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STRENGTHENING AMERICAN COMPETITIVENESS IN THE 21ST CENTURY

HEARING

OF THE

COMMITTEE ON HEALTH, EDUCATION, LABOR, AND PENSIONS,

UNITED STATES SENATE

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

ON

EXAMINING STRENGTHENING AMERICAN COMPETITIVENESS FOR THE 21ST CENTURY

MARCH 7, 2007

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STRENGTHENING AMERICAN COMPETITIVENESS IN THE 21ST CENTURY

WEDNESDAY, MARCH 7, 2007

U.S. SENATE
COMMITTEE ON HEALTH, EDUCATION, LABOR, AND PENSIONS
Washington, DC.

The committee met, pursuant to notice, at 9:34 a.m. in Room SH–216, Hart Senate Office Building, Hon. Edward Kennedy, chairman of the committee, presiding.

Present: Senators Kennedy [presiding], Dodd, Murray, Reed, Clinton, Sanders, Brown, Enzi, Gregg, Alexander, Burr, Isakson, Hatch, Roberts, and Allard.

OPENING STATEMENT OF SENATOR KENNEDY

The CHAIRMAN. We'll come to order.

I'll make a very brief opening statement, and then I'll recognize our friend, our colleague, our committee member, Senator Murray, who will have the honor of presenting our very distinguished witness here this morning.

I'm going to ask my colleague and friend, Senator Enzi, if he'd say a word of greeting, as well.

So, I welcome you here this morning, Mr. Gates. The committee is very pleased to have the opportunity to talk to you about the critical issues of America's competitiveness. We're eager to hear the insights you've gained through your leadership of the Microsoft Corporation and through your unparalleled philanthropic endeavors which have shed a light on the critical issues facing our families, the Nation, and the world.

You and your family are powerful advocates for the principle that all people need and deserve the opportunity to achieve their full potential, regardless of race, ethnic background, or financial means. In fact, today equal opportunity is more than a guiding principle for our Nation, it's essential to our strength and our prosperity, and we must make use of the skills and talents of every American to compete and win in today's competitive global economy. We should face the future not by lowering American wages, but by increasing American skills, to equip our citizens to compete and win in the global economy.

We've met these challenges before. We did it after the second World War, with the GI bill. And the GI bill equipped the Greatest Generation to build a new peacetime economy. We did it after the Sputnik launch, when we trained a new generation of Americans

in math and science. And we inspired millions more to greater and greater innovation when President Kennedy challenged us to send a man to the Moon. We can reach great heights of innovation yet again.

To meet these challenges, we must renew our commitment to education and job training, give our citizens the skill to spur innovation and progress, the No Child Left Behind Act, the Higher Education Act, the America Competes Act, the Workforce Investment Act, the Head Start Act. All of these matters are before this committee this year, and each one is vital to the innovation and competitiveness of our Nation.

To be globally competitive, we need to provide a world-class education to each and every student, and we must close the significant and shameful achievement gap that exists in this country. We must also do more to improve math and science instruction in our public schools, to encourage more young people to become scientists and engineers.

We passed the No Child Left Behind Act to tackle these issues. We're making progress, but we need to make changes to the law and make it work better for our schools and our children. And we need to provide the resources to support the reform.

Improving education is essential, but it alone isn't enough. We must strengthen our commitment to help workers adjust to the new economy, particularly those who lost their jobs due to trade and those who need training in the 21st-century skills. We must encourage innovation to support industries that will create the new jobs in the future.

When it comes to innovation, we must look beyond the horizon and chart the future. Mr. Gates, you have done that throughout your career. We're delighted to have you before our committee, and look forward to your testimony.

I'd ask Senator Enzi, if he would, to say a word, we'll go to Patty Murray, and then move on to your thoughts.

OPENING STATEMENT OF SENATOR ENZI

Senator ENZI. Mr. Chairman, I thank you for holding this hearing. I think it's at a particularly critical time, and Mr. Gates is an outstanding person to present.

This year marks 50 years since Sputnik went up, and that's the last time that we really had a huge turmoil in this country, worrying about engineering. It had a drastic effect on our system of education. It inspired people to be the best.

Since that time, of course, computers came along and stimulated us. I remember some of the early Radio Shack models that kids got to play with, and adults admired. And people were stimulated to write programs. Now, programs have gone to a whole different level from that time. And, in fact, I think one of the things kind of stymying kids is how far it has gone. How can they possibly do something as complicated as what's out there already? Of course, the game industry, kind of, came along, and that stimulated a few more to do some different things in the computer area. But somehow we've got to have the kind of a revolution that got the minds working in that new area of innovation. We've got to have more kids that are entrepreneurs and risk-takers.

And so, I admire you for what you've done, and you're a great symbol for the country and an inspiration to kids. Appreciate the effort that you're making through a lot of different programs with your Foundation to make that emphasis. Anything we can do to get some more risk-takers and entrepreneurs out there will make a difference. And, of course, we will have to rely on people from other countries and hope that they come here and become a part of the innovation that later moves to other countries or that becomes old technology.

So, thank you. I would ask that my full statement be included in the record.

The CHAIRMAN. All statements will be included in the record.

[The prepared statement of Senator Enzi follows:]

PREPARED STATEMENT OF SENATOR ENZI

Thank you, Senator Kennedy, for holding this hearing today. Employers of all sizes know that a skilled workforce is essential to being competitive in the global economy.

Our businesses must have the workers they will need to be competitive. Strengthening America's competitiveness requires that students and workers of all ages have the opportunity to gain the knowledge and the skills they will need to be successful throughout their lives, regardless of their background. Education and training are integral to meeting this goal.

A substantial portion of our workforce now finds itself in direct competition for jobs with highly motivated and often well-educated people from around the world. We can no longer afford to ignore that over the past 30 years, one country after another has surpassed us in the proportion of their entering workforce that has the equivalent of a high school diploma. We used to have the best-educated workforce in the world, but that is no longer true.

We must re-build, strengthen and maintain our educational pipeline, beginning in elementary school. We need to find ways to encourage high school students to stay in school and prepare for and enter high-skill fields such as math, science, engineering, health, technology and critical foreign languages. We must also strengthen the programs that encourage and enable citizens of all ages to enroll in postsecondary education institutions and obtain or improve knowledge and skills. The decisions we make about education and workforce development will have a dramatic impact on the economy and our society for a long time to come.

The present situation is discouraging. Every day in the United States, 7,000 students drop out of school. We must deal with the situation head on—we cannot allow students to "waste" their senior year, and graduate unprepared to enter postsecondary education and a workforce focused on skills and knowledge. Unless high schools are able to graduate their students at higher rates than the 68 to 70 percent they currently do, more than 12 million students will drop out during the course of the next decade. The result long term will be a loss to the Nation of $3 trillion, and as you can imagine, even more in terms of the quality of life for those dropouts.

To remain competitive in a global economy, we cannot afford to lose people because they do not have the education and training

they need to be successful. Thirty years ago the United States was proud to claim 30 percent of the world's population of college students. Today that proportion has fallen to 14 percent and is continuing to fall.

Demographics are responsible for some of this shift—keep in mind that if India alone educates just one-third of its population, it will have more educated people than the total population of the United States. We have control over whether we continue to let so many students fall through the cracks and out of the education and training pipeline.

To be successful in the 21st century economy we need to challenge our high school students more, increase high school graduation rates, reduce remedial education at the college level, increase student retention and completion rates for students in college, reduce barriers to adult worker participation in postsecondary education and training. Lifetime education and training is no longer an option, it is a necessity—for individuals, for employers and for the economy.

Innovation provides a way for individuals to create their own jobs or jobs for others. That is one of the primary reasons I began my annual free Inventors Conferences in Wyoming in 2004—to encourage and provide resources to individuals to impact the economy with their ideas. Too often, young people in Wyoming start thinking at too early an age that they will have to leave the State to find a good job. I offered another suggestion—create your own product—create your own job. That kind of mindset will encourage creativity and begin to tap the well of good ideas so many of our State's young people have to share. We can attract businesses, but we can grow our own new businesses too. Good ideas generate good jobs and that is something that will keep our kids at home and attract new businesses to our State.

I have had terrific role models, such as Dean Kamen, speak at my conference. I am hosting the Inventors Conference again in Wyoming this April. We need to encourage this kind of activity because America no longer holds the sole patent on innovation. Inspired by our example, countries such as China, India and South Korea have invested heavily in education, technology and research and development. Billions of new competitors are challenging America's economic leadership. In 2005, foreign-owned companies were a majority of the top 10 recipients of patents awarded by the U.S. Patent and Trademark Office.

In addition, we need to look at how we address immigration. Many people are concerned about illegal immigration and the impact legal immigration could have on their employment. Many employers have a need for trained and educated employees and are unable to fill these positions with domestic employees. The companies are often faced with the choice of hiring foreign workers or considering moving their operations overseas.

In the high-tech sector and across the Nation, I believe employers must be a partner in ensuring that employees are in the United States legally and holding the proper visas and work permit. It is clear, however, that the current system is not working. The complicated and overly burdensome process for visas and permanent

residency cards serves as a disincentive to both the employer and the employee.

Initial efforts have been taken to address the problems with the H-1B visa process and immigration in general but no final action has been set. Congress has considered legislation that specifically addresses foreign workers with masters or higher degrees from accredited U.S. universities to return or stay in the United States. I believe we should continue to work on this issue in the context of larger immigration reform as well in the context of our international competitiveness.

While we work to make our domestic workforce better trained to fill high-tech jobs, we must ensure that our high-tech companies remain in the United States.

We have our work cut out for us to meet the challenge of ensuring that America expands its competitive edge. We need a plan. We need to ensure opportunities are available to all Americans, because our future depends on widely available and extensive knowledge and training and a commitment to excellence. Strong partnerships and alignment among K–12 schools, institutions of higher education, business and government will help us meet the needs.

In the HELP Committee, we are using this opportunity to shape policy and strengthen the education and training pipeline. Through the reauthorization of Head Start, No Child Left Behind, the Higher Education Act and the Workforce Investment Act (WIA) we can make sure that every individual has access to a lifetime of education and training opportunities that provide the knowledge and skills they need to be successful and that our employers need to remain competitive.

As important as education is to the knowledge and skills of our workforce, I want to emphasize the need to reauthorize the Workforce Investment Act. It strengthens connections with economic development, links training to the skill needs of real jobs, and supports greater business engagement.

In a global economy where innovation and technology have created an increasing demand for skilled workers, access to training that prepares workers to meet these challenges is essential. The skills needed to keep current with the requirements of the 21st century workplace are changing at an ever increasing pace. Workforce development is not only hiring the right worker, but knowing how to help them keep current with escalating skill requirements and advances in their occupations. By helping low-wage workers advance in their jobs, entry level jobs will open up and more opportunities will be created. Our efforts in reauthorizing the Workforce Investment Act must ensure that it achieves this goal and is relevant to both employers and workers.

I look forward to hearing the contribution of our witness to this vital conversation.

The CHAIRMAN. Mr. Gates, if Senator Murray doesn't give you a good introduction, we'll make sure we find someone up here that will.

[Laughter.]

The CHAIRMAN. But we're confident that she will. As you well know, she's been one of the great voices in this institution and in

our country, in terms of supporting innovativeness and creativity and competitiveness.

Senator Murray, we're so glad to have you——

Senator MURRAY. Thank you, Chairman Kennedy.

The CHAIRMAN [continuing]. As well as our veterans, I might add.

Thank you.

STATEMENT OF SENATOR MURRAY

Senator MURRAY. Thank you.

Chairman Kennedy, Ranking Member Enzi, members of the committee, when it comes to making our country more competitive, improving our schools, and preparing our workforce, we face real challenges today. Those challenges require innovative solutions, and that's why I'm so pleased to welcome to the Senate one of the most innovative thinkers of our time, Bill Gates.

We all know about his work launching Microsoft, back in 1975, and turning it into one of America's most successful companies. Microsoft software is used here in the Senate, on most of the PCs around the world, and increasingly on servers, mobile phones, and broadband networks.

We're also familiar with his visionary work through the Bill and Melinda Gates Foundation, which has quickly become a global leader in the philanthropy, protecting and saving millions of lives around the world.

From my work with him over the years, I've seen firsthand his commitment to making our country more competitive. Over the years, he's tackled these issues from several perspectives. As the leader of a high-tech company, he's familiar with the challenges of finding highly skilled workers. He's supported educational programs and training partnerships with schools and the private sector. And he understands how technology can help move us toward a system of lifelong learning that reflects the reality of tomorrow's economy.

As the head of a major foundation, he's invested in education and workforce solutions in the United States and around the world. His analysis of our high school system has been provocative and thought-provoking. As someone who helped develop the tools of our knowledge economy, he's working to make sure that all Americans can benefit from the opportunities that technologies offer.

Personally, I can tell you he's done so much to support the economy and workers in my home State, where Microsoft and Gates Foundation are pillars of our community.

I am very pleased that he's agreed to share his insights with us here in the Senate today. And I really want to thank him for his leadership, vision, and eagerness to help us address the challenges that are facing our country.

Thank you very much.

And welcome to the Senate, Bill.

The CHAIRMAN. Mr. Gates, we have a rule about having our testimony from our witnesses, usually 24 hours. You have broken that rule. You got yours here a week ago.

[Laughter.]

The CHAIRMAN. And we thank you. It gives us an idea, again, of efficiency, and we thank you very much for—it's a very extensive testimony, let me add——

Mr. GATES. Thank you.

The CHAIRMAN [continuing]. And valuable.

Thank you.

Mr. GATES. Should I go ahead?

The CHAIRMAN. You may proceed.

Mr. GATES. Thank you.

STATEMENT OF BILL GATES, CHAIRMAN, MICROSOFT CORPORATION, SEATTLE, WASHINGTON

Mr. GATES. Well, thank you, Senator Murray, for that kind introduction and for your leadership on education and so many other issues that are important to Washington State and the Nation.

Chairman Kennedy, Ranking Member Enzi, members of the committee, I'm Bill Gates. I'm the chairman of Microsoft Corporation. I'm also a co-chair with my wife, Melinda, of the Bill and Melinda Gates Foundation. It's an honor for me to appear before you today and to share my thoughts on the future of American competitiveness.

Any discussion of competitiveness in the 21st century must begin by recognizing the central role that technology and innovation play in today's economy. The United States has a great deal to be proud of in this respect. Many of the most important advances in computing, healthcare, telecommunications, manufacturing, and many other fields have originated here in the United States. Yet, when I reflect on the state of American competitiveness, my feeling of pride is mixed with deep anxiety. Too often, it seems, we're content to live off the investments previous generations made and that we're failing to live up to our obligation to make the investments needed to make sure the United States remains competitive in the future. We know we must change course, but we have yet to take the necessary steps.

In my view, our economic future is in peril unless we take three important steps.

First, we must equip America's students and workers with the knowledge and skills they need to succeed in today's economy.

Second, we need to reform our immigration policies for high-skilled workers so that we can be sure our workforce includes the world's most talented people.

And third, we need to provide a foundation for future innovation by investing in new ideas, and providing the framework for capturing their value.

Today, I would like to address these three priorities.

First and foremost, the United States cannot maintain its economic leadership unless our workforce consists of people who have the knowledge and skills needed to drive innovation. The problem starts in our schools with the great failure taking place in our high schools.

Consider the following facts. The United States has one of the lowest high school graduation rates in the industrialized world. Three out of ten ninth-graders do not graduate on time. Nearly half of all African-American and Hispanic ninth-graders do not grad-

uate within 4 years. Of those who do graduate and continue on to college, nearly half have to take remedial courses on material they should have learned in high school.

Unless we transform the American high school, we'll limit the economic opportunity for millions of Americans. As a Nation, we should start with the goal of every child in the United States graduating from high school. To achieve this goal, we need to adopt more rigorous standards and set clear expectations. We must collect data that will enable students, parents, and teachers to improve performance. And if we are going to demand more from our students, we'll need to expect more from teachers. In turn, we must provide teachers the support they need, and we must be willing to reward those who excel. The Teacher Incentive Fund is an important first step.

