor and do better in school.

To support effective childrearing while maintaining higher levels of women in the workforce, European governments implement a suite of policies that make work and responsible parenting possible. Some of these policies are the same ones used to alleviate child poverty—such as affordable child care and paid parental leave—but other policies include legal protections to ensure that parents who temporarily leave the workforce can reenter it with ease and limited income losses.

a month of paternal leave, with half of it paid.²⁰⁴ Germany offers approximately three years of maternal leave—including 10 months paid—while also providing two months of paternal leave, one of them paid. The United Kingdom, for its part, provides working mothers with 13 months of paid maternal leave.

While the length of leave and whether the policies also apply to men varies among European countries, there is evidence that all forms of paid parental leave boost the employment rates of women.²⁰⁵ While studies show that extremely long maternity leave has a negative effect, the overwhelming consensus is that maternity leave makes women more likely to return to work. The result is that fewer children live in poverty.²⁰⁶

Overall, the European combination of income support and paid parental leave policies has led to a significantly lower child poverty rate. These social policies have also worked in coordination with education reform policies to boost student achievement.

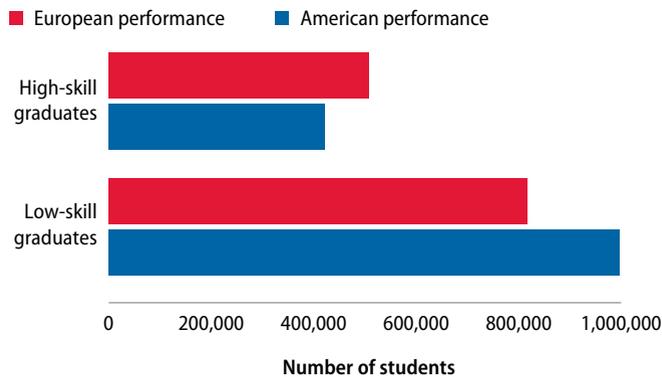
Education reforms

To put the European education system into context, the 10 European countries we analyzed have approximately the same number of students per grade as the United States. But European students, on average, score higher on math, science, and reading proficiency tests than their American counterparts.²⁰⁷ European countries also boast a larger share of students who score highly on standardized

FIGURE 9

European students best their American students in math

Comparison of U.S. and European student math skills: Very high and very low skills, 2009



Source: author's calculations based on 2009 PISA results, PISA 2009 Results: Learning Trends: Changes in Student Performance Since 2000 (Volume 5)

In Finland, a Scandinavian country with similar social policies as the leading European countries, working mothers are guaranteed up to 11 months of maternal leave—including seven months of paid leave. And working fathers get

tests, along with a smaller share of students who do poorly. (see Figure 9)

Three countries serve as models for our own set of recommendations in this report yes. Each of them—Finland, Germany, and the United Kingdom—employs a different strategy to boost student success:

- Finland initiated reforms in the late 1970s and now its students consistently outperform all other western countries in math, science, and reading.
- Germany initiated more recent reforms that have led to a significant increase in performance in math and reading proficiency.
- The United Kingdom, facing similar challenges to the United States, is currently employing a long-term approach that research and preliminary evidence indicates will boost achievement—particularly among students in low-income families.

We will now take a more detailed look at each of these programs.

Finland

Since the Program of International Student Assessment was introduced in 2000, Finland has consistently outperformed all other European and North American countries in math, science, and reading proficiency. Finland also has the highest percentage of students performing at the highest levels, and the lowest percentage of students with poor math, science, or reading skills.

Finland’s successful strategy boils down to this: It’s all about the teachers. Over the last 40 years, Finland’s core education strategy has been to increase the caliber of its teachers and to give them greater autonomy in the classroom.²⁰⁸ Finland accomplished its goal by encouraging top students to become teachers and by shifting teacher training programs to top-tier universities.

