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THE KEY TO AMERICA'S GLOBAL COMPETITIVENESS: A QUALITY EDUCATION

HEARING

OF THE

COMMITTEE ON HEALTH, EDUCATION, LABOR, AND PENSIONS

UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

ON

EXAMINING THE KEY TO AMERICA'S GLOBAL COMPETITIVENESS, FOCUSING ON A QUALITY EDUCATION

MARCH 8, 2012

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C O N T E N T S

STATEMENTS

THURSDAY, MARCH 8, 2012

THE KEY TO AMERICA'S GLOBAL COMPETITIVENESS: A QUALITY EDUCATION

THURSDAY, MARCH 8, 2012

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

The committee met, pursuant to notice, at 10:08 a.m., in Room SD–430, Dirksen Senate Office Building, Hon. Tom Harkin, chairman of the committee, presiding.

Present: Senators Harkin, Enzi, Hagan, Isakson, Bingaman, Franken, and Whitehouse.

OPENING STATEMENT OF SENATOR HARKIN

The CHAIRMAN. The Senate Committee on Health, Education, Labor, and Pensions will please come to order.

I'd like to thank all of you for being here today to discuss a topic of vital importance to America's global economic competitiveness and the opportunity individuals have to enter the middle class, and that is our public education system. What our children and grandchildren learn today will determine America's productivity in the future, and that depends on preparing them to compete in a global marketplace more competitive than at any other time in history.

But while globalization and technology have dramatically increased the skills and qualifications required to succeed today, our schools are largely geared toward the assumptions of a 20th Century workplace. I know we can't solve the problem overnight, nor can we solve it by simply asking more of American workers. Americans are already working harder than ever, but in recent decades, middle class family incomes have stagnated. In fact, over the last 10 years, the average income of working Americans actually declined.

The challenge before us is to ensure that economic growth translates into greater prosperity for everyone. That said, the path into the middle class is more than ever linked to a worker's level of educational attainment. According to the Bureau of Labor Statistics, the unemployment rate for people without a high school diploma in January of this year was more than three times higher than among those who had at least a bachelor's degree.

Unfortunately, this critical door to the middle class does not swing equally wide for everyone. Between the 1970s and mid-1990s, the college graduation rate of American youth from families in the top quarter of income distribution increased by 21 percentage points. However, over the same period, the college graduation

rate of children from families in the bottom quarter increased only 4 percent, from 5 percent to 9 percent.

In this day and age when two-thirds of new jobs created in this country require some college education, only around 10 percent of young people from poor backgrounds are graduating from college. This makes it very unlikely that they will achieve the American dream of a middle-class lifestyle.

The great American tradition is to invest in the next generation, to leave our children a world that is more advanced, with more opportunity. Other nations have also identified this strategy as their own path to economic success, as I read in Dr. Hanushek's paper last night. On the other hand, we in the United States have recently begun to expect less of our education system, and I question how we can remain globally competitive when we make choices like this.

Our witnesses today have different perspectives on this critical question of how best to recalibrate our education system for the economic challenges of the 21st Century, and I look forward to hearing more about their proposed solutions and to engage in some colloquies. Even more, I hope that we can come together in this committee and in the Congress to do what's necessary to give our Nation's children and workers the education and training they need in order to secure well-paying jobs in the 21st Century.

The challenge before us is framed very succinctly in a report issued last year by the Organization for Economic Cooperation and Development, the OECD, says,

> "The yardstick for judging public policy in education is no longer improvement against national educational standards but also improvement against the most successful education systems worldwide."

I think that just sums it up. We're in a worldwide market. We can't just measure it by what we're doing in our own country.

With that said, I'll yield now to my friend, Senator Enzi.

OPENING STATEMENT OF SENATOR ENZI

Senator ENZI. Thank you, Mr. Chairman.

Our children do deserve to receive the best education our country can provide for them. Yet too many of our students continue to be ill-served by the schools they attend and either fall behind or drop out of school. This is not good for their future, nor is it good for our country's future.

Our economy depends on an educated and skilled workforce to be successful in the global market. In the United States, we face two major challenges for students entering the workforce. First, a growing number of jobs require more than a high school education. Second, over the past 30 years, one country after another has surpassed us in proportion of their entering workforce that has at least a high school diploma.

Every day in our country, about 7,000 students drop out of high school. Even for those students who do stay in school and earn a high school diploma, there's no guarantee that they've learned the basics needed to succeed in post-secondary education and the workforce. In fact, nearly half of all college students must take remedial

courses after graduating from high school before they can take college level coursework.

This lack of preparation means that our college students spend more time and money in tuition just to catch up. It's hard for them and it's hard for our country to get ahead if we're playing catch-up.