Making these changes will be hard, but positive change is achievable. I know this through my work with the Gates Foundation and our education partnerships throughout the country, and through Microsoft's education initiatives, including in our Partners in Learning Program. I mentioned several examples of progress in my written testimony, but let me mention three, in particular.

The Philadelphia School District joined with Microsoft to create a 750-student School of the Future, which opened last September. This public high school is rooted in the vision of an empowered community where education is continuous, relevant, adaptive, and incorporates best-in-class technology in every area of learning.

Second, New York City has opened almost 200 new schools in the last 5 years, with many replacing the city's most underperforming schools. Our Foundation supports this effort through advocacy and grantmaking. The first set of new schools achieved an average 79-percent graduation rate, compared to graduate rates ranging from 31 to 51 percent at the schools they replaced.

Early-college high schools are perhaps the most innovative initiative underway nationally. The approach is to recruit low-performing students to attend high schools that require enrollment in college courses. The results are astounding. Currently, there are more than 125 early-college high schools in operation around the country. So far, more than 95 percent of the first class of ninth-graders of the original three early high schools have graduated, and over 80 percent of students have been accepted into 4-year colleges.

Such pockets of success are exciting, but they're just the start. Transforming our education system will take political leadership, broad public commitment, and hard work. This committee has done very important work in this regard. And, as you consider legislation during this Congress, there are opportunities to build on this work.

The challenges are great, but we cannot put them aside. That is why our Foundation has joined with the Broad Foundation to support the Strong American Schools Partnership. This is intended to inspire American people to join an effort that demands more from our leaders and educators on ensuring that our children benefit from good teachers, high expectations, and challenging coursework.

A specific area where we're failing is in math and science education. In my written testimony, I detail concerns about the alarm-

ing trends in elementary and secondary schools. We cannot sustain an economy based on innovation unless we have citizens well educated in math, science, and engineering. Our goal should be to double the number of science, technology, and mathematics graduates in the United States by 2015. This will require both funding and innovative ideas. We must renew and reinvigorate math and science curricula with engaging, relevant content.

For high schools, we should aim to recruit 10,000 new teachers and strengthen the skills of the existing teachers. To expand enrollment in postsecondary math and science programs, each year we should provide 25,000 new undergraduate scholarships and 5,000 graduate scholarships.

America's young people must come to see science and math degrees as key to opportunity. If we fail at this, we won't be able to compete in the global economy.

Even as we need to improve our schools and universities, we cannot lose sight of the need to upgrade the skills of people already in our workforce. Federal, State, and local governments and industry need to work together to prepare all of our workers for the jobs required in the knowledge economy. In the written testimony, I highlight some of Microsoft's work during the past decade to provide IT skills training to United States workers, such as our Unlimited Potential Program. We're working with other companies, industry associations, and State agencies to build a workforce alliance that will promote the digital skills needed to strengthen U.S. competitiveness.

As a Nation, our goal should be to ensure that, by 2010, every job-seeker in the U.S. workforce can access the education and training they need to succeed in the knowledge economy.

The second area I want to—one I want to particularly underscore today—is the need to attract top science and engineering talent from around the globe to study, live, and work in the United States. America's always done its best when we bring the best minds to our shores. Scientists, like Albert Einstein, were born abroad, but did great work here, because we welcomed them. The contributions of such powerful intellects has been vital to many of the great breakthroughs made here in America.

Now we face a critical shortage of scientific talent, and there's only one way to solve that crisis today. Open our doors to highly talented scientists and engineers who want to live, work, and pay taxes here. I cannot overstate the importance of overhauling our high-skilled immigration system. We have to welcome the great minds in this world, not shut them out of our country.

Unfortunately, our immigration policies are driving away the world's best and brightest, precisely when we need them the most. The fact is that the terrible shortfall in the visa supply for highly skilled scientists and engineers stems from visa policies that have not been updated in more than 15 years. We live in a different economy now, and it makes no sense to tell well-trained, highly-skilled individuals, many of whom are educated at our top universities, that they're not welcome here.

I see the negative effect of these policies every day at Microsoft. In my written testimony, I discuss some of the shortfalls of the current system.

For 2007, the supply of H-1B visas ran out 4 years before the fiscal year even began. For 2008, they will run out even earlier, well before degree candidates graduate. So, for the first time ever, we will not be able to seek H-1Bs for this year's graduating students. The wait times for green cards routinely reach 5 years, and are even longer for scientists and engineers from India and China, key recruiting grounds for skilled, technical professionals.

The question we must ask is, How do we create an immigration system that supports the innovation that drives American growth, economic opportunity, and prosperity? Congress can answer that question by acting immediately in two significant ways. First, we need to encourage the best students from abroad to enroll in our colleges and universities, and to remain here when they finish their studies. Today, we take exactly the opposite approach.

Second, we should expedite the path into our workforce and into permanent-resident status for highly-skilled workers. These employees are vital to American competitiveness, and we should encourage them to become permanent U.S. residents. They can drive innovation and economic growth alongside America's native-born talent.

Finally, maintaining American competitiveness requires that we invest in research and reward innovation. Our Nation's current economic leadership is a direct result of investments that previous generations made in scientific research, especially through public funding of projects in government and university research laboratories.

American companies have capitalized on these innovations, thanks to our world-class universities, innovative policies on technology transfer, and pro-investment tax rules. These policies have driven a surge in private-sector research and development.

While private-sector research and development is important, Federal research funding is vital. Unfortunately, while other countries and regions, such as China and the European Union, are increasing their public investment in R&D, Federal research spending in the United States is not keeping pace. To address this problem, I urge Congress to take action.

The Federal Government should increase funding for basic scientific research. Recent expansion of the research budgets at the Department of Energy and National Science Foundation is commendable, but more must be done. We should also increase funding for basic research by 10 percent annually for the next 7 years.

Second, Congress should increase and make permanent private-sector tax credits for R&D. The United States ranks 17th among OECD nations in the tax treatment of R&D. Without a renewed commitment to R&D tax credits, we may drive innovative companies to locate their R&D operations outside the United States.

We must also reward innovators. This means ensuring that inventors can obtain intellectual property protection for their innovations, and enforce those rights in the marketplace.

America is fortunate that our leaders recognize the importance of intellectual property protection at home and abroad. I know I join many other Americans in thanking this Congress and this Administration for their tireless efforts to promote such protection.

The challenges confronting Americans—America's competitiveness and technological leadership are among the greatest we have faced in our lifetime. I recognize that conquering these challenges will not be easy, but I firmly believe that, if we succeed, our efforts will pay rich dividends for all Americans. We've had the amazing good fortune to live through a period of incredible innovation and prosperity. The question before us today is, Do we have the will to ensure that the generation that follows will also enjoy the benefits that have come with economic leadership? We must not squander this opportunity to secure America's continued competitiveness and prosperity.

Thank you, again, for this opportunity to testify. I welcome your questions on these topics.

[The prepared statement of Mr. Gates follows:]

PREPARED STATEMENT OF BILL GATES

Chairman Kennedy, Ranking Member Enzi, honorable members of the committee, my name is Bill Gates and I am Chairman of Microsoft Corporation. I am also a co-chair, with my wife Melinda, of the Bill & Melinda Gates Foundation. It is an honor for me to appear before you today to share my thoughts on the future of American education, the development of our workforce, and other policies necessary to ensure America's continued competitiveness in the global economy.

Any discussion of competitiveness in the 21st century must, in my view, begin by recognizing the central role of technology and innovation. Having spent the last 30 years as the head of one of the world's leading software companies, I am continually astounded at the tremendous potential for technology to improve people's lives. My faith that technology can help transform lives has only been strengthened through my work with the Gates Foundation, which focuses on funding innovative solutions in health care and education in order to reduce inequities in the United States and around the world.

When it comes to innovation, America has a great deal of which to be proud. Many of the greatest advances in computing originated in America's research labs, public and private. These technologies have helped America achieve unprecedented gains in productivity and real wage growth.[1] American companies are global leaders in producing innovative pharmaceuticals, and our biotechnology industry is the envy of the world.[2]

In these and other areas—energy, transportation, telecommunications, financial services, manufacturing, agriculture, and many others—the achievements borne of American ingenuity and inventiveness have fueled unprecedented prosperity and improved the lives of people everywhere. America will need every ounce of this ingenuity as it confronts the challenges of this century: climate change, energy independence, national security, rising health care costs for an aging population, and the emergence of new innovative economies in Asia and elsewhere.

When I reflect on the State of American competitiveness today, my immediate feeling is not only one of pride, but also of deep anxiety. Too often, we as a society are sacrificing the long-term good of our country in the interests of short-term gain. Too often, we lack the political will to take the steps necessary to ensure that America remains a technology and innovation leader. In too many areas, we are content to live off the investments that previous generations made for us—in education, in health care, in basic scientific research—but are unwilling to invest equal energy and resources into building on this legacy to ensure that America's future is as bright and prosperous as its present.

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[1] For a recent report on the impact of information technology innovations on U.S. productivity and economic growth, see Robert D. Atkinson & Andrew S. McKay, The Information Technology & Innovation Foundation, *Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution*, Jan. 2007.

[2] I witness the impact of these innovations every day in my work with the Gates Foundation. The Foundation is working with dozens of leading research institutions and biotechnology and pharmaceutical companies, many located in the United States, to develop innovative vaccines for HIV, malaria, and a host of other developing world illnesses. More information about the Gates Foundation's work on global health issues is available on its website: *http://www.gatesfoundation.org/GlobalHealth*.

America simply cannot continue along this course. We must invest now to secure our economic and technological leadership for the future. In my view, we will lose this leadership unless we take three important steps:

• First, we must ensure that America's students and workers have the skills necessary to compete in a digital economy by providing them with the necessary educational opportunities and resources. A top priority must be to reverse our dismal high school graduation rates—with a target of doubling the number of young people who graduate from high school ready for college, career, and life—and to place a major emphasis on encouraging careers in math and science. We must also focus far more of our energies on upgrading the skills of Americans already in the workforce.

• Second, we need to attract and retain the brightest, most talented people from around the world. This will not happen until we reform our immigration policies for highly skilled workers. America should be doing all it can to attract the world's best and brightest. Instead, we are shutting them out and discouraging those already here from staying and contributing to our economic prosperity.

• Third, we need to provide a foundation for innovation by investing in ideas and capturing their value. The public sector in particular needs to continue to increase investments in R&D, especially in basic scientific research, to complement the R&D of the private sector and address new challenges. The R&D tax credit, which provides a critical, proven incentive for companies to increase their investment in U.S.-based research and development, needs to be made permanent. We also need a legal framework that rewards innovation.

I. Providing 21st Century Educational & Training Opportunities

America cannot maintain its innovation leadership if it does not educate world-class innovators and train its workforce to use innovations effectively. Unfortunately, available data suggest that we are failing to do so—in our math and science programs, in our job training programs, and especially in our high schools.

A. Improving America's High Schools

America's greatest educational shortcoming today is what for much of our history was its greatest pride: our public schools. American schools have long been the cornerstone of this country's fundamental belief that all people have equal value and deserve an equal opportunity to lead productive lives. Yet all of the evidence indicates that our high schools are no longer a path to opportunity and success, but a barrier to both.

Our current expectations for what our students should learn in school were set 50 years ago to meet the needs of an economy based on manufacturing and agriculture. We now have an economy based on knowledge and technology. Despite the best efforts of many committed educators and administrators, our high schools have simply failed to adapt to this change. As any parent knows, however, our children have not—they are fully immersed in digital culture.

As a result, while most students enter high school wanting to succeed, too many end up bored, unchallenged and disengaged from the high school curriculum—"digital natives" caught up in an industrial-age learning model. Many high school students today either drop out or simply try to get by. For those who graduate, many lack the skills they need to attend college or to find a job that can support a family. Until we transform the American high school for the 21st century, we will continue limiting the lives of millions of Americans each year. The cost of inaction substantially increases each year that we fail to act. Consider the following facts:

America has one of the lowest high school graduation rates in the industrialized world. According to a study released by *Education Week*, three out of every 10 ninth-grade students will not graduate on time and about half of all African-American and Hispanic ninth graders will not earn a diploma in 4 years. Of those who do graduate and continue on to college, over a quarter have to take remedial courses on material they should have learned in high school. Employers complain that high school graduates today lack the basic writing and analytic skills required to succeed even in entry level positions.

Every student in America should graduate from high school ready for college, career and life. Every child. No exceptions. Whether they are going off to college or into the work force or a combination of the two, it is the responsibility of public education to give our young people the skills, knowledge and preparation for life they need and deserve.

As we work toward this goal, I would urge Congress to place an equal focus on standards, measurements and data, and additional support for students and teachers. Educational standards have one central purpose—to ensure that students make the most of their abilities. For our country and our young people to be successful,

all students should have access to schools and courses that prepare them for college, career and life. Many State standards in place today are unacceptably low.

For instance, only about half of our States require students to take 3 or 4 years of math to graduate from high school. Eight States do not set any math course requirements. Furthermore, in many States, *any* math course counts toward that requirement, as if consumer math were the same as calculus. If high standards encourage young people to make the most of their talents, then low standards discourage them from doing so—and right now, that is our predominant policy. I applaud the commitments made by more than 30 governors to raise their States' math and literacy standards and ensure K–12 policies help students meet the demands of college and work. I commend the President and Secretary of Education for their call for rigorous coursework and the members of this committee for their tireless attention to these issues. We need to continue to support these efforts by offering incentives for States to adopt higher standards.

We also must understand how well our schools and students are performing relative to these standards. Data collection systems must be transparent and accurate so that we can understand what is working and what isn't and for whom. Therefore, we need data by race and income. I urge this committee to support the creation of a Center for State Education Data, which will serve as a national resource for State education data and will provide one-stop access for education research and policymakers, along with a public Web site to streamline education data reporting. But we can't just collect data. We also need to use the data we collect to implement change, including by personalizing learning to make it more relevant and engaging for students—and thereby truly ensure that no child is left behind.

We also need to accurately define and measure graduation rates. Currently, States use a variety of different methods for calculating graduation rates. There is no universally accepted standard that would allow easy comparisons between States or school districts. Recently, the governors of all 50 States took a big step to correct this problem by signing the National Governors Association's Graduation Rate Compact, which commits them to adopt accurate and consistent measurements. Federal policies should provide incentives for States to meet this important goal.

If we are going to demand more from our students and teachers, then it is our obligation to provide them with the support they need to meet the challenge. All students—regardless of age, grade level, gender, or race—do better when they are supported by a good teacher. Committed, quality teachers are the lynchpin of a good educational system, and those that excel—especially in challenging schools or in high-need subjects like math and science—should be rewarded. The Teacher Incentive Fund is an important first step in ensuring that teachers are rewarded, valued and respected as they would be in my company or in any other organization. This program should be made permanent through authorization.

We also need to take steps to ensure that curricula are engaging and relevant to students' current needs. A model for this is the Partnership for 21st Century Skills, of which Microsoft is a member. This unique partnership of education, government, and business leaders seeks to help schools adapt their curricula and classroom environments to align more closely with the skills that students need to succeed in the 21st century economy, such as communication and problem-solving skills.

Finally, we must also ensure that our struggling students have more opportunities for in-depth learning and personal attention. This means more quality learning time in schools, access to high-quality learning materials, after school enrichment programs, and tutors.

Making these changes will be hard, but not impossible. This committee has done important work in this regard through the No Child Left Behind legislation. The reauthorization of No Child Left Behind offers Congress an opportunity to build on this work and address the other critical issues I have highlighted. I know these changes are possible in part through my work with the Gates Foundation, which has invested over $1.5 billion in partnership with nonprofits, school districts, States, the private sector and others, to improve high school education, including the support of more than 1,800 high-quality high schools in 40 States and the District of Columbia. Microsoft has likewise made deep investments in education, especially through our Partners in Learning program. That program creates partnerships to provide resources to educators focused on leadership development and holistic learning reform. One of the program's flagship initiatives has been our collaboration with the School District of Philadelphia to build a "School of the Future"—bringing innovation to all areas of high school redesign, including instruction, technology integration, hiring and professional development, and building design.