Becoming a teacher in Finland is difficult. Applicants must have stellar high school grades and achieve high scores on the national college entrance exam. Then they must pass a rigorous pedagogy exam and also be observed and rated by professionals according to their social interaction and professional skills. Finally, applicants must sit for interviews with faculty.²⁰⁹

Schools of education are required to be so selective that only 1 in 10 applying is accepted.²¹⁰

By contrast, schools of education in the United States have much lower standards for admission. According to Mark Tucker of the National Center on Education and the Economy, “College Board data for 2008 show that high school graduates who indicated that they intended to major in education on average scored in the bottom third on the SATs.” This reflects the often-heard quip from American youth: “Those who can’t do, teach.”

Surprisingly, Finland does not provide top-level teacher salaries to attract the best and the brightest to the profession. Instead, Finland recruits its teachers by offering a high level of trust, intellectual challenges, the satisfaction

of being admitted to an exclusive profession, the opportunity to work with talented peers, and a substantial amount of professional autonomy.²¹¹

Finland's teacher-preparation program is extremely rigorous.²¹² All teachers are required to earn a master's degree, but unlike in the American system, teacher preparation programs focus on gaining expertise in subject-matter content:

- Every teacher must learn core content—including reading, math, science, and history—in the academic departments that specialize in those subjects. Within the academic disciplines, teachers are given pedagogy classes to learn how to teach the content. This is a marked departure from the American model, in which education majors often receive their subject-matter content instruction within the schools of education.
- Every Finnish teacher must write an academic dissertation on some aspect of pedagogy. This high-level expectation develops the teacher's ability to reflect on teaching practice and hone her understanding of good teaching methods.
- While taking college courses, all Finnish education students are mentored and get hands-on training at a "training school" situated near every school of education.
- Every teacher practices teaching for a full academic year to complete a master's degree. During the practice year, small groups of practicing teachers continue to work with

university faculty to identify and solve classroom or curricula challenges.

In addition to setting a high bar for admittance into the teaching profession, along with rigorous training programs, Finnish teachers have an extraordinarily high level of instructional autonomy. They spend 40 percent less time in a classroom setting per year than their U.S. counterparts. In their nonteaching hours, Finnish teachers select their textbooks and plan their teaching approach, including the sequencing of content and methods for teaching. Teachers also select from a battery of assessments and diagnostic tools to provide on-going feedback on the progress of student learning.

The results speak for themselves. When Finland initiated these reforms a few decades ago, only 30 percent of students graduated from high school. Today over 80 percent graduate from high school. These educational gains are also translating into rising rates of college enrollment. Forty percent of all Finnish high school graduates attended college in 2007—more than twice the share of graduates who attended college two decades earlier. In addition, a large cohort of high school graduates attends polytechnic institutes, bringing the share of students enrolled in postsecondary education to approximately 65 percent.²¹³

Finland's successful education reforms have made it possible to shift away from a reliance on the forestry and metal sectors to a rapid expansion of information technology and research sectors. From the early 1990s through 2003, Finland was one of the leading countries

in the world in terms of annual growth rate and share of gross domestic expenditure on research and development.²¹⁴

Germany

Germany was “shocked” by the first Program of International Student Assessment results in 2000, which indicated very weak skill levels among German students and evidence of unexpectedly large variations in performance.²¹⁵ But German policymakers responded by initiating significant education reforms that are delivering much better results. Since receiving those initial results, German students have made the largest gains of any European or North American country in reading proficiency—and, since 2003, the same is also true for math skills.²¹⁶

Germany’s increase in math achievement from 2003 to 2009 makes it the most improved nation among all Western countries. The average German student improved by 10 points in that period, while the average American student’s score grew by only 5 points. By 2009, 17 percent of German students could do advanced level math, compared with just 10 percent of U.S. students.

How did Germany accomplish this rapid improvement? By making education reform a federal priority and linking it to the workplace. As with the 50 U.S. states, German states—known as *Landers*—are chiefly responsible for the administration and outcomes of public education. Before 2000, federal intrusion into educational content and structure was culturally *verboten*. But within three years of initial

Program of International Student Assessment results, a high level federal commission of experts completed a set of national education standards for grades kindergarten through 12th grade for all major subjects.