Each year, more than 1 million students enter college for the first time with the hope and expectation of earning a bachelor's degree. Of those, fewer than 40 percent will actually meet that goal within 4 years. Barely 60 percent will achieve it in 6 years. Among minority students, remedial course participation rates are even higher and completion rates are even lower.

There's no question that some education and training beyond high school is a prerequisite for employment in jobs and careers that support a middle-class way of life. Lifetime earnings for individuals with a bachelor's degree are, on average, almost twice as high as high school graduates. However, the message has not yet resonated with the public at large.

A *National Journal* poll recently found that people ranked a college education fourth in importance behind raising a family and ensuring that their children had more opportunities than they had, owning a home, and being able to pursue a rewarding career. We must be very clear. A high school diploma and some additional education or training is necessary to be successful in today's economy. It's also important in order to achieve the very things that are ranked one through three in the same poll.

I do a little interesting experiment when I go into junior high schools. I like to ask students how much they think they'll make when they get out of high school. And the average student thinks with a high school diploma that they're going to make $45,000. I don't know what job they're going to get with that.

Once first in the world, America now ranks 10th in proportion of young people with a college degree. Less than 40 percent of Americans hold an associate or bachelor's degree, and substantial racial and income gaps persist. The projections are that within a decade, 6 out of 10 Americans must have a degree or a recognized credential to succeed in the workforce.

This being the case, we're facing a major deficit of skilled workers, which in turn threatens our ability to grow economically. We used to have the best educated workforce in the world. But that's no longer true. The Federal Government does have a role to play in improving the education of our Nation's children through programs supported under the Head Start Act, the Elementary and Secondary Education Act, Perkins Career and Technical Education Act, and the Higher Education Act.

The skills students learn in the earliest grades are the building blocks to their success in high school, college, and the workforce. Our country cannot continue to be competitive in the global economy if we do not have an educated workforce.

I want to welcome and thank all the witnesses who are here today, and I look forward to hearing from you.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Enzi.

We'll introduce our panel from left to right, and I'll yield to the Senator from North Carolina for the purposes of an introduction.

STATEMENT OF SENATOR HAGAN

Senator HAGAN. Thank you very much, Mr. Chairman, and also thank you and the Ranking Member for holding this tremendously important hearing today. I am proud to have the opportunity to introduce Jenn Mann, the vice president of Human Resources at the SAS Institute in Cary, NC.

SAS is the world's largest privately held software company providing software and services to a wide range of customers. SAS employs nearly 5,000 people in North Carolina, and I'm proud that this excellent company is represented on this panel today.

Ms. Mann has had a long and distinguished career advocating for change and innovation. She joined SAS in 1998 and in 2008 was promoted to her current role where she is responsible for developing and guiding the Human Resources Division at SAS, particularly by articulating the organization's strategy to attract, reward, and retain a top-notch workforce. Ranked on the Fortune 100 best companies to work for list since this list's inception, Ms. Mann leads a global workforce of over 12,000 employees with a myriad of talents and skills.

As I travel across North Carolina, no matter where I am, I hear the same refrain, and that is that we need more people with high-level skills in the science, technology, engineering, and math subjects. And it is companies like SAS that are looking to hire people with these skills. Without this trained workforce, our American companies will suffer.

Ms. Mann, I welcome you. I give you a warm welcome to our hearing today, and I look forward to hearing your thoughts.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much, Senator Hagan.

Our next witness will be Mr. Charles Kolb, president of the Committee for Economic Development, an organization dedicated to U.S. economic and social policy. Mr. Kolb has nearly 10 years of government service, holding senior level positions for the White House, Office of Management and Budget, and Department of Education. In addition, he practiced law at two Washington, DC law firms, Covington & Burling and Foreman & Dyess.

Our next witness is Dr. Eric Hanushek, currently the Paul and Jean Hanna senior fellow at the Hoover Institution at Stanford University. Dr. Hanushek is an accomplished researcher and leader in the development of the Economic Analysis of Educational Issues. His experience also includes government services as well as numerous academic appointments.

And our last witness is Dr. Richard Murnane, who currently serves as the Juliana W. and William Foss Thompson Professor of Education and Society at the Harvard University Graduate School of Education. Dr. Murnane is also a research associate at the National Bureau of Economic Research, and his research is focused on the intersection between education and the economy.

We thank all of you for being here today, and your testimonies will all be made a part of the record in their entirety. I'll ask you to sum up your testimony—in say 5 minutes. If you go over five,

that's fine. Don't worry about it. I don't think we've got so many people here we have to worry too much about—but if you go over eight or nine—once you get close to 10 minutes, then I'll get nervous. OK? But try to keep it less than 10 minutes, anyway. OK?