I would like to mention three other initiatives in particular that demonstrate what can be achieved:

• **New York City** has opened close to 200 new schools in the last 5 years with many replacing some of the city's most underperforming schools. The first set of new schools achieved an average 79 percent graduation rate compared to graduation rates ranging from 31 to 51 percent at the schools they replaced.

• **Boston's** business, education and civic leaders have made a commitment to dramatically increase the number of young people ready for college and career. A winner of the Broad Prize this year, Boston has increased math scores on the fourth and eighth grade National Assessment of Educational Progress at a faster rate than other large American cities participating in NAEP's Trial Urban District Assessment. The number of AP math and English exams taken by minority students is up more than 200 percent for Latino students and 78 percent for African-Americans since 2002.

• **Early College High Schools** are perhaps the most innovative and groundbreaking initiative underway nationally and show all of us what we can do if we think differently. The early college model is counter-intuitive to most, at least initially. The approach is to recruit traditionally low-performing, struggling students to attend high schools that require enrollment in college courses. The schools provide the corresponding support and guidance for students to graduate with 2 years of college credit and/or an associate's degree. Today, there are more than 125 early college high schools in operation in over 20 States, and there are plans to open up to 45 more by 2008. So far, among the first class of ninth graders at the original three Early College high schools, over 95 percent graduated with a high school diploma, over 57 percent have earned an associate's degree, and over 80 percent have been accepted into 4-year colleges.

I encourage all of you to visit any of these school models or districts and see this innovation first hand.

These pockets of success are exciting. But they alone cannot transform our education systems. Doing that will take political and public will. When people learn about the problems with our high schools, and they hear about the possibility of success, they demand change. That is why the Gates Foundation has joined with the Broad Foundation to support the **Strong American Schools Partnership**. This Partnership, which will be formally launched later this month, is intended to express America's shared vision that we need to demand more for our children now so that they will be more prepared and more successful as adults.

B. Promoting Math and Science Education

Another area where America is falling behind is in math and science education. We cannot possibly sustain an economy founded on technology pre-eminence without a citizenry educated in core technology disciplines such as mathematics, computer science, engineering, and the physical sciences. The economy's need for workers trained in these fields is massive and growing. The U.S. Department of Labor has projected that, in the decade ending in 2014, there will be over 2 million job openings in the United States in these fields. Yet in 2004, just 11 percent of all higher education degrees awarded in the United States were in engineering, mathematics, and the physical sciences—a decline of about a third since 1960.

Recent declines are particularly pronounced in computer science. The percentage of college freshmen planning to major in computer science dropped by 70 percent between 2000 and 2005.[3] In an economy in which computing has become central to innovation in nearly every sector, this decline poses a serious threat to American competitiveness. Indeed, it would not be an exaggeration to say that every significant technological innovation of the 21st century will require new software to make it happen.

The problem begins in high school. International tests have found our fourth graders among the top students in the world in science and above average in math. By eighth grade, they have moved closer to the middle of the pack. By 12th grade, U.S. students score near the bottom of all industrialized nations. Too many students enter college without the basics needed to major in science and engineering. Part of our effort to transform the American high school for the 21st Century must focus on reversing this trend and improving education in math and sciences.

I believe our schools can do better. High schools are emerging around the country that focus on math and science, and they are successfully engaging students who have long been underrepresented in these fields—schools like the School of Science and Technology in Denver, Aviation High School in Seattle, and University High School in Hartford, Connecticut. These schools have augmented traditional teaching methods with new technologies and a rigorous, project-centered curriculum, and

[3] *Jay Vegso, Drop in CS Bachelor's Degree Production*, Computing Research News, March 2006, *available at*: *http://www.cra.org/CRN/articles/march06/vegso.html*.

their students know they are expected to go on to college. This combination is working to draw more young people, especially more African-American and Hispanic young people, to study math and science.

Schools are also partnering with the private sector to strengthen secondary school math and science education, and I want to mention one recent initiative in particular with which Microsoft has been involved. It is called the Microsoft Math Partnership, and it is a public-private initiative designed to focus new attention on improving middle-school math education. Although the program is currently focused on schools in Washington State, we believe this Partnership provides a sound model for public-private sector efforts across America.

To remain competitive in the global economy, we must build on the success of these schools and initiatives and commit to an ambitious national agenda for high school education. But we also must focus on postsecondary education. College and graduate students are simply not obtaining science, technology, engineering, and mathematics ("STEM") degrees in sufficient numbers to meet demand. The number of undergraduate engineering degrees awarded in the United States fell by about 17 percent between 1985 and 2004.

This decline is particularly alarming when we look at educational trends in other countries. In other countries, a much greater percentage of college degrees are in engineering than in the United States.[4] If current trends continue, a significant percentage of all scientists and engineers in the world will be working outside of the United States by 2010.[5]

For years, the decline in the percentage of graduate degrees awarded to American students in science, technology, engineering, and math was offset by an increase in the percentage of foreign students obtaining these degrees.[6] But new security regulations and our obsolete immigration system—which I will address in a moment—are dissuading foreign students from studying in the United States. Consider this: applications to U.S. graduate schools from China and India have declined and fewer students are taking the Graduate Record Exam required for most applicants to U.S. graduate schools.[7] The message here is clear: We can no longer rely on foreign students to ensure that America has enough scientists and engineers to satisfy the demands of an expanding economy.

Tackling this problem will require determination by government and support by industry. The goal should be to "double the number of science, technology, and mathematics graduates by 2015."[8] Achieving this goal will require both funds and innovative ideas. For high schools, we should aim to recruit 10,000 new science and mathematics teachers annually and strengthen the skills of existing teachers. To expand enrollment in postsecondary math and science programs, we should provide 25,000 new 4-year, competitive undergraduate scholarships each year to U.S. citizens attending U.S. institutions and fund 5,000 new graduate fellowships each year. America's young people must come to see STEM degrees as opening a window to opportunity. If we fail at this, we simply will be unable to compete with the emerging innovative powerhouses abroad.

C. Greater Opportunities for Job Training

Even as we work to improve educational opportunities in our school systems and universities, we cannot lose sight of the need to constantly upgrade and enhance the skills and expertise of those people already in our workforce. Securing America's global competitiveness requires not only a highly educated pool of innovators, but also a workforce that is equipped with the skills necessary to use technology effectively. In today's economy, that means a high degree of basic literacy, an increasing level of computing skills, and the ability to create, analyze and communicate knowledge.

Over the next several years, 6 out of every 10 new jobs will be in professional and service-related occupations.[9] Given the state of our educational system, it is not

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[4] National Science Foundation, *http://www.nsf.gov/statistics/seind06/append/c2/at02-38.xls*.

[5] Hannah Beech, *Asia's Great Science Experiment*, Time Magazine, October 23, 2006, *available at*: *http://www.time.com/time/magazine/article/0,9171,1549364,00.html*.

[6] A recent study concluded that roughly 43 percent of computer science and engineering degree recipients are nonresident aliens. *See* Kessler, supra note 4.

[7] *Id*.

[8] The Business Roundtable, *Tapping America's Potential: The Education for Innovation Initiative*, July 2005, *http://www.businessroundtable.org/pdf/20050727002TAPStatement.pdf*.

[9] Daniel Hecker, *Occupational Employment Projections to 2014*, Monthly Labor Review, November 2005, at 70, 71, *http://www.bls.gov/opub/mlr/2005/11/art5full.pdf*.

surprising that U.S. companies are reporting serious shortages of skilled workers.[10] According to a 2005 U.S. Department of Education study, only 13 percent of American adults are proficient in the knowledge and skills needed to search, comprehend and use information, or to perform computational tasks.[11] This yawning gap between America's economic needs and the skills of its workforce indicates that as a nation we are not doing nearly enough to equip and continuously improve the capabilities of American workers.

Part of this task must fall to the private sector. For its part, Microsoft over the past decade has launched a range of both commercial and philanthropic programs aimed at providing IT skills training to U.S. workers. Our commercial offerings include the Microsoft Learning program, which provides IT skills training and certification in cooperation with hundreds of commercial partners, and the Microsoft IT Academy, which provides online IT training programs and other resources to accredited educational institutions across the United States.

But several years ago, we decided to focus our community outreach programs to support training in basic computing and Internet skills—a program we call Unlimited Potential. Through this program, we provide the curriculum, software and grants to support digital skills training in community learning centers run by government and nongovernment agencies throughout the country and around the world. For example, last year, Microsoft partnered with the U.S. Department of Labor to provide $3.5 million in cash and software to 20 of the Department's One-Stop Career Centers located throughout the country. We also donated our innovative Digital Literacy curriculum to those Centers to advance their technology training mission. We have similar partnerships with the Boys and Girls Clubs, the National Urban League and with many development agencies and NGOs in more than 100 countries.

In combination with our parallel program for school-based training, Partners in Learning, our ambition is to reach a quarter of a billion people by the end of this decade. Meanwhile, we have begun reaching out to other companies, industry associations and State agencies to build a workforce alliance that will promote the digital skills needed to compete in a wide range of industry and service sectors.

As a Nation, our goal should be to ensure that, by 2010, every job seeker, every displaced worker, and every individual in the U.S. workforce has access to the education and training they need to succeed in the knowledge economy. This means embracing the concept of "lifelong learning" as part of the normal career path of American workers, so that they can use new technologies and meet new challenges. Neither industry nor government can achieve these goals if we act alone. Federal, State, and local governments must help to prepare all of our workers for the jobs required in a knowledge economy. Workforce enhancement should be treated as a matter of national competitive survival. It is a down-payment on our future, an extremely vital step to secure American competitiveness for future generations and to honor the American ideal that every single one of us deserves the opportunity to participate in America's success.

II. Attracting and Retaining the World's Best and Brightest

For generations, America has prospered largely by attracting the world's best and brightest to study, live and work in the United States. Our success at attracting the greatest talent has helped us become a global innovation leader, enriched our culture, and created economic opportunities for all Americans.

Unfortunately, America's immigration policies are driving away the world's best and brightest precisely when we need them most. I appreciate the vital national security goals that motivate many of these policies. I am convinced, however, that we can protect our national security in ways that do less damage to our competitiveness and prosperity. Moreover, the terrible shortfall in our visa supply for the highly skilled stems not from security concerns, but from visa policies that have not been updated in over a decade and a half. We live in a different economy now. Simply put: It makes no sense to tell well-trained, highly skilled individuals—many of whom are educated at our top colleges and universities—that the United States does not welcome or value them. For too many foreign students and professionals, however, our immigration policies send precisely this message.

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[10] *See, e.g.*, Phyllis Eisen, et al., *2005 Skills Gap Report—A Survey of the American Manufacturing Workforce*, December 2005, *http://www.nam.org/s—nam/bin.asp?CID=202426&DID=235731&DOC=FILE.PDF*.

[11] National Center for Education Statistics, U.S. Department of Education, *National Assessment of Adult Literacy: A First Look at the Literacy of America's Adults in the 21st Century*, December 2005, at 4, *http://nces.ed.gov/NAAL/PDF/2006470.PDF*.

This should be deeply troubling to us, both in human terms and in terms of our own economic self-interest. America will find it infinitely more difficult to maintain its technological leadership if it shuts out the very people who are most able to help us compete. Other nations are recognizing and benefiting from this situation. They are crafting their immigration policies to attract highly talented students and professionals who would otherwise study, live, and work here. Our lost opportunities are their gains.

I personally witness the ill effects of these policies on an almost daily basis at Microsoft. Under the current system, the number of H-1B visas available runs out faster and faster each year. The current base cap of 65,000 is arbitrarily set and bears no relation to U.S. industry's demand for skilled professionals. For fiscal year 2007, the supply did not last even 8 weeks into the filing period, and ran out more than 4 months before that fiscal year even began.

For fiscal year 2008, H-1Bs are expected to run out next month, the first month that it is possible to apply for them. This means that no new H-1B visas—often the only visa category available to recruit critically needed professional workers—will be available for a nearly 18-month period. Moreover, this year, for the first time in the history of the program, the supply will run out before the year's graduating students get their degrees. This means that U.S. employers will not be able to get H-1B visas for an entire crop of U.S. graduates. We are essentially asking top talent to leave the United States.

As with H-1B visas, the demand for green cards far exceeds the supply. Today, only 140,000 permanent employment-based visas are available each year, which must cover both key employees and their family members. There is a massive backlog in many of the employment-based green card categories, and wait times routinely reach 5 years. Ironically, waiting periods are even longer for nationals of India and China—the very countries that are key recruiting grounds for the professionals desperately needed in many innovative fields.

In the past, we have succeeded in attracting the world's best and brightest to study and work in the United States, and we can and must do it again. We must move beyond the debate about numbers, quotas, and caps. Rather, I urge Congress to ask, "How do we create a system that supports and sustains the innovation that drives American growth, economic opportunity and prosperity?" Congress can answer that question by acting immediately in two significant ways.

First, we need to encourage the best students from abroad to enroll in our colleges and universities, and to remain in the United States when their studies are completed. Today, we take exactly the opposite approach. Foreign students who apply for a student visa to the United States today must prove that they *do not* intend to remain here once they receive their degrees. This makes no sense. If we are going to invest in educating foreign students—which we should and must continue to do—why drive them away just when this investment starts to pay off for the American economy?

Barring high-skilled immigrants from entry to the United States, and forcing the ones that are here to leave because they cannot obtain a visa, ultimately forces U.S. employers to shift development work and other critical projects offshore. This can also force U.S. companies to fill related management, design, and business positions with foreign workers, thereby causing further lost U.S. job opportunities even in areas where America is strong, allowing other countries to "bootstrap" themselves into these areas, and further weakening our global competitive strength. If we can retain these research projects in the United States, by contrast, we can stimulate domestic job and economic growth. In short, where innovation and innovators go, jobs are soon to follow.

Second, Congress should expedite the path to Permanent Resident status for highly skilled workers. The reality for Microsoft and many other U.S. employers is that the H-1B visa program is temporary only in the sense that it is the visa we use while working assiduously to make our H-1B hires—whether educated in the United States or abroad—permanent U.S. residents. Rather than pretend that we want these highly skilled, well trained innovators to remain for only a temporary period, we should accept and indeed embrace the fact that we want them to become permanent U.S. residents so that they can drive innovation and economic growth alongside America's native born talent.

These reforms do not pit U.S. workers against those foreign born. They do not seek to make or perpetuate distinctions among the best and brightest on the basis of national origin. They simply recognize the fact that America's need for highly skilled workers has never been greater, and that broad-based prosperity in America depends on having enough such workers to satisfy our demand. Far from displacing U.S. workers, highly skilled foreign-born workers will continue to function as they always have: as net job creators.

III. Investing in Research, Rewarding Innovation

A. Investments in Research and Development

America's current technology leadership is a direct result of investments that previous generations made in basic scientific research, especially publicly funded projects undertaken in government and university research labs. For instance, research in the 1970s by the Defense Department's Advanced Research Projects Agency (ARPA, later known as DARPA) led directly to many of the technologies that underlie today's Internet. As another example, grants from the U.S. Navy and the National Science Foundation helped fund the development of public key encryption systems, which we now use daily in everything from ATM machines to email and electronic commerce.

American companies were able to capitalize on these innovations and turn them into globally successful products because of our world-class universities, innovative policies on technology transfer, and pro-investment tax rules. These policies have driven a surge in private-sector R&D investment. Since the mid-1970s, U.S. industry investment in R&D has more than quadrupled. Today, industry is responsible for two-thirds of total R&D in the United States, and as of the early part of this decade, industry R&D investments were growing faster than the economy as a whole. Microsoft in many ways exemplifies this trend. We annually invest over $6 billion in R&D, which ranks among the highest R&D expenditures in the world by a major technology provider, both in absolute terms and as a percentage of revenues.

As important as private-sector R&D investment is, Federal research funding is equally vital to America's technology leadership. Federally funded research enriches the commons of knowledge and provides the raw material for U.S. industry to transform into commercially successful products. Federal funding for university-based R&D also helps educate the next generation of scientists and engineers—those who will largely determine whether America remains innovative and globally competitive.