“ Germany’s increase in math achievement from 2003 to 2009 makes it the most improved nation among all Western countries, with the average German student improving by 10 points.

Germany began in 2006 to administer national assessments aimed at measuring student learning. The following year, Germany established final high school standards for German, French, English, math, biology, chemistry, and physics. The rapid pace of federalizing national education standards and assessments was testament to Germany’s determination to boost student achievement. Some critics maintain, however, that the standards are not clear enough, and that they are not being adopted in ways that will promote better teaching.²¹⁷ (see sidebar on following page)

Other large reforms may also have contributed to Germany’s educational gains during this period. In 2003, for example, the federal government announced a multi-billion Euro plan to expand full day schooling across

The difference between how Germany and the United States responded to disappointing test results

Germany's strong federal response to the first test results in 2000 stands in marked contrast to the American response. In the United States, it took nine years for states to agree to work together to create common education standards. Twelve years later, 45 states today have adopted these common standards—but some states are beginning to get cold feet.

In April of this year, *Education Week* reported that in the United States, “questions about the federal government’s role have rippled through a few state legislatures, where lawmakers are just beginning to examine the ramifications of adoption decisions made by their state boards of education. Such bills have called for repeal of the

standards adoptions, or for keeping a close watch on their implementation.”²¹⁹

The tough next step in the United States is to create a useful and aligned assessment system for teachers to gauge student learning. Development is underway but the system is at least two years away from being ready.

the country. At the time, about 95 percent of German schools scheduled classes from around 8:00 a.m. to 1:00 p.m. Slightly more than half of schools today offer a full day of instruction and enrichment activities expanding the typical school day from five hours to at least seven hours—a 40 percent increase in learning time.²¹⁸

Although unrelated to the German “PISA Shock” reforms, another successful German education approach to boosting its workforce skills is the “dual education system.” In this system approximately 60 percent of German students, nearly 2 million in total, participate in a three-year apprenticeship training program in one of more than 400 certified occupations, ranging from carpentry to information technology to allied health professions.²²⁰ This large-scale public-private education model combines academic learning and on-the-job training while helping to close the skills gap for

many young students. It also leads to higher levels of youth employment.

Under the German system, students alternate between classroom theory, provided by the public education system, and hands-on applied learning with a private employer. The dual system’s intimate connection to private employers is the primary reason for Germany’s relatively low youth unemployment rate, which is well below the European Union average.²²¹

While so-called voc-tech training is often stigmatized in the United States,²²² nearly two-thirds of German students choose it, and it continues to enjoy high status and impressive outcomes. The dual system also accounts for Germany’s exemplary high school graduation rate of 84 percent. More students graduate from the dual system, in fact, than from Germany’s college prep high schools.²²³

One of the attractions of the dual system is that students are paid stipends for the portion of the school week spent in the workplace. Some critics of this education model, however, worry that paid stipends might induce talented students to forego the traditional college-bound track—and it may help to explain why only 35 percent of German students enroll in college. Yet recent reforms are contributing to small increases in the number of students who graduate with dual degree certificates and go to college.

The successful track record of Germany’s “dual education system” suggests that certain elements could be adopted in the American system as well. Already, India is proposing to pilot the dual system as a means of creating a higher quality and more employer-driven vocational education model.²²⁴ While some of the dual system’s success is related to Germany’s deep-rooted culture—along with its strong tripartite relationship between labor unions, trade associations, and the government—there are potential insights for U.S. policymakers to learn about public-private partnerships and the value of applied learning models.

The United Kingdom

The United Kingdom and the United States share a common history and a common language. Unfortunately, we also share relatively poor Program of International Student Assessment results. Similar to their American counterparts, British students have much lower average scores than students from the Nordic and high-performing Asian countries on international math, science, and reading proficiency assessments.

The United Kingdom, however, has outperformed the United States by having a higher share of students who excel and a lower share of students with poor skills. But Britain intends to do even better, by focusing attention on the growing social isolation among Britain’s poorest families and emphasizing family support services and early childhood education as the solution.

Twelve years ago the British government committed to providing free preschool classes to every child. And it has delivered on that promise. Now every child between the ages of 3 and 5—slightly more than a million children altogether—is enrolled in an early childhood program for 15 hours per week for the full school year. Programs are based on a national curriculum, with national standards for high quality programs, and every program undergoes a rigorous national review at least once every three years.²²⁵

A longitudinal analysis of the initial impact of early childhood programs, conducted 10 years later, found that 14-year-old students who attended high-quality early learning programs had stronger math and science skills and more appropriate social and behavioral skills than those who did not.²²⁶ The study also found that high-quality early childhood programs were particularly effective in compensating for weaknesses in home learning environments. What is particularly instructive about this study is that poorer quality learning programs had very limited results while higher quality programs demonstrated lasting gains.²²⁷

Implementing a universal early learning program, by itself, sets Britain apart from most of

its European and North American peers. But Britain didn't stop there. The government also developed what is considered one of the most innovative early childhood and family support models in the world.²²⁸ It provides

- **One door for all family support systems.** The government integrated services so that families can go to one place in their community to access a full spectrum of family support services to fulfill the explicit goal of boosting child wellness and learning.
- **Early intervention.** The government enhanced access to support services for parents of children from birth to age three. It also offers transition services as needed until children turn six.
- **National standards and inspections.** The federal government played a major role in defining the standards for its early learning system and annually measures every program for adherence to those standards.²²⁹

This system developed after British policymakers took seriously the compelling research that shows the impact of high-quality early childhood programs.²³⁰ The research led them to target the new British model to children, parents, and the general community—not just to individual children in low-income families, as is common in U.S. programs.²³¹

The new federal team worked in partnership with local government, parents, and private providers to design a parent-friendly and community-based model of “children’s centers,”

operated under the aegis of local government by newly formed “children’s trusts.” The new system stretched the traditional vision of children’s services in many ways, most profoundly by recognizing that services need to be available to families at birth. As a result, these new centers offer a one-stop shop for the full array of early childhood services that families need to promote healthy development of children, from birth to 6 years old.

The children’s centers also break from traditional means-tested access rules that historically stigmatize such programs. The centers are located in low-income communities, but families of all income levels are eligible for services. And early evaluations show that most of the families who use the services have incomes above the poverty level.²³²

These children’s centers are designed to improve a child’s social and emotional development, health, and ability to learn. They are also expected to strengthen family function and community support for healthy families. And these goals are rigorous. Each center is expected to achieve specific outcomes, hit interim targets, and conduct comprehensive planning to demonstrate viable strategies to meet these targets.²³³

The results suggest that children’s centers are already having a positive impact. Longitudinal studies released in 2008 and 2010 found

- Improved child social behavior
- Improved self-regulation and independent learning skills

- Less hard discipline from parents and lower levels of home chaos
- More home settings that are conducive to learning

These findings are consistent for single parents, teen parents, and unemployed households.²³⁴ In spite of early childhood education's place as a relatively new federal policy, the Economist Intelligence Institute Starting Well Index ranked the United Kingdom's early childhood education system third in the world for quality, while the United States was ranked 22nd.²³⁵

To reach this preliminary level of success, the U.K. government made a four-fold increase in its investment in early childhood services from 1997 to 2007. It now spends approximately \$3.1 billion annually on these programs to support the current system of 3,500 children's centers across the country.²³⁶ Overall it is a good example of a country implementing an ambitious economic plan to boost national competitiveness by investing in children and families.

Conclusion

The practices of both middle-class and upper-income families in the United States and of successful countries in Europe are good places to look for comprehensive policies that could improve the quality of educational and economic outcomes in the United States. The countries examined in this section all faced lackluster student academic performance but responded by crafting unique and thoughtful strategies to boost their outcomes. While specific policies and initiatives differed, a number of traits are common to their efforts. Each country found a way to implement policies based on compelling lessons from research, and galvanize their public, private, and political resources in support of bold national strategies.