In my view, America's ability to remain a technological powerhouse will depend in large part on the extent to which the Federal Government invests in basic research. Unfortunately, Federal research spending is not keeping pace with our Nation's needs. According to the Task Force on the Future of American Innovation, "as a share of GDP, the U.S. Federal investment in both physical sciences and engineering research has dropped by half since 1970. In inflation-adjusted dollars, Federal funding for physical sciences research has been flat for two decades. . . ."[12] This stagnation in spending comes at a time when other countries and regions, such as China and the EU, are increasing their public investments in R&D.

To ensure that our Federal and university research labs continue to serve as sources of innovation and expertly trained scientists, and that industry has incentives to continue investing heavily in R&D, it is critical that Congress take the following steps:

First, the Federal Government needs to increase funding for basic scientific research significantly. While recent increases in the research budgets of the Department of Energy and the National Science Foundation are commendable, more must be done. As Federal research priorities expand into new areas, we should seek to increase funding for basic research by 10 percent annually over the next 7 years. Congress should consider other innovative ideas as well, such as: (1) new research grants of $500,000 each annually to 200 of the most outstanding early-career researchers; (2) a new National Coordination Office for Research Infrastructure to manage a centralized research-infrastructure fund of $500 million per year; (3) establishing and providing funding for Advanced Research Projects Agencies in various departments, similar to DARPA of the 1970s; and (4) ensuring that research projects are communicated to the private sector so that companies can collaborate more effectively with recipients of public research funds.

Second, Congress should permanently extend the R&D tax credit, which expires again at the end of 2007. Each year, Microsoft creates thousands of new R&D jobs throughout the world. As we continue to look for opportunities to reduce costs across our business, the R&D tax credit provides an important incentive to encourage Microsoft and other U.S. companies to continue to increase R&D investment in the United States. The credit is a positive stimulus to U.S. investment, innovation, wage growth, consumption, and exports, all contributing to a stronger economy and a

[12] Task Force on the Future of American Innovation, *Measuring the Moment: Innovation, National Security, and Economic Competitiveness*, November 2006, at 9, *http://futureofinnovation.org/2006report/* (follow "Benchmarks of Our Innovation Future" report hyperlink).

higher standard of living. As other countries recognize the long-term value of R&D and offer permanent and generous incentives to attract R&D projects, the United States must renew its commitment to U.S.-based R&D by making the tax credit permanent so businesses may rely on it when making decisions on where to source R&D projects.

B. Rewarding Innovation

In addition to investing in innovation, we must also reward innovators. This means giving inventors the ability to obtain intellectual property protection for their innovations, and to enforce these rights in the marketplace. America is fortunate that our leaders recognize the importance of intellectual property rights and the need for these rights to be respected, both at home and abroad. I know I join many other Americans in thanking this Congress and this Administration for their tireless efforts to promote intellectual property protection.

In this regard, I would briefly note Microsoft's support for current efforts in Congress to reform the U.S. patent system to meet the needs of the 21st century. Microsoft and other technology companies are working closely with Chairman Leahy and Senator Hatch on the Senate Judiciary Committee, and with the leadership of the House Judiciary Committee, to advance legislation on needed reforms. Although I will not delve into the details here, the reforms supported by Microsoft and many others will improve patent quality, reduce excessive litigation, and promote international patent harmonization—reforms that are vital if America is to retain its preeminence in technology innovation.

In my view, the challenges confronting America's global competitiveness and technological leadership are among the greatest we have faced in our lifetime. Frankly, we have not been the careful stewards of our own "innovation account" that our children and grandchildren have a right to expect of us. It is time to revisit our game plan in this regard.

I recognize that implementing these solutions will not be easy and will take strong political will and courageous leadership. But I firmly believe that our efforts, if we succeed, will pay rich dividends for our Nation's next generation. We have had the amazing good fortune to live through one of the most prosperous and innovative periods in history. We must not squander this opportunity to secure America's continued competitiveness and prosperity.

Thank you again for this opportunity to testify. I welcome your questions on these topics.

The CHAIRMAN. Well, thank you very much, Mr. Gates. And thank you particularly for your extensive testimony. I hope members will get a chance to, sort of, take that with them. It's a very detailed, elaborate testimony that expands on each of these points, an enormous amount of useful and constructive information.

We'll try and do 4-minute rounds. I think we've got quite a group here. I'd cut it to less than that but hopefully, we'll keep the questions short.

We're going to address a number of these issues on the immigration—we've had a chance to talk, and we're continuing to talk, and I think the points that you mentioned make a lot of very, very good sense, and we'll work closely with you when we have an opportunity to get to that.

I'd like to ask you a broader question, and that is about the spirit of innovation and discovery. Your company is THE company in the world that really epitomizes innovation and discovery. We have seen this Nation, at different times—whether it was building the Brooklyn Bridge or going to the Moon—where we had this spirit of innovation and discovery. I'm interested in what you would say—or what your comment is on the broad theme about how you generate that kind of spirit of innovation and discovery, and have something that's valued by the American people, so that they expect leadership in these areas by those who are going to lead this Nation. How do we get to the point where this Nation is just not eating seed corn from the past generation, as you, kind of, ref-

erenced, but really is going to be the kind of generation that is going to add an additional dimension into our society in these areas—the life science century. We are there, in terms of the progress in the human genome and stem cell research. The possibilities are virtually unlimited. What can you tell us and tell the American people about what they ought to expect and what leaders ought to provide?

Mr. GATES. Well, the opportunities for innovation in the computer field and in the health field, in particular, are much greater than I think people recognize. The pace of innovation in those areas will be far more rapid than ever before. And so, there'll be some wonderful breakthroughs—computers that we can talk to and continued low cost, even using computers in education in some ways that we've never seen before, so that every kid can access the world's knowledge and find other kids who have similar interests. I think as people see that, there will be a great level of excitement.

The world at large envies two things that the United States has. We have the world's best universities—the top 20 universities—a list anywhere from 15 to 19 of those, people would say, are in the United States. Now, that's recognized by countries overseas, and they're, likewise, making investments in their universities. But that is a huge advantage. And even if you look at where the companies that do technological advances—biotech or computer companies, where they've grown up, it's largely where the top universities are, as opposed to just the large population centers.

This is a country that the most talented people in the world want to come and work at. And so, if you look at any of the technology companies, which are the ones I know best, they're quite a mix of people who grew up in the United States and foreign-born people.

The excitement about these breakthroughs—we definitely need to do more to share that story, because if we look at the enrollment trends in science and math, it continues to decline, and the declines are even more pronounced if you look at women in those fields, or minorities in those fields. And so, you have this contradiction. Here you have Apple, Google, Microsoft, great companies doing neat things, and you'd expect that would draw the young people in, into those fields. And yet, because of the curriculum or the quality of the teaching in those areas, it's not happening here. And that's partly why there is this shortage. And yet, other countries are putting the energy in——

The CHAIRMAN. Let me just ask, because——

Mr. GATES. Yeah.

The CHAIRMAN [continuing]. My time is going to be up. You outlined, in particular, the area of education. You're noted for accountability. What do you expect of the business community. This would be extensive kinds of investments that you've outlined, in terms of the recommendations. What should we expect from the business community—what role can they play, in terms of helping to move in these directions, particularly the area of education? Do you see a role for them in there? What should we expect from them? What should we ask them?

Mr. GATES. Well, first and foremost, the business community has to be an advocate for high-quality education, that those investments are fundamental to their future. The business community

also will be a leader, in terms of workforce training. There's some very innovative ways of using online Internet training and skills testing that is starting in the business community, but I think will even start to be used in universities, as well.

Businesses like Microsoft have a particular expertise—in our case, software—can provide that to schools, can make sure our employees are volunteering and getting the computer science learning, even down in the elementary schools, to be as strong as it can be. So, I think business is seeing this as a top issue, and wants to get more involved. In some cases, coming in to the schools and helping out, that's hard for them to do, but I think the desire is definitely there.

The CHAIRMAN. Senator Enzi.

Thank you.

Senator ENZI. Thank you, Mr. Chairman.

I really appreciate your comments about rewarding teachers who excel. We did have, in our appropriations, a little over $100 million for doing that. But there seems to be some concern about paying a little bit more to somebody who does well, and that got pulled out of the final appropriations bill.

A year ago, I was in India. We were trying to find out how they graduate so many scientists and engineers. I met with one person that I thought had some great insight. They said that they didn't have any professional sports teams.

[Laughter.]

Senator ENZI. So, the highest pay and the most prestige that they could get was being a scientist or an engineer or a doctor, something in that kind of field.

We're trying to strengthen Americans' competitiveness in this global economy, and we know that workers have to know and understand math and science. And once kids drop out of math and science, they never seem to get back into it. So, how do we do that? Do we fire them up with fear, or just desire and knowledge? Do you have any suggestions for how we get kids interested in the science and math fields?

Mr. GATES. Well, one of the positive data points in this area is that there's over a thousand high schools that the Gates Foundation has helped support that take a bit of a different approach. These are smaller high schools where kids are taking less subjects at a time, and a number of those have themes. The themes are quite varied. Some are early college, some are high-tech, some are art, construction, aviation, Outward Bound. It takes the math curriculum, and instead of it just being math for math's sake, they teach it in terms of solving a problem, dealing with a project. Many of these schools are seeing much higher percentages of kids interested in going into math and science. For example, High Tech High, which there's quite a few of those now, over 30 percent of the kids say they want to go into math and science. So, that's more than double the number that you have out of the typical high school.

I think with the quality of the math and science teachers that are engaged in their field, who can share the love of their field, and some improvements in the curriculum, would be very important elements of that.

Senator ENZI. Thank you. We have a first robotics competition that gets kids interested in engineering and some of those things, too. I've been doing an inventors conference in Wyoming every year to stimulate kids to think about inventions—not necessarily ones as complicated as computers, just the idea of innovation—and that's been having some success at getting kids into science.

Since we have a lot of members here with us, I'll go ahead and relinquish the rest of my time. I really appreciate your testimony, and I'll be inviting you to my inventors conferences.

Mr. GATES. Excellent. Thank you.

The CHAIRMAN. Senator Dodd.

Senator DODD. Thank you very much, Mr. Chairman.

And, Mr. Gates, welcome to the committee. All of us want to underscore the comments of Senator Kennedy and Senator Murray in the opening remarks. We have great admiration for you, what you've done with your company, but also what you're doing with your Foundation and your deep commitment to these issues. So, thank you immensely for that.

Vern Ehlers and I have a piece of legislation on voluntary national standards. We emphasize the word "voluntary" because of the problems with mandated standards. We'd invite your attention to take a look at it. We provide some incentives in there to try and get them—given the fact that we see States dumbing-down, too many cases, test scores here so that they're not—they stay in operation, but certainly not providing the kind of standardized judgments that we want to make about whether or not we're reaching the goals that we all want to have for us.

And I appreciate you mentioning the university high schools. We had a hearing of this committee at the University of Hartford several years ago, which is one of those institutions you talked about here, where the university has the high school on the campus of the University of Hartford. In fact, Senator Alexander and I had a witness before this committee, of a young man who's a student at that university high school, who was very compelling to all of us here, and the experience he's having as a result of being drawn out and brought into that environment, making a difference with it.

United Technologies Corporation, in Connecticut, George David, who I think you may know, the chief executive officer there, offers to all of their employees worldwide the time, the cost, and the incentive of offering stock to students who get a higher degree, who are employees of the United Technologies. It costs the corporation, obviously, a significant amount, but the advantage has been tremendous, in terms of retention and productivity of their employees. So, there's very creative ideas that are occurring all over the place.

I want to draw your attention, if I can, to a subject matter we've spent a lot of time on in this committee over the years, dealing with 0 to 3. In fact, one of your great pals and friends, Warren Buffett, his daughter, Susie Buffett, is very involved in this issue, as well. I wonder if you might draw some attention to that question here in response, to this idea of early intervention with these—the brain development. We start identifying—in fact, many people made by the time a student's in the third grade, they're already—if they're not succeeding and moving forward, their ability to suc-

ceed and develop the appetites for math and science are diminished to a large extent. And there's been some suggestions of starting things like universal pre-K programs so you really—and quality childcare, so that you begin to get that parental involvement early on to develop and nurture the ability of these children to be ready to learn, to then accept the disciplines in math and science. I know you've done a lot of work in the health-related areas, but I wonder if you might just address some of the early interventions that might be made to increase the possibility of students developing these appetites.

Mr. GATES. OK. The first times of the tests, I think it is important for us to know where we stand. Mathematics is not different in one State versus another State. Having a clear understanding of where our fourth-graders, eighth-graders, and seniors are in these areas, we're certainly a big advocate of that. The problem you get into is, as soon as you realize how bad the situation is, then it's like a hot potato, people say, "Well, what's the problem?" I think with NCLB, one of the great things is, it has pointed out these deficits, and there's lots of discussion about how that can be improved. But, I think, overall that's a big contribution, that people have seen, the minority achievement is not where it should be, and the various high schools are not where they should be.

In terms of the early-learning part, there's varying data on this. If you take the United States, at the fourth-grade level we are still largely at the top in testing of fourth-graders. By eighth-graders, we're in the middle of the pack; and by senior year, we're basically at the bottom of rich countries. So there's clearly something happening there. We have the highest dropout rate, and that's why the Foundation—early learning's important, elementary's important—we took high schools as our big focus, particularly because there wasn't a lot going on in that area. We do, in Washington State, have a couple of early-learning pilots that are very similar to what Susie Buffett's done in Omaha and what a number of people have done in Chicago. Some of the tracking data suggests those early interventions last, some of the data suggests those early interventions fade in benefit, because the environment, both the social and home environment that those kids are in, that within 3 years, a lot of that is gone away.

Some of these tough issues in education, like merit systems that teachers will embrace, or curricula that uses technology a new way, those are some of the issues that, in the middle of next year, as I move to be full time at the Foundation, I want to spend a lot more time sitting and watching what goes on, and learning a lot about. Early learning has some real benefits, but the numbers are still—there's quite a range of opinions about how impactful it is.

Senator DODD. I appreciate that very much and look forward to it, as well.

Thanks, Mr. Chairman.

The CHAIRMAN. Senator Gregg.

Senator GREGG. Thank you.

Let me join my colleagues in thanking you for your efforts in putting your dollars behind your language, especially on the issue of education. I agree with you that the issue is at the high school level. When Senator Kennedy and I were putting together No Child

Left Behind, we focused on math and science because it was a quantitative event, but we didn't get into high school issues because the Federal Government really doesn't have a role in high schools. We don't fund high schools.

The one place we do have a role is in this area of immigration, which you've mentioned. I'm also in total agreement with your view, which I would characterize, and maybe inappropriately, as going around the world and picking the best and the brightest, and having them come to the United States. That's what we've done as a culture, and we've been very successful.

So, I guess my first question to you is, Do you have a number that you think we need, relative to the H-1B visa program? Today, it's statutorily set at about 65,000, but we're up to about 120,000. Do you think that number should be raised to 200,000, 300,000? What number would give America the capacity to get the people we need to come here to take advantage of our society and allow us to access their abilities?

Mr. GATES. Well, my basic view is that an infinite number of people coming who are taking jobs that pay over $100,000 a year are going to pay taxes—we create lots of other jobs around those people—so my basic view is that the country should welcome as many of those people as we can get, because people with those great talents, particularly in engineering areas, the jobs are going to exist somewhere, and the jobs around them are going to be created wherever those uniquely talented people are. So, even though it may not be realistic, I don't think there should be any limit. Other countries have systems where, based on your education, your employability, you're scored for immigration. And so, these people would not have difficulty getting into other rich countries. In fact, countries like Canada and Australia have been beneficiaries of our system—discouraging these people with both the limits and the long waits and the—what the process feels like as they go through the security checks.