America has always risen to meet its great challenges. As we confront our current economic challenge—from China, India, and European rivals, as well—it is imperative that we use the best evidence at our disposal to develop solutions that meet the scale of our national needs.

Time-tested practices of America's middle-class and high-income families demonstrate that investing in children and young adults—through early childhood education, parental involvement in the classroom, a rich learning environment at home and opportunities for teenagers to gain valuable work experience—leads to greater educational attainment and better labor market outcomes.

Successful European initiatives show that national strategies to increase economic competitiveness—by reducing child poverty, increasing parental ability to support and care for children, and boosting student achievement—can lead

to rapid improvements in educational performance. Policymakers should use these examples as a blueprint for an ambitious American economic plan to increase educational attainment and improve our competitiveness.

Final conclusions and recommendations

Despite the varied nature of their efforts to prepare more young people for success in an increasingly competitive global marketplace, China, India, and several European countries are dramatically improving educational outcomes of their students. What they have in common is a new aggressive, determination to

- Set realistic, yet rigorous national education goals to prepare students for college and for the careers of tomorrow

- Improve teacher quality
- Invest in early learning and increase parental involvement

While U.S. policymakers would claim to have the same goals, America's approach has been far less ambitious. The time has come to change that. We need a renewed dedication to the goals for the sake of America's children and their role in the nation's future.

National goals

China and India are educating more of their citizens than ever before, improving educational outcomes, and ensuring that education will prepare them for jobs of the future. They are doing so by both ramping up investments and carefully investing in strategies that make it possible to see annual progress toward their goals.

Of course, China and India have a long way to go to reach many of the goals already attained by

the United States. But they and other countries are seeing the benefits of national standards. Germany, for example, which historically left education to its states, changed direction in recent years in response to poor international showings on the Program of International Student Assessment tests. Germany developed national education standards and held students to those standards, resulting in a significant increase in math achievement.

The United States has already long made a strong commitment to national education goals—embraced by both political parties and by all levels of government, starting with the 1989 National Education Summit led by President George H.W. Bush in partnership with the National Governors Association. Together, President Bush, governors, and Congress developed Goals 2000, which set lofty, but critical benchmarks, from early learning to college readiness, reviewed in Chapter 2.

While we have fallen far short of achieving these goals, the commitment to setting national education goals was revolutionary in itself, setting the path for two decades of work trying to improve education for all students. This effort culminated in the No Child Left Behind Act of 2001, a truly bipartisan piece of legislation, spearheaded by President George W. Bush with a strong partner in the late Sen. Edward Kennedy of Massachusetts (D). Through the new law, the president and Congress agreed that all students should be proficient in reading and in math by 2014.

Calling that “a utopian dream,” the Obama administration’s Secretary of Education, Arne Duncan, recognized that states could not meet the goal and so provided waivers to half the states, releasing them from penalties associated with falling short.²³⁷ Why such widespread potential failure? Fingers are pointing in many directions. Some critics accuse the federal government of never investing the federal dollars to make these goals possible. Others charge that a strict adherence to testing undermined student learning. And

still others charge that wide variation in state standards make the goals almost meaningless.

The good news is that, amid this din of debate about the successes and failures of the No Child Left Behind Act, 45 states have come together—again under the leadership of the National Governors Association and this time in partnership with the Council of Chief State School Officers—to commit to the Common Core Standards initiative. These standards outline the knowledge and skills that kindergarten-through-12th grade students need to graduate from high school and succeed in college or workforce training programs.

Common Core Standards, if sustained over time, could be a key component of the United States’s plan to invest in the next generation workforce, preparing students for success in college and the jobs of tomorrow. But the key is ensuring that the learning goals are translated into actual achievement. This will take improvements in classroom instruction.

We failed in our quest to be “first in the world in math and science by 2000.” A more realistic goal for the governors in 1989 would have been that U.S. schools improve in math and science at the same pace as the top improvers in the world.²³⁸ If we maintained such a pace for the next decade and a half, our math performance could potentially be in the top 10 of the world rankings, but only if other countries did not themselves improve.

Improving at the pace of the top performers in the world is possible. Our most improved

states over the past two decades have done this—Maryland, Florida, Delaware, and Massachusetts have improved at such a pace.²³⁹

The achievement gains that would come from replicating the performance of our best states would, by the analysis of implications on long-term growth, have dramatic consequences for

the future economic well-being of the United States. Indeed, if future growth follows the pattern observed over the past half century, the gains to the U.S. economy would be multiples of our current economic growth rates.²⁴⁰ The differences in economic outcomes from improvement in our schools compared with a complacent continuation of current policies cannot be ignored.

Train and sustain highly effective teachers

These standards and goals—like those before them—will not allow the United States to compete unless they lead to improved learning. As noted by long-time education advocate Jack Jennings, “the next round of reform must focus on the essentials of education—the quality of teaching and curriculum and the means of funding them.”²⁴¹ Studying the world’s highest performing schools, experts at McKinsey & Company conclude “the quality of an education system depends ultimately on the quality of its teachers.”²⁴²

As highlighted in our report, the investment in teachers in Finland—recruiting the best and brightest, providing rigorous teacher training, giving them professional respect and autonomy—did in fact lead to better student results. China is replicating this approach by dramatically increasing the number of teachers in the pipeline and recruiting more highly educated people to teach.

The moment to focus on better teacher quality may be at hand in the United States. The National Commission on Teaching and America’s Future predicts that in the next eight years, more than 1.5 million teachers will retire.²⁴³ Also, the political parties are moving closer together on standards of quality, calling for closer ties between teacher evaluations and student performance, and for reviews of teacher tenure practices.

Recent research shows that effective teachers have dramatic long-run effects on the future earnings of individuals and on the economy.²⁴⁴ A top teacher can increase the future incomes of her classroom of students by hundreds of thousands of dollars compared to an average teacher. The importance of having highly effective teachers indicates that much more aggressive policies toward training, recruiting, and evaluating teachers must be on the policy agenda.

Invest in early learning and increase parental involvement

Unlike national standards and teacher quality, agreement on investment in early education by both political parties has been elusive. Instead, as noted in the report, a powerful pre-kindergarten movement in the states has been weakened as a result of budget cuts. For now, President Obama and national Democrats have shown a greater willingness to invest more in early childhood education than Republicans.

By contrast, as our report shows, the United Kingdom not only provides pre-kindergarten to all 3- and 4-year-old children but also ties this early education to its national standards. Similarly, the Chinese have made large commitments to offer early education to as many as 70 percent of all three- and four-year-olds. The United States needs to view early childhood as

an investment, rather than a drain on state and federal coffers to ensure that our children can compete in school and beyond.

Parents are the other essential component. For their children to succeed, they need the time and workplace flexibility to monitor progress in school, provide care when a child is ill, and attend critical meetings with community partners. We know from our study of middle class households that children whose parents are involved in their child's school do much better in the classroom. The United States lags behind European countries, as well as China and India, in providing working parents the ability to ensure that parents can succeed at work while guiding their children's education.

The American educational challenge

While we understand much about how to improve schools, we have yet to figure out how to accomplish this improvement. Part of it is translating concepts into policies that are faithfully implemented. And part of it relates to having the political will to do it. The times of excitement and commitment to change,

which were evident at the first National Education Summit, have waned.

Yet there are very promising signs in the United States. Consider the commitment to Common Core national standards by almost all the states, the coming together on improv-

ing teacher quality, and at least a recognition by the states to the critical importance of early learning. These efforts, however, must come with a recommitment to invest in America's children and families. Our economic security and prosperity depend upon our greatest national asset—our children—being properly educated and prepared for the global workforce. We cannot abandon this commitment in a weak economy.