There are some suggestions about if we could, say, in the green card system not have to count the family members—if you somewhat more than doubled that, you could start to clear the backlog and not have that be a problem. Likewise, with H-1B, if you had a few categories, like people who are educated here in this country, that you gave an exemption outside of the quota that somewhat more than doubling would get us what we need. But that—to some degree, that's sort of like a centrally managed economy, both——

Senator GREGG. Unfortunately, if I could—because my time's going to be up—that's what we have here. I agree 100 percent that we shouldn't have a limit on highly skilled people coming into the country. But we do have a centrally managed economy, and right now it's not being managed well. So, I would presume that if we were to double the number, say, to 300,000, you wouldn't have any problem with that, since you're willing to go to infinity.

Mr. GATES. Well, it would be a fantastic improvement. And I do think that there's a draft bill that has provisions that would largely take care of this problem.

Senator GREGG. We also have something called a lottery system, which allows 50,000 people in the country simply because they win a lottery. They could be a truck driver from the Ukraine. Last year,

I offered an amendment which would have changed that system by requiring that 60 percent of those in the lottery be people with advanced degrees. So, you'd have to be a physicist from Ukraine before you could win the lottery. Do you think that would be a better approach, maybe?

Mr. GATES. Well, I'm not an expert on the various categories that exist. I don't actually know that lottery system. I know the engineers at Microsoft, nobody comes up to me and says, "Hey, I won this lottery."

Senator GREGG. Well, that's the problem.

Mr. GATES. But there's a lot of different categories in there and I'm not sure how they should all be handled. But I do know in the case of the engineering situation we should specifically have that be dramatically increased.

Senator GREGG. Thank you.

The CHAIRMAN. Normally, Mr. Gates, we'd have Senator Murray here. She's chairing a Veterans Committee at this time. And I think we understand the importance of that, particularly at this time. So, she is necessarily absent and wanted me to extend her wishes.

Senator Clinton.

Senator CLINTON. Thank you, Mr. Chairman.

And welcome, Mr. Gates. We're delighted to have you.

Senator Enzi made reference to Sputnik, 50 years ago. And one of the ongoing results of that event was to really focus America's attention on what we needed to do with math and science education to try to provide loans for school, the NDEA loans. I've got one, even though I was not a math or science person. And I think it's really appropriate in the—2007 we would take another look at what we need to do to be competitive and to maintain our scientific and technological edge.

You said in your testimony that we should set a goal of making sure every young person graduates from high school, which I agree with. And there are benefits to that, even if the curriculum is not as good as we would want it, or the outcomes, it is still a positive. And then, in your testimony you also talk about the skills of the existing workforce. And I'd like to turn our attention to that for a minute, because clearly we have an existing workforce that we hope can be supplemented both by people coming from abroad, but also by a better pipeline of our own citizens. How do you see the most effective way of trying to improve the skills of the workforce here? I know you have a couple of programs that Microsoft has used to try to do that. Could you give us a little more detail on what works to improve the IT and computing skills, and how we could perhaps focus on that also from this committee to try to improve the outcomes?

Mr. GATES. Many of the Microsoft programs have focused on the areas where you have industries which are reducing the number of employees, and then going into those situations and giving the training—and fairly basic training; this is not high-level engineering, this is training somebody so they'd be effective in a call-center environment or an aide-type work, which is very good work. And so, we've gone to the hotspots where you have, say, a factory shut-

ting down or significant employment, and made sure that the opportunities to learn are there.

One of our most successful things wasn't really intended as a workforce training thing, it was actually the libraries program, where we went to all the libraries in the country. The computers were funded by the Foundation, and Microsoft gave the software. And it's been amazing to see people coming into those libraries, who are looking at job opportunities and then looking at what kind of training can be available. One of the new trends is that training, instead of just being in a classroom, that the videos—great videos and great tests for these things are starting to become available on the Internet. And so, if you're lucky enough to be able to get to a computer, either in a library or a community center or somehow, then you can access all of this great learning material, and even test your skills, and even get accreditation. And so, Microsoft, Cisco, and a number of others have created accreditation tests, not just for high-level engineering, but for, like, operators and other jobs. And people with those certificates are able, then, to move into the workforce in a fairly straightforward fashion.

So, we can use technology to improve these training opportunities. We can go after the hotspots, and then just broad infrastructure, going beyond libraries, can give people more access.

Senator CLINTON. I also think, though, that some of these programs would be useful in our high schools, and even our junior high schools, because a lot of the data that I'm seeing says that kids are bored, they don't feel stimulated, there's not enough technology in their school environment compared to their outside-of-school environment.

Finally, Mr. Gates, you made a brief reference to health IT, as you made your initial remarks. This is something that Senator Kennedy and Senator Enzi and I and others have been working on for a number of years, to try to create an architecture for a national system of health IT in the medical field, which we think will have innumerable benefits for patients and providers and others. Could you say just an additional word about what you see for the future of health IT and how important it is that we begin to set up some kind of a system so that everybody knows what the standards are and how we can begin to implement that?

Mr. GATES. Well, the current state of health IT is surprisingly poor; that is, the amount of paperwork, the information that's incorrect, the overhead in the system of just trying to shuffle things around. We see that, whether it's in the costs, or also in the outcomes. If you're away from your normal location, and you're injured, how do they have access to the information? And, so far, a lot of the things have just made you sign more privacy release statements. And so, I think Microsoft, Intel, a lot of the technology companies are saying, "We've got to invest more in healthcare." We created, ourselves, just 2 years ago, a new business in this area, because there's really an opportunity to create the software. We're also seeing that consumers are interested in looking at their healthcare costs, not—for themselves, partly, but also—say you have an older relative that you're helping to manage their bills, what's going on—how do you easily see what's going on and make sure the right choices are being made there? And if we could get

some standards, then this idea of having it online and having people make choices, even being able to look at quality data, look at cost data, we'd get more of a market dynamic into the health system, which is a very important thing.

So, there are some initiatives that we're behind, and we've got some of our experts coming out and spending time talking about that. There is more that Congress could do on this, because within the next 3 or 4 years, we ought to be able to make a dramatic change and reduce those costs, and create the visibility that better choices and incentives are driven into the system.

Senator CLINTON. Thank you.

The CHAIRMAN. Thank you very much.

Senator Bingaman and Senator Alexander have been particularly involved in this—in competitiveness legislation—many members of this committee. And so, we acknowledge that effort and are glad to call on Senator Alexander.

Senator ALEXANDER. Thank you, Mr. Chairman.

And, Mr. Gates, thank you for coming. I'm especially glad that you came, because it calls attention to what Senator Kennedy just mentioned. Two years ago, we asked the National Academy of Sciences a simple question, Exactly what should we do to keep our brainpower advantage? And they gave us 20 specific recommendations, in priority order, starting with K through 12. Up to 70 Senators have been working on that in one way or the other over the last 2 years, and our two Senate leaders, Reid and McConnell, introduced that on Monday into the Senate, with broad support, and it includes most of the provisions that you recommended, or at least many of your recommendations that were in your excellent testimony. So, your presence here helps call attention to this issue, in fact it is getting more attention than our announcement on Monday, and I'm glad to call attention to what's going on.

Also, as Senator Gregg mentioned, the immigration bill that many worked on had several provisions—stapling a green card to the lapel of Ph.D. or master's degree person, foreign-born person. And there is an opportunity, I would say, this year, as we work on immigration, to significantly expand that. I think there's a broad consensus in the Senate that we ought to give more preference to highly skilled foreign-born people. We should be insourcing brainpower. And we just need to think of ways to do it.

My question goes back to a comment that Senator Enzi made, about a reference you made, to your work with the foundation—25 some—years agos that not one State was paying one teacher one penny more for being a good teacher. I was Governor of Tennessee at the time. And I didn't know that until my second term as Governor. So, I set about to try to change it. And one of the persons I worked with was Albert Shanker, the late head of the American Federation of Teachers, who said, "Well, if we can have master plumbers, we should be able to have master teachers." But we've made very little progress on that since then, because we haven't been able to find a fair way to reward outstanding teachers and outstanding school leadership.

Yesterday, Senator Kennedy hosted a discussion, where every witness talked about the need for gifted mentor teachers, gifted teachers to go into the inner city, gifted teachers to teach gifted

students. All exceptional men and women, yet we dance around the problem that we have no way to reward them, for their excellence, with higher pay.

Now, the Teacher Incentive Fund you mentioned in your testimony was in the No Child Left Behind Act. President Bush has recommended $200 million for next year, but it got cut, maybe by accident in the confusion between last session and this session. But it basically has a series of programs across the country—Philadelphia, New York, places where you're working, some working with local union leadership to find fair ways to reward outstanding principals and teachers. So, my question for you is, and my hope would be, as you move more into your Foundation work, do you think it would be useful, the next 5 years, to encourage such efforts as a Teacher Incentive Fund and private foundation efforts to crack this nut of finding multiple fair ways of rewarding excellence in teaching and school leadership by paying people more for teaching and leading well?

Mr. GATES. Absolutely. Having the incentive system work is very, very, important. And one of our challenges is that these two areas, health and education, that are higher and higher percentage of the economy, bringing the right type of metrics and, sort of, market-based activities to those has proven to be very difficult. And I think, in terms of how teacher evaluation is done, we should encourage lots of experiments and make sure that people are doing the experiments, get some extra funds to go and do those. This is a great example where we don't know the answer today of what is a merit system that would pay great teachers more, that teachers, as a whole, would feel is a predictable, well-run system. And, as we do these experiments, we might have to invest more in teacher remediation or reviewing what's going on with teachers.

Technology can help. The costs of actually seeing what goes on, helping teachers see how they can do better, and letting them learn from other teachers, seeing what they do and using their curriculum, the cost of that is coming down quite a bit. So, we need to make sure that a willingness to try these things are out there, and that the—some of the extra money that it requires is there. Simply, if you just say, "We're going to do merit-based" today, people don't think the measurement approaches are going to be predictable enough for them.

Senator ALEXANDER. Thank you, Mr. Chairman. And I think the data center that Mr. Gates suggested in his testimony might be helpful in gathering the increasing information on student achievement, and relating that to teacher effectiveness.

The CHAIRMAN. Thank you very much.

Senator Reed.

Senator REED. Well, thank you very much, Mr. Chairman.

And welcome, Mr. Gates. Thank you.

And your testimony, I found, was very persuasive. And you said committed quality teachers are the lynchpin of a good education system. And I think many of the questions you're getting today are, sort of, circling around that issue of, How do we get quality teachers into our system? And I'm just very curious, in general, what are your thoughts of things we could be doing, things that we could do in partnership with private foundations like your own. What are

the impediments that you see, from your perspective, to getting good teachers, technically qualified, in the right places?

Mr. GATES. Well, I definitely think if you could have an incentive system that allowed good teachers to be paid more, you would draw more people into the field. So, you have this Catch-22, that, because there's no good measurement system, you don't have people who like to have that type of approach taken. Historically, we probably benefited—it was unjust, but that—because women had less opportunities in other fields, there were super-talented people who went in, even though the economic rewards were not that great. That's changed. A lot of those talented women are now the majority of our business schools, our law schools, and that sort of thing.

Senator REED. Some of them are sitting right next to me.

Mr. GATES. Absolutely. The lack of attention that is given to making it attractive to be a teacher, and having measurement systems there, now it's more important than ever.

There are some of these charter schools that we're involved with that have been given permission to certify teachers. And so, they're able to take people who are math- and science-oriented, and who do not have, say, the broad set of requirements that a normal teacher certificate would require, but they're allowed to come in and teach in those areas. And so, how much loosening up you could do to let people come in, both full time for a number of years, or even, in some cases, part-time, to come in and share their enthusiasm and be part of that mix, I think we need a lot more experimentation with that. And the charter structure, in many States, has allowed us to try some of those things out. And in California, in particular, it's been quite effective.

Senator REED. Well, I agree with your insight that the metrics are very important. I would hope that that would be something that you would be working on through your educational issue, and other thoughtful individuals and groups.

Then, the second issue, if you've got the metrics right, how do you actually do the compensation? Some thought has been given to using the tax system now, because it might avoid the whole issue of who decides, in terms of the pay? Is it a local level? And a group of policy people of the Horizon projects have suggested significant tax breaks for qualified teachers who meet certain criteria. And it just strikes me as that might avoid some of the fighting we've seen between—at the local level between—this notion of merit pay is distrusted, because who's going to distribute it? How are they going to decide, etc.? And I'm just wondering if you have a thought or comment.

Mr. GATES. Yeah, I don't see any technique that avoids the hard fact that a merit-based system involves making judgments about——

Senator REED. Right.

Mr. GATES. "You did a good job. You did not do a good job."

Senator REED. Right.

Mr. GATES. It's kind of like in healthcare, where you say, "This expense is reasonable. This expense is unreasonable." Who's willing to stand up and say, "Yes, I made that choice?" And, in terms of saying to a teacher, "No, you need to go under remediation," or, "No, you've been in remediation three times. You're not the right

person for this career," that's, in a political sense, very, very difficult.

Senator REED. Right.

Mr. GATES. But all these merit-based systems involve those judgments being made. No matter what the source of the money is, that really needs to happen.

And in all these educational things, you have to always be careful, because when you create new schools, you often attract—even if you have no criteria for it, the better teachers will just show up there, and the better students will just show up there. And so, when you look at these results, you have to be very careful that you're not just seeing that effect, as opposed to some new approach. That's partly why we've gone, in the Foundation, to 1,400, and it'll get up to about 2,000, high schools, a large enough number that it's not just a few good people or that effect. There's some big cities, including New York, Chicago, and Washington, DC., where we're trying to do things on a large scale.

Some things are less controversial, like having the smaller high schools or having the theme-based high schools. The pay-practice issues have been the toughest. And so, although there's been some changes—for example, in New York, the mayor took some of the worst things of the seniority system, of people being able to bump other teachers around, and was able to override that. Most of what we're doing is more about curriculum and structure. And, so far, although we'd love to have it be about it, it's not been so much about the teacher evaluation.

Senator REED. Thank you very much.

Thank you, Mr. Chairman.

The CHAIRMAN. Do you remember who was your best teacher when you were growing up?

Mr. GATES. Yeah, I hate to say it—I went to a private high school, myself.

The CHAIRMAN. OK.

Mr. GATES. But, yes——

The CHAIRMAN. But, I mean——

Mr. GATES. Absolutely.

The CHAIRMAN. You remember who the teacher was. Was that person the person with the most degrees? Or was it——

Mr. GATES. It was a person who understood science—one science teacher, one match teacher—who loved the field. That is, they had a college degree in the subject, but they also were interested in following the subject and just loved the idea that somebody else was interested in what they were interested in. So, it's—that engagement certainly made a huge, huge difference for me.

The CHAIRMAN. That's good.

Senator Burr.

Senator BURR. Thank you, Mr. Chairman.

You remember who was the strictest teacher you had?

[Laughter.]

Senator BURR. Part of the challenge that we've got is that we've got a generation of kids that are relying on us to make the right decision. And I want to thank you for your willingness to come in. More importantly, I want to thank you and your wife for your passion for education, but also your investment in education.

I think, this weekend, you might have spent some time with the president of our university system, and your wife is familiar with Duke University. You know about higher education in North Carolina. I want to talk about high school, because I think that should be our passion today.

You made a statement in your testimony, "The goal should be that every child should graduate prepared to go to higher education or to work." And the need to transform America's high schools for the 21st century. Let me ask you, do our expectations for high school students limit our ability to transform the system?

Mr. GATES. Absolutely. The low standards we have today allow us, (a) to think we're doing better than we are, and they don't challenge the students. One of the most amazing things about these early college schools is, they're taking the kids who did poorly, and, by asking them to do literally more than they were doing in the school they dropped out of, a very high percentage of them rise to the occasion. They were essentially bored. It wasn't hard enough for them in the high school that they were in. And particularly if it's curriculum that gets connected to—"This is what you need to do to achieve some job that you're interested in." It works amazingly well.

There's been a move afoot to raise the standards, the State-level standards for high schools—North Carolina's been a leader in this—to say that you should have 3 years of mathematics, and that those math classes shouldn't be just balancing the checkbook. So, in the last couple of years, I think it's almost 30 States now have raised their high school standards. It's still not where it should be.

Senator BURR. I want to emphasize something that you said, that the boredom—the dislocation of students is not always because they just don't want to be in class, and they don't want to learn. In many cases, it's because they're not challenged enough. And that's one of the unique things about the Gates high schools. I found that it engages every student at a different level, and it engages them as a team, in many cases.

Should States consider, those that haven't, raising the age that one can voluntarily disengage from a high school education from 16 to 18?

Mr. GATES. Well, I don't know about that. I mean, the question is—okay, say you raise that age. What are you doing to that 16-year-old? Are you going out and finding him and handcuffing him and dragging him in? I mean, these—this issue of these demotivated students who just aren't connecting is a very tough problem. One of the things that's happened in all the high schools we back is, we make them small high schools. And what I mean by "small" is that the total high school size is about 500 to 600. And that's very different than the big high schools that get up in 2,000 to 3,000. In those high schools, the goal is that every adult knows every student, and—so that when you're walking the halls, they say, "Hey, you're supposed to be over there," or, "Hey, I heard you didn't turn your homework in," "Do you need help?" And so, if you create a smaller social environment, then it really changes the behavior in the high school. You don't think, "OK, I'm just a motorcycle-gang guy. I'm not supposed to work hard," and you only end up with this small percentage who are the hardworking stu-

dents. So, this small size, although it's still somewhat controversial, looks like it's making a big difference. And the nice thing about that, it's not more expensive. You may need to pool some things for the sports program, but it's not an increase in expense. And so, that's one of the few things we've found that we think really does draw the kids in and create relationships that have expectation that get them to step up.

Senator BURR. Great. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. Senator Sanders.

Senator SANDERS. Thank you very much, Mr. Chairman.

And, Mr. Gates, let me add my voice to those of the other Senators here in applauding you not just for the huge amount of money that you have provided all kinds of groups, but the innovative quality of your Foundation that you and your wife head, and not just in the United States, but all over the world. You've done an extraordinary job, and I applaud you.

Now I'm going to take a little different tack than some of my colleagues. And I want to know how you're getting along with your dad. Because when we talk about many of the challenges that we're facing, we have to do it within the context of a country which has an $8-trillion national debt. And I certainly agree with you that we need more innovation in education in a whole lot of areas. They're going to cost money. So, let me ask you a question. Your dad and Warren Buffett and others have been very loud and articulate in saying that repealing the estate tax, which would cost us about a trillion dollars over a 10-year period, is not a good idea, that some of the wealthiest people in this country are doing just fine, they don't need, for their families, that additional wealth that repealing the estate tax would provide. Do you agree with your dad that repealing the estate tax is not necessary?

Mr. GATES. Well, I think there are very few people who speak out for a tax. Many people come and like I have today, said, "OK, research is more important. We need to spend more on that. Education, although the Federal piece is only a small piece of it, there probably needs to be more put into that." So those things do create budget challenges. In my dad's case, he's actually saying that there's merit in terms—for a number of reasons, including the revenue raised—of that tax being preserved.

I, myself, in terms of speaking out publicly, have chosen the innovation issues that are key, and trade issues that are key for Microsoft, and the global health and education issues that are key to the Foundation. So that's a lot, and those are the things where I'm speaking out as much as I can.

I do agree with my dad. I think what he's doing there has got a lot of merit. He, together with a colleague, wrote a book about the issue, which actually, after I read that, I was—I thought there were a lot of good arguments in there that I had not heard before.

Senator SANDERS. I won't ask you what your kids feel about it, but——

[Laughter.]

Senator SANDERS. You do agree with your dad that repealing the estate tax is not a good idea. Is that what I'm hearing you say?

Mr. GATES. Yes. In terms of speaking out, I've picked global health, education, and some key innovation issues around Microsoft as the ones that I'm developing expertise and really putting the time into, but I think what my dad has done is right, and if I had a vote on it, I would agree with——

Senator SANDERS. Thank you.

Mr. GATES [continuing]. What he's saying.

Senator SANDERS. Thanks very much.

Let me ask you this. And this is a sensitive issue and a touchy issue. I think there is no disagreement on this committee or in the Congress that, as a Nation, we're doing a terrible job in math and science, that it is a disgrace how few engineers we are graduating. And you have done a fantastic job in focusing on that issue. But there is another side of the coin where you and I may disagree, and I'd like your comments on that, and that is the issue of outsourcing. And that is, my understanding is that from January of—this is quoting from the Bureau of Labor Statistics—that from January of 2001 to January of 2006, the information sector of the U.S. economy lost 644,000 jobs, etc., etc. Also, I think you would probably agree that many major corporations, including your own, if they can hire qualified labor—engineers, scientists—in India or China for a fraction of the wages being paid in the United States, they're going to go there. And we have quotes from people like Andy Grove and John Chambers, leaders in information technology, who basically predict that the IT industry may end up in China. Now, how do you address that issue, understanding we are in agreement, all of us are, the need to do a heck of a lot better job in education, high school education—math, science. But isn't there still going to be a lure, unless we get a handle on it, that companies are going to be running to China and India for qualified workers who are often paid a fraction of the wages that they are in the United States?

Mr. GATES. Well, the demand worldwide for these highly qualified engineers is going to guarantee them all jobs, no matter where they're located. So, anyone in the United States who has these skills, no matter whether they were born here or came here, not only will they have a super-high-paying job, there will be many jobs created around them that are also great jobs. And so, we should want to have as many of those people be here as possible, and have those jobs that are created around them. We've been increasing our employment in the United States, and a limiting factor for us is how many of these great engineers that we can get here. And yes, that does cause a problem.

The IT industry, I guarantee, will be in the United States to the degree that these smart people are here in the United States. And that's why I think it's important to maximize that number.

By and large, you can say, Is this country a beneficiary of free trade? And the answer is overwhelmingly yes. Why can our inventions—whether it be drugs or movies or software or planes—why can we invest so much in those products? It's because we're able to sell them into a global market. And by having people of this skill level, we can have an economy that has very high defense costs, very high legal costs, very high medical costs, and yet continue to capture our fair share of the economic improvement that takes

place. If we do things that artificially shut off our ability to engage in that trade system, then the impacts on our leading industries would be fairly dramatic.

So we love these high-paying jobs and our industry has continued to draw people into these jobs. We pay way above the prevailing wage rate because of the shortage that we see.

Senator SANDERS. OK. Well, thank you very much.

The CHAIRMAN. Senator Isakson.

Senator ISAKSON. Well first of all, I want to thank you. In my company, in the 1980s and 1990s, I credited you with doubling the productivity of my employees and my agents. Microsoft is just—Windows is just a phenomenal product. And all of us, the whole country, has benefited from your innovation. Which reminds me of a quote of Robert Kennedy's years ago when he made a pretty well-known famous speech in Biafra during the African famine, when he said, "Some people see things as they are and ask why, others see things as they never were and ask why not." You obviously are a "why not" guy. I mean, nobody could have envisioned Windows without having had a vision to say, "Well, why not?"

What is it about this country that you attribute contributing to your can-do spirit and your ability to envision that? This is a great country. We criticize it a lot of times. I think it's good, also, to—I don't think you could have done what you did anywhere else in the world but in America. So, I'd like to hear from you, who did that, some of the good things about this country.

Mr. GATES. Well, absolutely. The success that I've had, and that Microsoft has had, has benefited immensely from unique characteristics that this country has. These are characteristics that the country continues to lead in. They're not unnoticed by others. But if we renew those strengths we can stay in the leadership position.

The quality of our universities is high on that list. I personally went to a great high school. I attended some years at Harvard University. I didn't graduate, but I still had some——

Senator ISAKSON. You're a famous dropout.

Mr. GATES [continuing]. Some——

[Laughter.]

Mr. GATES [continuing]. Benefit. And then, I proceeded to hire lots and lots of people from the great universities. And these were people who were willing to take risks. It was actually during the 1980s, the country was, sort of, worried about Japan. But that was actually the time when the Internet, which benefited immensely from research funding from the U.S. Government, was actually becoming the standard, not just for computing, but for information sharing and an efficiency in the entire world economy. So, certainly in the 1990s, and even today, we're the envy of the world, in terms of how many jobs our economy's created. We have, by many measures, record-low unemployment. Despite some imbalances, our economy's continued to do very well.

When you go overseas, people look at our university system, and they say, "Well, you've got alumni that give money. How do we duplicate that?" When they look at social services, they see that philanthropy is widespread at all levels of income, not just at the highest levels; but philanthropy is a value that is very strong through our citizenship, and other countries don't have that nearly to the

degree that we do. And that engages citizens in seeing what the nonprofits are doing, what the Government can do better, and gets an active dialogue that allows us to be smart about those things.

Protecting intellectual property, including the patent system, the copyright system. Yes, you can read about how people want to reform and improve those things, and we're one of the advocates for tuning those systems, but, fundamentally, incentives to invent are very strong here, things like the bidual provisions that allow even work done under Government-funded research, that there's some royalties for the inventors in the university. Other countries have been very slow to match that, and that's benefited us in a great number of fields, particularly in fields related to biology.

So, we build on a foundation of strength in these issues. But when you see us turning away these graduates from these great computer science departments, and force them to go back, you say, "Wow," "is that renewing the magic that's put the country in that top position?"

Senator ISAKSON. Thank you very much.

The CHAIRMAN. Senator Brown.

Senator BROWN. Thank you, Mr. Chairman, very much.

And, Mr. Gates, thank you for your unprecedented work on combating global poverty, especially infectious disease. Not since—fellow Ohioan—I think you're a native of Ohio also, if I remember right—fellow Ohioan, Dr. Henderson organized the worldwide project to eliminate smallpox. I think your work since then has been the greatest—yours and your wife's and the Foundation's—the greatest contribution to global health and—of anybody since Dr. Henderson.

I want to shift to something a bit different. When I hear you talk about—thank you for your comments about protecting intellectual property. I think that's a very important thing that we, as a Nation, need to do. I want to talk about international health a bit. And I think that the strength of our economy in this country over the last century has been that we, as a Nation, have shared in the wealth—the workers have shared in the wealth they've created. We've done that through trade unionism, we've done that through education, we've done that all under the umbrella of a democratic system of government, so people that are productive have shared in the productivity and shared in the wealth they've created. Our trade agreements have not worked so well in the same direction. And I know you and I have very different opinions about trade. But I look at just a year or so before the time when you began Microsoft. We still had a trade surplus in this country. Today we have a trade deficit of approaching $800 billion. We—in terms of what you've done for international health and what we need to do for international health, when I look at our trade policy, whether it's Mexico or whether it's multilaterally, we simply haven't found a way to help those countries really share—those workers share in the wealth they create. And that means they've not established a healthcare system, they've not been able to bring up standards of living, because those workers, without labor standards, without environmental standards, without the kinds of things that we've done in this country—again, because of trade unionism, because of democratic government, because of education—that we've been able

to lift people up. Discuss for a moment how we should revise our trade policy. You talked about—and don't go into the—I mean, that's just a whole 'nother issue. But, just generally, our trade policy, what we should be doing to lift standards in the developing world. So, your efforts on healthcare, your efforts, from vaccines to combating TB, malaria, and AIDS, and all that, can build on a foundation of a better structural healthcare system in the developing world.

Mr. GATES. Well, in terms of trade, we've seen the results of countries like, say, North Korea, that chose not to engage in the world trade system. And, we can compare, say, South Korea and North Korea—one is a trade-oriented country, one's a nontrade-orientated country—and see what sort of outcomes come out of that. So, yes, I am——

Senator BROWN. With all due respect, that's an outlier. Let's talk about countries we deal with—poor countries—South—North Korea is——

Mr. GATES. OK.

Senator BROWN. OK. Fair enough.

Mr. GATES. Health conditions in Mexico continue to improve quite substantially. One of the consultants to our Foundation, Julio Frank, was the Secretary of Health down there, and they've done a number of very innovative things, including payments to poor families relating to following health practices and keeping their kids in schools. And, in fact, that's an approach that now other countries are looking at, where you use economic incentives to get poor families to engage in these things.

Health statistics are—worldwide—are improving quite a bit, even with some negative trends—of course, the AIDS epidemic is very negative; drug resistance, in the case of malaria and TB, are negative things—but, despite that, overall health conditions are improving quite substantially. And, for example, measles, back in the 1970s, before widespread immunization, actually killed 6 million people a year, children. And now, it's down under 600,000. And so I see a very positive picture in global health. It's one that we need to invest more in an accelerated—in a faster way.

Having jobs in those countries, and not over-regulated so they can't create jobs in those countries, is one of the best things. The commodities boom has been a great thing for a number of African countries. The exports of coffee, even some products like cotton that are extremely distorted by subsidization policies, there's been increases in the exports of those things. And that is a great development. Because, in the long run, you've got to have the agricultural productivity, and that means you've got to have exports. Most countries that have gotten into the virtuous cycle, have done it by being allowed to export and participate in the free-trade system.

And whenever we look at the standards for these countries, we should say, "OK, when we were at their level of wealth, what were we doing on the comparable things?" It's always an interesting comparison to make.

Senator BROWN. But when we were at their level of wealth, we didn't have an outside economic power with the kind of influence that American corporations did playing in our country, to the degree that many of them do in ours.

Mr. GATES. I'm not sure what you're saying. I mean, the United States, economically, was way behind Europe in its early days. It benefited from investment and trade. You know I believe in trade.

Senator BROWN. As I do.

Mr. GATES. You know the Doha round, in particular, would be quite beneficial to the African countries, where our Foundation focuses a lot of its efforts. So, I'm very hopeful that something can happen there.

Senator BROWN. If I can make one more comment, Mr. Chairman, on the question with Julio Frank, in Mexico, the AMA said the area along the U.S./Mexican border is the most toxic place in the western hemisphere, because we had no environmental standards—real, enforceable environmental standards in American companies and other companies on—near the Mexican border, south of the border, in terms of disposal of waste. And there's no reason we shouldn't—I assume you'd agree with that—no reason we shouldn't build that into trade agreements. That's not a trade barrier, any more than intellectual property is a trade barrier, I don't believe.

Mr. GATES. Well, when we have a common river like the Rio Grande, or something like that, certainly we have a very close interest in it. I'm not an expert on that issue. Some basic environmental things clearly are of global interest.

Senator BROWN. Thank you.

Thanks. Thank you, Mr. Chairman.

The CHAIRMAN. Good.

Senator Hatch.

Senator HATCH. Well, thank you, Mr. Chairman. Welcome back.

I just want to make one comment, and that is that I hold you and your wife in high regard. You've done so much with your wealth that is so good for mankind that I don't think anybody should fail to recognize that. I just wanted to be here to tell you that, because I usually don't lavish praise on anybody, but I think you deserve it. And anybody that can get Warren Buffett to commune with all this, where he's a mutual friend, and, I've got to say, one of the most brilliant people I've ever met in my life, as you are. But I'm just very grateful to you for what you're doing in so many ways.

Let me just say one thing. I'm also pleased with what you're doing with Medstory. You acquired that company, and I think that you can do an awful lot there to help people all over the world.

I'm not going to ask you any questions, I just wanted to personally express my regard for you, and for your wife, and for Warren, and for what you people are doing. You just really are making a difference in this world. And I agree with you—with virtually everything you said in your statement. I think that it's a very precocious statement, and very much appreciated by all of us here.

Thank you, Mr. Chairman.

Mr. GATES. Well, thank you. Medstory, for people who don't know what it's about, letting consumers find health information. And the interest in that has risen, and they were—did some very innovative work to make it easy to find medical data. So, that's become part of our new investments in that medical area.

Thanks for your comments. Warren has been incredibly generous, so now we have to justify the trust that he's put in us.

Senator HATCH. I figured that would be a very good combination. But I just raised Medstory, because a lot of people don't know about it, and it's an innovative thing that I think can make a real different in healthcare all over the world.

Thanks. I appreciate it.

Mr. GATES. Super.

The CHAIRMAN. Senator Roberts.

Senator ROBERTS. Thank you, Mr. Chairman.