We believe the nation requires a new, laser-like focus on improving teacher effectiveness, ensuring that states can move forward with a national early education system, and integrating these efforts into the goals set with the Common Core standards. The best goals will

fall unfulfilled if we do not ensure that the teaching force is up to the task.

As a result, we strongly recommend that the president of the United States in 2013 convenes the nation's governors for a 2013 national summit on Building a Successful Education System in a Global Economy as a renewed effort at improving educational outcomes for the critical job needs of the years ahead. Only a renewed leadership on education as a national priority and real investments at all levels of government will enable the United States to remain economically competitive.

Our next generation depends on us renewing our commitment to excellence in education.

Appendix

In Chapter 5 of this report we analyzed data from the 1997 National Longitudinal Survey of Youth, or NLSY, to identify actions, behaviors, and opportunities associated with families at different levels of income that contribute to the education and development of children.²⁴⁵ These “inputs,” in turn, are also associated with a child’s success throughout their education career and their life beyond in adulthood and work. The National Longitudinal Survey of Youth is a nationally representative survey collecting detailed panel data on family background, education, and employment for approximately 9,000 youths and their parents, siblings, and children since 1997; at the start of the survey all youths were between 12 and 16 years of age.

Researchers at the U.S. Department of Labor have conducted the survey on an annual basis from 1997 to 2011. The analysis includes data for the first 13 rounds (1997 to 2009), for which data are publicly available.

The sample size of the survey includes 8,984 respondents ages 12 to 16 years by December 31, 1996 (ages 12 to 18 years at time of interview in survey round 1). By the thirteenth round in 2009, the number of respondents had dropped to 7,561. Due to missing observations, sample sizes may be smaller for a given variable in any year. The first round of the survey in 1997 also conducted a survey of parents, which collected data on parents’ education, income measures, and home environment.

Methodology

The analysis combines data on parental factors from the parent survey with childhood education factors from the youth surveys, and is divided into two steps. Step 1 identifies actions related to childhood education—taken by parents and youth—that may affect educational and post-education labor market outcomes.

The specific childhood education actions evaluated in the analysis were

- Attending child care
- Type of school attended
- Attending summer school to accelerate achievement

- Doing homework and hours spent on homework
- Early work experience
- Parental involvement in children’s educational experience, including through creating an enriching home environment

The analysis examines the variation across three income groups: low income, middle income, and high income, in order to establish middle-class norms.

Step 2 evaluates the association of these childhood education actions to educational outcomes and post-education labor market outcomes. Specifically the analysis evaluates how these actions are associated with student test scores, whether the students received training certificate and/or vocational license, and whether they progressed to higher education. The analysis also evaluates post-education labor market outcomes as measured by employment status, annual wage and salary earnings, and benefits at age 25 for respondents who were not at that time enrolled in higher education.

The National Longitudinal Survey of Youth oversamples certain population groups, so it becomes necessary to weight the raw data to yield results that are nationally representative. Our analysis employs the 1997 “cumulative case method” sampling weights that were used. These weights are preferred to panel weights for a single year or combined over multiple years because the former accounts for all respondents and does not create a selection bias.

We determined the highest degree received for respondents by survey round 13, in 2009, for all respondents. Because of attrition—youths initially included in the survey sample who dropped out of subsequent rounds of the survey—the highest-degree-received estimates overstate the percentage of respondents with no degree and understate the number of respondents with a college degree.

Alternatively, the highest degree received for the subsample of respondents who stayed in the survey all years or by year 2009 could have been used. This would overstate the percentage of college graduates, because respondents with a high school degree and less are more likely to drop out. Furthermore, it would result in loss of information, due to respondents with the correctly reported highest degree dropping out of the survey in later years. The approach taken in the analysis was to retain information when possible, and the highest degree for all respondents was used.

Post-education labor market outcomes were estimated at age 25. Because graduates with a degree, who continue in college or graduate school often will have lower earnings while in school, labor market outcomes were estimated for the subgroup of respondents who were not enrolled in a two-year college, a four-year college, grad school, or a professional program.