On page 6, Mr. Gates—and I guess I'm showing my bias if I say mega-dittos in regards to all the accolades that have been mentioned to you, and all of them——

Mr. GATES. Thank you.

Senator ROBERTS [continuing]. Well deserved.

On page 6 of your written testimony, you say the problem begins in high school. International tests have found our fourth-graders among the top students in the world and above average in math. By eighth grade, they move closer to the middle of the pack. By the twelfth grade, we're down at the bottom. My question to you is, Why? I think you answered a little bit—this is the Enzi question—really, by saying that your favorite teacher was somebody that made math pertinent, or it was relevant, as opposed to math for math's sake. And you could also include science in that category.

Why is it that China and India are getting their students to be so terribly interested, at a young age, in these academic pursuits, but somehow we can't generate the intellectual curiosity in math and science from our adolescents?

Mr. GATES. First, to be clear, the comparisons there, where we go from the top to the middle to the bottom, those are against the industrialized countries, the rich countries.

Senator ROBERTS. Right.

Mr. GATES. So, Korea would be part of that, Japan, Singapore, the Nordic countries. Among the top are countries like Korea and Singapore.

India and Japan, as you say, are getting a higher and higher percentage of their students going into science and math. They're the only countries where you see significant increases. Europe, the United States, Canada has all seen these decline. So, whatever we're doing about making the field interesting and attractive and showing the opportunity, there's something shared across a lot of the rich countries.

India and China, to some degree, as was mentioned, they don't have—these are the professions that are most admired and that people are most excited about. They don't have the equivalent of Wall Street or other things.

Senator ROBERTS. Well, how do we generate that excitement here?

Mr. GATES. Well, to some degree, this is a—I'm very surprised we haven't been able to do better on this, because these jobs are very interesting jobs. Perhaps the image of them is that they're not very social. But, in fact, if you're designing a software product, you're working with a lot of people, you're getting a lot of feedback. We've worked with a number of universities, including a group called the Anita Borg Institute, to really go down and talk to high-schoolers and ask them what did they think about this field. And

the misperceptions are a real problem for this. When we show them examples, particularly examples they can relate to—so, showing the women a woman who's very successful, she comes out and shares her enthusiasm—that can make a big difference.

Senator ROBERTS. OK, pardon the interruption. Senator Reed——

Mr. GATES. Go ahead.

Senator ROBERTS [continuing]. Mentioned teachers. You can't teach in the secondary school, because you don't have a certification, and it takes 5 years. And yet, I would think you'd be a pretty good teacher in regards to science and math, not only because of your reputation, but it would make it real, it would make it pertinent, they could touch it, they could feel it. It would become exciting, as opposed to, "I have to take math courses." Is there some way that we can arrange to shorten up that certification process to let people like yourself, in the military or the business world or whatever, who say, "Well, I've had a career here. I'd like to at least teach, but I can't teach in a secondary school." Now, you could in a university, which I'm sure you do all the time. What's your comment about that?

Mr. GATES. Yeah, I definitely think that, particularly where we've got this huge shortage, and, as you say, the benefit of somebody who's engaged and excited in the field makes such a difference that perhaps making it simpler for them to come in, either as a full-time teacher or even, in some cases, come in to the schools, on a part-time basis and talk about the things they do, and be part of that teaching process. I absolutely think we need to encourage a lot more openness and a lot of experimentation in that. We're seeing some of it in some of the charter systems that we're involved with, but that's one of the regulations that even the charter system often doesn't let you get——

Senator ROBERTS. I understand that.

Mr. GATES [continuing]. Get around.

Senator ROBERTS. On page 10, you say, "I appreciate the vital national security goals that motivate many of these policies." We're talking about immigration. "I am convinced, however, we can protect our national security in ways that do less damage to our competitiveness and prosperity." How? As a former chairman of the Intelligence Committee, I'd just like to hear your comment.

Mr. GATES. Sure. As part of this immigration process, at many, many different points during the process you undergo a security check, the same person, many, many times. If they actually go up to Canada briefly, they often can't get back into the United States, because these security checks are now taking months to take place. It's done on a very manual basis, without much resources. In fact, it's done in a way that one doubts that it's working very well——

Senator ROBERTS. Yeah, that it's working.

Mr. GATES [continuing]. At all. And so, I think that some of the humiliation and delays that come through the security-check process could be eliminated without dropping the goal of being able to check a list or whatever the security concern is there.

Senator ROBERTS. I appreciate it very much.

Thank you, Mr. Chairman.

The CHAIRMAN. Yeah.

Senator Allard.

Senator ALLARD. Thank you, Mr. Chairman.

I would like to join my colleagues up here in their accolades for you and your wife and the Foundation.

I want to delve into this issue about performance levels at high schools and elementary schools. I agree with you that we need to be very concerned about what is happening at the high school level, but I think we have to be careful by saying that, because students are performing well, that's where their area of interest is going to be, and that we need to say, "Well, if you're interested in science, for example"—and I'm a scientist—we have to catch their fascination. We've got to—they have to—somewhere at that point in education, they've got to view science as magic, or math as fun. I happen to disagree with my colleagues, that, even though they're performing well, that they start in the elementary school. I mean, it's the third, fourth, fifth grade that you kind of say, "well, because of somebody you know"—in your case, maybe a teacher. I don't know where your fascination started, but my fascination started in science when I was in fourth and fifth grade, because of people I knew and interacted with.

I think, somehow or the other, we need to get teachers in those grade levels excited about it, so they can share that with their students. Also, I think we need to figure out a program that gets elementary schools—teachers excited. The reason they teach there—I think science is intimidating, and they get into the heavy science courses—or heavier science courses in college and high school. And I think the seed needs to be planted at the elementary school.

Have you given that any thought? And would you have a comment on what I just said?

Mr. GATES. Well, I agree with you that elementary school is where we start to lose people. It's not where we lose the bulk of the people, but having teachers at that level who can make the subject interesting and fun, and not have people self-label as though "I'm not one of those people who likes math." "That's that"——

Senator ALLARD. Yeah, that's a problem.

Mr. GATES [continuing]. "Geeky guy"——

Senator ALLARD. Yeah.

Mr. GATES [continuing]. "Over there." That labeling, there's some of that that happens in elementary school, but it gets way more extreme in high school. And I think the thing that characterizes a great elementary schoolteacher is more about their teaching technique and less about their depth of knowledge in the subject. So, yes, I think there should be a focus there.

The place where we really need people who majored in the subject in college and have a pretty in-depth knowledge of the subject, that's more as you move up to the higher grades, that if you're going to teach algebra and geometry, that they are very comfortable with the ninth- through twelfth-grade curriculum. So, I think what we—what's beneficial to teachers to have them keep kids interested is somewhat different at these different levels, and our expertise, because the foundation is focused on high school, is much more at that level. But you do see a dropoff in elementary school. You see it in high school. And then, there's a huge dropoff,

people who enter college thinking they're going into science and math——

Senator ALLARD. Yeah.

Mr. GATES [continuing]. That starts out at about, I think, 14 percent, and then it's less than 5 percent have followed through on that by the end of the undergraduate 4-year period.

Senator ALLARD. That's very interesting.

Coming out of the Sputnik era, when science was being stressed, we in the TV programming, had some fun science programs. I never was one that spent a lot of time in front of the TV, but I think we had those sort of programs. I'm wondering if there isn't some way, maybe on the Internet, to begin to establish an Internet location where you could have fun science. The fascination, for young people today, is not TV so much, I think it's more the computer and the computer screen. And if we can, somehow or the other, reach out to them and make a fascinating program and pull them into this idea of science. I think it might be something worth thinking about.

Mr. GATES. Yeah, absolutely. And Microsoft and others are very involved in getting this started. I think there's two flavors of that. One is the student who's motivated, who would actually go out there and say, "OK, let me see how volcanoes work, or how global warming works, or how spaceflight works." The other thing is to take and gather the material so that a teacher can go to those sites——

Senator ALLARD. Yeah.

Mr. GATES [continuing]. And then drawn down, kind of, the images, the animations, the stories, and bring those sort of real-life science neat stories into the classroom. And that ability of great—some great teachers have always been doing that, but they didn't really have a way of publishing and sharing their ideas, and then having other people build on those. By creating communities on the Internet of these various types of teachers and the material and things they're doing, or even videos of the best practice, there's a lot more we can do to make teaching less isolated, let them benefit from one another. And that spans all the way from the elementary to the collegiate level.

In the extreme case, we're actually seeing—we're saying to universities that—let's get all the great lectures online; and so, say, a community college wouldn't have to do the lectures in a subject like physics or chemistry, but they would do the study groups, and they—so, they would take the world's best lectures, but then do that. And so, education can be more specialized and more efficient as we use the technology.

Senator ALLARD. Mr. Chairman, thank you.

And thank you for your testimony, Mr. Gates.

The CHAIRMAN. Thank you. Thank you very much.

Mr. Gates, when you were talking about "interesting in science," I was up at the Museum of Science in Boston not long ago, and they had Mr. Ballard, who is a great oceanographer, found the Titanic and the Bismarck, and the Lusitania. And he was conducting—they had this submersible that—he was down in the Galapagos Islands, and steering this—letting the students steer the submersible through the Galapagos, with all of the sea life that

was there, and they had 600 inner-city children in that auditorium. You could hear a pin drop—absolute pin drop, the interest these children had. And then they had—I saw a fellow named Lesser, who was the principal cellist for the Boston Symphony Orchestra, talking about the sound, how sound moves through the air when he played his cello, in a room with 50 inner-city schoolchildren. And the fascination, the opening of the mind, about—interest by these children in both music and in technology and science—unlimited. How we get that kind of interest is going to be the challenge. But you've reminded us about this.

Let me quickly go into another subject. Mary Robinson, President of Ireland, head of the World Health Organization, met with a number of us. She's very concerned about just this brain drain to the United States, particularly in health, in health professions. She pointed out that the flow, for example, at a time when we have eight or nine applications for every nursing slot in my State of Massachusetts at community colleges, we can get one applicant that can take it, because we don't have the training facilities, we don't have the professors for the training of nurses. And we're considering an amendment on the floor now on the homeland security bill to increase the number of nurses on this.

Now, here are some of the countries. Nigeria, we have 2,500 doctors here from Nigeria, and 8,900 nurses. From South Africa, we have 1,950 doctors, 877 nurses. In Kenya, HIV rate, 15 percent, 865 doctors, 765 nurses. Ghana, HIV rate, doctors, 850, 2,100 nurses on this. Her point was, they—many of these countries around the world, so many of these doctors and the nurses, health professionals that are so vital, in terms—trying to deal with the challenges of healthcare, are here in the United States—are coming to the United States, working in the United States. This is costing these countries—they're training these people. It's an outlay for—training them. How do we balance this, versus what you've said about, sort of, the openendedness, in terms of having skilled people be able to come into the United States? What's really the—where do we—where do we really begin to draw the line? When do we say, "Well, we're going to try and invest more to develop more opportunities for Americans to become nurses, Americans to become the doctors of"—we have qualified people that don't get into our great medical schools or to our nursing. But what's the balance in there?

Mr. GATES. Well, the—when foreign labor comes to the United States, there's this incredible benefit to the country that they come from of the remittances they send back to the country. And that's a huge thing, in terms of bootstrapping those economies, letting them send kids back there to school, and having the right nutrition, and great things. So, I don't think the right answer is to restrict that ability to come and earn a high wage and have that go into the economy that they came from.

Clearly when you get shortages like that, the systems like the community college system are usually quite responsive in creating capacity and meeting that demand. I'm not an expert on the nurse situation in——

The CHAIRMAN. Yeah, that's OK.

Mr. GATES [continuing]. In this country. I do know that, as we think about global health outside the United States, and people have talked about this, this talent drain, I don't think putting restrictions on letting people come and work would be the way to solve that, because there's other countries that they would end up going to. And what you need to do is deal with the supply.

Also, many of the medical inventions that we need, need to be things that don't require an expensive healthcare system, because the reason many of those people are leaving those countries is that the healthcare system doesn't use their talents very well; that is, they don't stock drugs properly, they don't have electricity, and a number of these things. And so, getting those countries to invest in healthcare, and having things like vaccines that can actually be given without advanced medical training—for example, if we had an AIDS vaccine, which is a very tough thing, we'd greatly reduce the burden on those healthcare systems. In fact, if we had a malaria vaccine, that would have this amazing effect to free up that capacity for dealing with other health problems, because that actually puts more people in these hospitals in many countries than anything else. I'm optimistic about the vaccines coming along, and that those will change—get rid of the unbelievable overload in the health budgets of these countries.

The CHAIRMAN. Just one additional point. In the H-1B there are provisions in there where they pay a fee into a fund so that they train Americans and upgrade their skills as a part of the H-1B.

Let me, just finally, ask you this. You've given a number of recommendations on competitiveness, immigration, others, in education. What's your—just if you could summarize your sense of urgency—how much time do we have? I mean, what are we—what's the framework, where would you say, as somebody that's obviously thought about this a good deal, has specific recommendations, and is familiar with these forces in other parts of the world? What guidance can you give to us about the sense of urgency? I think for—all of us who deal with education think every day that's gone by with a lost child—for a child to lose that opportunity for learning is a day that probably can't be recaptured. There's a sense of urgency, in terms of education. Years go by, we lose these opportunities. What's your sense, just in terms of the country and competitiveness, what's happening in other parts of the world?

Mr. GATES. Yeah, I think both of these are incredibly urgent issues. Education, because, as you say, it takes a long time, and so, you might—you've got to get started now, improving the teachers and trying out the new incentive systems. Even if it's going to take decades, the sooner you get going, the better.

In the immigration case, it's much more of an acute crisis, in that the message is clearly here today that you come to the United States, go to these great universities, and you go back, and not only take your very-high-paying job, but also all the jobs around it back to another country. Other rich countries are stepping up and showing the flexibility to try and benefit from the way we're turning these people away. This country benefits in every way by having these very-high-paid jobs here in this country. If you talk to a student who's in school today, going to graduate in June, they're seeing that they cannot apply until they get their degree, and, by the

time they get their degree, all those spaces are gone. If somebody's here on an H-1B, if you're from India, say, with a bachelor's degree, the current backlog would have you wait decades before you could get a green card. And, during that time, your family can't work, there's limits, in terms of how you can change your job. There was one calculation done that you—the fastest way to get a green card is to have a child who becomes a United States citizen, and then your child sponsors you to become a U.S. citizen. That's because it's—there's more than 21 years in some of these backlogs.

So, this is an acute crisis. And it's a thing—as you say, there's fees paid. And Microsoft makes no complaint about those fees. We end up paying a lot more to somebody who comes in for these jobs from overseas than we do to somebody domestically. We have every reason—we have 3,000 open jobs right now. We're hiring the people domestically, every one that we can. In fact, there's a great competition. This wage rate continues to go up, as it should. And the wage rate for this type of skill set is not that different in other countries. It's escalated very rapidly in India and China, and particularly if you include the tax costs and the infrastructure costs that we pay to support this kind of job in those countries. This is not about saving a ton of money for a top engineer, this is about being able to put them here in this country, where the other skill sets around them are the best in the world. And there's not a shortage in those other skill sets. India and China haven't yet, and it'll take them a long time before they're as good at the management, testing, marketing elements that go around those engineers.

So, this is an acute crisis, and one that, in terms of the taxes these people will pay, the fees that get paid around them, is fiscally accretive to the United States immediately, in terms of what happens. To me it's a very clear one with basically no downside that I can see whatsoever.

The CHAIRMAN. Good. Lamar.

Senator ALEXANDER. Thank you, Mr.——

The CHAIRMAN. Senator Alexander.

Senator ALEXANDER. Thank you, Mr. Chairman.

Two comments and a question. One is, you've been a very eloquent spokesman for what I like to characterize as insourcing brainpower, and, I think, helping our country understand that insourcing—we talk a lot about outsourcing jobs, but insourcing brainpower is insourcing jobs, too, which is a—which you've said several times today, and which is a point we don't make as well.

Second comment. In our little discussion about teacher incentives, where we were talking about this area—this difficult area of finding fair ways to reward teachers and school leaders who excel, and that how a good way to do that is not to impose, suddenly, a big system, but to encourage this effort across the country, where communities are, as a—New Leaders for New Schools is, in Memphis, for example, and they pay a third of the principals $15,000 more if they go to Wharton and learn—and they stay a part of the system and learn to be leaders. And the teachers make $6,000 more if they're highly effective teachers and their low-income kids improve. So, the point being that one of the big differences between today and 20 years ago is that we now have a number of ways to measure student achievement. Dr. Sanders was at the meeting

Senator Kennedy hosted yesterday. And there are other methods. And because we're now able to say, "This low-income child in a New York school is making great progress because this teacher consistently helps that," then there's a—perhaps a fair basis for rewarding that teacher or that school leader. Because we can see improvement.

And so, I hope—the reason I bring that back up—and here's my question—is because that's a scenario where I think we can hopefully move ahead with a teacher incentive fund, and perhaps you and others in the private sector can do the same over the next 5 years, and we can work in parallel and learn from one another.

Here's another area. We have long lines at two-thirds of the places around our country of people who don't know English, who want to learn English. Now, I'm not talking about making people learn English, or English only. I'm talking about the huge number of people who live here, who don't speak English, who want help learning English. And the Senate adopted my amendment to give $500 grants to prospective citizens who want help learning English so they could take it to the PUENTE Learning Center in Los Angeles or other places, where, for $500 you can learn English pretty quickly.

So, I've had on my mind for many years, and I'm going to put this in legislation, but it'll be hard to do in government, that if we had $100-million bank, or 200 or whatever amount, and we said to virtually anyone who's living in the United States, "If you want help learning English, we'll give you a $500 voucher, which you can then spend at any one of—at any accredited center for learning English, with the hope that you'll 1 day pay it back." My—"no strings, just with the hope that 1 day you'll pay it back." My guess would be that that bank would grow, over 5, 10, or 15 years, to be a very big bank that would turn over and over and over again, providing an easy way for people, who needed a little help, to learn English. So, I wanted to take advantage of you today by—since you're here—by suggesting that idea to you, that I'm going to introduce it in legislation here, but it'll have—it'll run into a lot of problems if we try to set it up, with all the government rules and regulations and accounting. As a purely private matter, a bank to help people learn English, which we hope they would pay back, I think would be—help equal opportunity, it would help improve our workforce, and it would be a big help toward national unity by encouraging our common language, but not in any sort of coercive way.

Mr. GATES. Yeah, in terms of teacher's innovation fund, I'm—as I said in my comments, I'm a big believer in that, because having the money that lets you try out merit pay be viewed as incremental allows people to go along with it, even if, in the early days, they think, "OK, the system is unproven," and they're worried about that, at least they're not being told, from the beginning, "Hey, we're taking it"—it's purely zero-sum, even when the system isn't proven. The fact that during that experimental phase, it's incremental, then they see that they are not a loser, and they see, "OK, here's Federal money that we don't get unless we do a merit-based system," so it'll encourage experimentation. And I do think there are—in these labor-practice areas, we should have 100 such experiments, because I think 90 of them won't work. We're certainly not

at the point where you can test people going into a class—have them take a class, and test them going out, and just pay the person based on, "OK, here's the delta in those test results." It's too—the testing is good. We know a lot more. But at that level of granularity, it's not viewed as predictable enough to put a huge reliance on it. And so, figuring out, "OK, how do we supplement that? Do we have teachers who come in and do evaluations anyway?" A lot of things should be tried there.

Terms of English, it is one of the advantages the United States has. English is being adopted as essentially the second language globally. Every country I go to, they're saying how they've changed their education system to teach English at a younger age, and they're proud of the percentage of people in the country who speak English—not as a primary language, but as a second language. And so, that is helping us. The demand for English training as you say, actually demand is very high today. People are moving to do that. There are some things on the Internet that can help with that. There's some self-training courses where the prices of those have come down.

I haven't thought about a way of encouraging people to do that. It would be interesting to think, would you actually have a lot more people who would learn because of that incentive? What follow-on benefits might you get from that? Obviously, as you think of different age groups, it's different. Kids going into school, we want them to get comfortable in English very quickly, because that could be a huge challenge to a school system. And many of these urban school systems, it's unbelievable the variety of languages that they have as native languages. It's great, but it's a challenge for them. You need some innovation and encouraging it would be good. For young people, it's really actually quite necessary for them to benefit from the education system.

Senator ALEXANDER. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Sanders.

Senator SANDERS. Thank you, Mr. Chairman.

Before I ask Mr. Gates a question, I did—wanted to comment that I thought your statement on nurses was right on. My understanding is that we have some 50,000 Americans or so who want to go to nursing school in the midst of a nursing crisis, and can't get in them, because we don't have nursing educators.

The CHAIRMAN. Yeah, you got it.

Senator SANDERS. And, in fact, that's what I want to talk to you, on Friday, about the higher education bill. Just——

The CHAIRMAN. We'll do that on Friday. And be——

Senator SANDERS. Right.

The CHAIRMAN. I'm sure Mr. Gates will be interested.

[Laughter.]

Senator SANDERS. All right.

Mr. Gates, there—I think there is no debate that we have got to focus a lot of attention on urban schools. How minority kids are treated is a disgrace, and so forth. But what—I represent a very rural State, the State of Vermont. And, by the way, we'd love you to come up and say hello, visit us. It's only 20 below, today, but it'll warm up in a few weeks.

In rural America, and in rural Vermont, we have situations where there are not a lot of good-paying jobs. And kids don't really get a sense of why they need an education, because they don't see much in front of them. Kids are dropping out, kids are doing self-destructive behavior—drugs, crime, so forth and so on. What thoughts do you have about how we might be able to revitalize education and create excitement in rural communities around this country?

Mr. GATES. The Foundation schools, a very high percentage of them are urban schools, because that's where we've seen—where you've got the large minority populations, and you have these super high dropout rates. I agree with you that the rural situation is not some panacea. In fact, when we first got involved, I said, "Well, hey, if it's just urban, let's just copy what they're doing in the rural areas." And, in fact, as you say, it has some particular problems, in terms of the breadth of teacher skills. Often, for political reasons, school districts that should merge together——

Senator SANDERS. Yeah.

Mr. GATES [continuing]. Do not want to merge together, because that comes down to the point of, "OK, we should merge the schools to try to get scale," and that takes some political leadership, because there's a hard choice there about—as you have less students, how do you—how do you create that critical mass? So, I do think there should be a lot of school-district mergers—would help a lot in these rural areas.

There has been some work done by the Foundation in rural areas, and I'll get them to write that up and send you and I a copy of it.

Senator SANDERS. Good.

Mr. GATES. We do think that the—some of these technology things, where you can go and get great courses over the Internet, and have even rural areas sharing with each other, where one is very good at one thing, and one is good at another thing, that those can be quite advantageous——

Senator SANDERS. Right.

Mr. GATES [continuing]. Because—and in Vermont, you have good broadband connectivity. Most of the schools are hooked up. And so, it should be very possible.

Senator SANDERS. OK, thank you.

The CHAIRMAN. Just finally, we have—Mr. Gates, we have 77,000 jobs that are waiting—in my State of Massachusetts, probably 300,000 people are unemployed, and we've got 24 applications for every job slot existing today. I mean, under our existing—listening to you talking about upgrading our training programs and the education and ensuring people are going to be upgrading their skills, there's a lot of work for us to do.

This has been an enormously helpful hearing. You've raised all of our sights, and raised our spirits, as well. And we're going to be busy concentrating and learning from that extensive testimony, and absorbing those recommendations. And I think you've seen that the members of the committee have been enormously appreciative of your taking the time to join with us, and we look forward to keeping in touch with you as we move forward on many of these initiatives. We'll value very highly your ideas and recommenda-

tions, suggestions. And we have benefited immensely this morning. We thank you very much for taking the time.

The committee stands in recess.

[Additional material follows.]

ADDITIONAL MATERIAL

PREPARED STATEMENT OF U.S. REPRESENTATIVE BILL PASCRELL, JR., STATE OF NEW JERSEY

I would like to thank Chairman Kennedy and Ranking Member Enzi for convening this hearing on the vitally important topic of strengthening American competitiveness. I also want to thank the Chairman and Ranking Member for allowing me to submit my testimony on the need for comprehensive H-1B visa reform.

I believe we must evaluate all options to strengthen American competitiveness as we move forward. However, I feel strongly that any such progress must include reform of the broken H-1B visa system that is coming at the expense of American workers especially those in the IT sector. Major corporations are throwing labor standards out the window by abusing this program.

The facts are clear and staggering. U.S. electronic engineers and computer scientists have experienced higher levels of unemployment over the past 5 years than in the past three decades. In 2003, for the first time in history, the unemployment rate for these professions exceeded the national average. In fact, a study by the job placement firm Challenger Gray and Christmas Inc. found that 16 percent of all U.S. jobs cut this year were from high-tech companies. There are many reasons for the high levels of unemployment for our Nation's innovators, including the dot-com and telecom busts and the general business climate against hiring. However, it is apparent that the abuse of the H-1B visa program is a significant and growing cause of low demand for U.S. high-tech workers.

The abuse of the H-1B visa program has an obvious negative effect of the competitiveness of the American worker. High-tech workers who are laid off face extra burdens. They are more likely to be unemployed for an extended period of time, which means that they will lose hands-on experience needed to keep up with the fast pace of technological change. If a high-tech worker is out of work for 1 or more years, it is obvious that he or she will be losing skills more rapidly than another occupation.

In addition, the poor labor market is causing young Americans to shy away from technology disciplines such as computer science in significant numbers—students are responding rationally to what they perceive as diminished long-term prospects in those fields.

The poor labor market for tech workers is also causing wage depression. For the first time in three decades, yearly compensation actually decreased in 2003. It is clear that employers are using H-1B visas in order to pay those visa holders less than Americans of the same qualifications. INS data of 2001 wage estimates show that the median salary for computer-related H-1B visa holders is $50,000, while the corresponding median for American workers in similar jobs is $66,230.

The H-1B visa program plays an important role in the American economy when it is used as intended—to allow the hiring of skilled foreign workers when no American is available. The current misuse of the H-1B visa, however, leads to exploitation of foreign workers. They are vulnerable because of their immigration status, and are subject to termination if they speak up about their mistreatment.

In the 109th Congress I introduced the "Defend the American Dream Act" to address the gaping loopholes in the H-1B visa program. This legislation would protect American workers by reducing the H-1B visa quota to its original level of 65,000 per year. It would also substantially increase protections of American and foreign workers by requiring companies to actively recruit for American workers first and to pay all workers the median wage in that industry. Finally this legislation would greatly strengthen the Department of Labor's ability to enforce the law—which is today nearly non-existent—by allowing the Labor Department to audit and investigate companies and to apply substantial penalties to companies in violation.

I plan to reintroduce the "Defend the American Dream Act" this year as the number of American workers adversely affected by the H-1B visa program continues to grow exponentially. We must reform the H-1B program to give Americans the first chance at some of the best jobs in our economy. I will continue to work closely with my colleagues on the House side on this significant issue and likewise I look forward to working with members of this committee as we seek to undertake comprehensive immigration reform. In conclusion, I will always believe that any discussion on strengthening American competitiveness must begin and end by addressing the concerns of American workers.

AMERICAN FEDERATION OF LABOR AND CONGRESS
OF INDUSTRIAL ORGANIZATIONS (AFL-CIO),
WASHINGTON, D.C. 20006,
March 6, 2007.

Hon. EDWARD M. KENNEDY, Chairman,
Committee on Health, Education, Labor, and Pensions,
U.S. Senate,
Washington, D.C. 20510.

Hon. MICHAEL B. ENZI, Ranking Minority Member,
Committee on Health, Education, Labor, and Pensions,
U.S. Senate,
Washington, D.C. 20510.

DEAR CHAIRMAN KENNEDY AND RANKING MEMBER ENZI: I wish to express strong concern with the composition of the panel before the Committee on Health, Education, Labor, and Pensions (HELP) for tomorrow's hearing entitled "Strengthening American Competitiveness for the 21st Century." I am deeply disturbed that the panel consists only of Bill Gates and excludes the voice of workers. Working people just elected a Congress on a platform of economic justice; the least we expect is that workers will be given a voice on matters that are at the heart of that agenda. The way you have structured this hearing guarantees that you will only be given the corporate perspective on this important issue.

Mr. Gates will no doubt once again advocate the massive expansion of the H-1B guest worker program as a solution to keeping America competitive. We could not disagree more.

Simply put, there is no justification for massively increasing the size of the H-1B guest worker program, other than to continue to provide corporations a steady stream of exploitable workers. Thai runs completely contrary to an economic justice agenda and is not in the interest of workers in our Nation. Guest worker programs like the H-1B program are detrimental to all workers in the United States, both American workers and foreign workers who are imported through the H-1B program.

The H-1B program has become the preferred mechanism for employers in professional and technical sectors to keep labor standards from rising. As the National Research Council concluded, "the current size of the H-1B workforce relative to the

overall number of IT professionals is large enough to keep wages from rising as fast as might be expected in a tight labor market."

Congress adopted the H-1B program in 1990 as a means to assist employers in addressing a temporary labor shortage in high-tech industries. The program was never intended to address long-term labor shortages. Seventeen years later, as unemployment rates in the high technology sector have increased substantially, employers are still calling for more increases in the number of temporary foreign workers that they can import into the U.S. labor market.

The AFL-CIO repeats its call for policymakers to focus attention on the true solution to current and anticipated skills shortages in the high-tech and information technology (IT) sectors: training of current workers, investment in educational opportunities, and reform of our permanent employment-based immigration system.

The primary focus for policymakers and for industry should be to ensure that our workers are prepared for job demands of today, to predict future skills needs, and to encourage government, industry, and labor to work together to ensure that our workforce is fully prepared to meet those needs. Instead of tackling these important policy challenges, the simple expansion of the H-1B temporary foreign worker program shifts attention to a program with little agency oversight that is readily susceptible to fraud and abuse of U.S. and foreign workers alike.

The Government Accountability Office (GAO) has issued several reports related to the H-1B program. It issued a report in June 2006 that focused on Department of Labor (DOL) oversight of employers' compliance with H-1B program requirements, which are the only safeguards against abuse and displacement of workers. GAO concluded that the DOL "does not use its full authority to oversee employers' compliance with programs requirements" and that it "lacks quality assurance controls and may overlook some inaccuracies."

We recognize that even with necessary investments to training and educational opportunities in the fields of math and science for our domestic workforce, employers may still encounter long-term labor shortages. The answer to those shortages should not be the expansion of temporary worker programs that are failing American workers, but rather a reform of our permanent employment-based visa system.

The permanent employment system isn't working, mainly because it is based on a system of arbitrary caps that are the result of political compromise that have no relation to economic realities. The current number of visas available, for permanent jobs 140,000 per fiscal year, was set by Congress more than a decade ago and has not changed. While economic demands certainly have changed, the fundamental policy behind our permanent immigration system remains valid. Employers that demonstrate they cannot find workers in the United States to do jobs that are permanent (that is, not seasonal or temporary in nature) should be able to bring in foreign workers under conditions that guarantee that there will be no negative impact on the wages and working conditions of other workers in that industry. The key to protecting U.S. labor standards is to ensure that new foreign workers come in with fully enforceable rights.

It is irresponsible for Congress to contemplate yet another increase in the total annual number of H-1B visas available when it has done nothing to address the myriad and well-documented problems associated with the H-1B temporary worker program. Nor is it responsible for Congress to allow corporations to import more and more workers under conditions that have detrimental impacts on entire industries instead of focusing its energy on finding long-term solutions that involve access to training and educational opportunities for domestic workers, and on reform of our permanent employment-based immigration system.

Sincerely,

LINDA CHAVEZ THOMPSON,
Executive Vice President, AFL-CIO.

[Whereupon, at 11:35 a.m., the hearing was adjourned.]

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