Assumptions

To evaluate the association of inputs and outcomes with family income levels, we

divide the population into categories of low income, middle class, and high income based on total household income. We define middle-class households as those respondents with household incomes in survey round 1 falling in the range of -50 percent to +200 percent of the unweighted sample median income. Low income is defined as household income less than 50 percent of the median income; and high income is defined as household income greater than 200 percent of the median income.

Respondents with negative household income were classified as low-income. The reported household income was determined from two questions in the National Longitudinal Survey of Youth. One question asked respondents about their dollar amount of income. In the cases where respondents refused to answer or did not know, they were asked a second question listing pre-defined income ranges. If no dollar amount was reported, the midpoint of the reported income range was used. Furthermore, incomes were top-coded at the top 2 percent. In the case of top coding, the top-coded value for that year was used, though the reported income may be higher than the top-coded value for some respondents who reported income range for which the midpoint was higher than the top-coded value.

The main educational outcome is highest degree received. For respondents dropping out of the survey, highest degree recorded was the highest degree while in survey. Therefore, highest degree may understate actual educational attainment of this subgroup (see previous section). The analysis also looks at test

scores for the math component of the Peabody Individual Achievement Test, or PIAT; verbal and math test scores for the Scholastic Aptitude Test, or SAT; and the combined score on the American College Test, or ACT. The PIAT math test was administered by the Bureau of Labor Statistics to respondents ages 15 years and younger, and scores ranged from 0 to 150. Reported scores did vary considerably from one year to the next for individual respondents who were tested multiple times.

In contrast, the SAT and ACT scores suffer from selection bias, as primarily students planning to enter college take it—those without the ambition or means to attend college are less likely to choose to take these tests. Moreover, the National Longitudinal Survey of Youth, did not report actual SAT and ACT test scores, but asked respondents to choose score ranges in 100 point increments, thus adding noise to the observation of test performance. Overall, PIAT math scores and the SAT math scores were only weakly correlated. The analysis looks at all test scores, but the main findings are reported specifically for the PIAT scores, because the PIAT test scores have a smaller selection bias. For respondents who took the test multiple times, scores at age 15 were selected.

We estimated and evaluated post-education labor market outcomes for subjects at age 25. Any given survey round was not completed within the survey year, and spilled over into the next year. For example, survey round six and seven each spanned 19 months, and overlapped with each other and survey round eight. As a result, some respondents were inter-

viewed twice at age 25. Moreover, because of irregularity in timing of the surveys, not all respondents in sample were interviewed while they were 25 years of age. Those respondents were coded as missing.

The National Longitudinal Survey of Youth, collects data on health insurance coverage, pension savings, and paid leave in survey rounds 9 to 13 (survey years 2005-2009). Employment status was determined for the second or third week in the month in which the respondent turned 25. Employment status considers combined participation in both the civilian and military labor force. Annual wage and salary earnings were also determined for the year in which the respondent turned 25. The survey asked respondents about annual earnings in the year prior to the survey year. We adjusted these earnings for inflation to 2010 dollars using the U.S. consumer price index research series, or CPI-U-RS.²⁴⁶

Finally, health care coverage, pension savings, and entitlement to paid leave were determined at the time of interview while age 25, using

the reported benefits for the interview closest to the 25th birthday year. Unfortunately, the sample sizes for paid leave were too small to generate meaningful results.

Other underlying assumptions—such as the type of school (public, private, or religious) that respondents were enrolled in—were determined as of December 1997. Homework was determined for the spring semester of 1997. The Bureau of Labor Statistics limited the subsample of asked questions about homework to respondents aged 12 to 14 years old as of December 31, 1996. So some respondents had turned 15 years by the spring 1997, and 16 years by the time of survey. Attending summer school was estimated for respondents aged 15 and younger for all prior school years. Finally, the analysis considers whether work experience in early teen years affected future labor market outcomes. The Bureau of Labor Statistics defined freelance work as jobs such as babysitting and mowing lawns, and the analysis looks at freelance work for the subsample respondents who were ages 12 to 16 at the beginning of survey.

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