Ms. Mann, we'll start with you. Welcome.

STATEMENT OF JENNIFER MANN, VICE PRESIDENT, HUMAN RESOURCES, SAS INSTITUTE, CARY, NC

Ms. MANN. Thank you. Chairman Harkin, Ranking Member Enzi, members of the committee, thank you for the opportunity to participate in today's hearing. This is a very important topic and one that is very near and dear to us at SAS.

As Senator Hagan pointed out, SAS is headquartered in Cary, NC, and is the market leader in business analytic software and services and the largest privately held vender in the business analytic space. SAS has been in business for 36 years and employs more than 12,000 employees in 56 countries.

From a business perspective, SAS helps our customers in all industries solve critical business problems by integrating and analyzing data and sharing the insights gained from that analysis through various reporting capabilities. In short, SAS provides our customers with knowledge about their business by ensuring that every decisionmaker has the right information at the right time and in the right format.

For example, we help pharmaceutical companies use SAS to analyze clinical trials before FDA approval. Manufacturers use SAS to better understand product quality and their supply chain. And the world's largest banks use SAS to detect fraud and potential money laundering, and both State and Federal Governments use SAS to detect fraud, waste, and abuse of government programs.

In addition to being recognized as an industry leader, we are widely recognized as an employer of choice, having been recognized consistently high on Fortune's 100 best places to work list. This is important, because people want to come to work for SAS, and we want to retain the best and the brightest in the industry.

Given our business, the skills that we look for include statistics and advanced analytics, multiple programming languages, data modeling and data integration experience, and given the rapid developments in cloud and mobile computing applications, we're also looking for expertise in these areas as well. Typically, the level of expertise that we are seeking is at the post-graduate and Ph.D. level. Almost all of our employees have at least an undergraduate degree, with a large percentage of our staff having some type of advanced degree.

The pool of candidates meeting these requirements is small, and the competition for these candidates is fierce. Even with SAS's widely recognized culture and reputation, we can no longer rely on our brand alone to attract and recruit talent. In my opinion, the largest impediment that SAS faces in attracting qualified applicants relates to our educational system.

An ideal curriculum path for someone who wants to come to work for SAS would study science, math, engineering, and technology at the high school level. Once in college, these students would also study computer science and information management

and take more quantitative STEM courses or analytical or statistic courses. And at the graduate level, students would then pursue a master's or Ph.D. in STEM-related fields.

As I describe in greater detail in my written statement, it's fairly well established that our elementary and secondary school systems are not preparing or encouraging students to study STEM or computer science. And our post-secondary system is not effectively keeping those interested in STEM or computer science enrolled in these courses.

As the Change the Equation Coalition notes, a literate nation not only reads. It computes, investigates, and innovates. Therefore, we must have the educational infrastructure in place to ensure that we have students prepared with the right skill set and knowledge, including computer science.

SAS shares the belief that education is the economic driver for innovation, and, as a result, the commitment to education drives our company's policy, workforce, and philanthropic efforts. I've described in great detail in the written statement many efforts that we're undertaking to help ensure the workforce of today and tomorrow have the right skills. But let me highlight a few of those efforts.

From a policy perspective, SAS participates in the Computing in the Core Coalition, which exists to bring awareness to the lack of standards relating to computer science education, including a lack of professional development and teacher certification in this area; from a workforce perspective, developing innovative programs to start teaching children about careers in computer science at a younger age. These programs include training high school teachers to program in SAS software language and providing them with software and instructional materials for their classroom use free of charge.

We've also developed a program called Discover, Lead, and Solve that brings high school students already learning SAS programming to our SAS campus to interact with SAS professionals to help translate what they are learning in the classroom into real-world uses. And from a philanthropic standpoint, our community relations team launched a project called the Algebra Readiness Initiative, which was intended to increase the number of middle school students prepared to be successful in Algebra I, which is a gateway course for STEM and computer science.

The key was to use specialized SAS software to identify those students who were not enrolled in Algebra I but who had the potential to do well. The first year for this program was the 2010–11 school year, and SAS is pleased to say that during the first year of enrollment, enrollment in Algebra I increased by 38 percent across the districts and 96 percent scored at or above proficient.

We're also working with universities across the country to develop masters in analytics programs and certifications. But it will take some time before the supply of these students meets the demands.

From an overall business perspective, SAS is extremely encouraged by the Common Core State Standards. We believe that this effort is a major step forward in helping us ensure rigorous, con-

sistent educational standards across the United States that will help us catch up with our international counterparts.

In summary, even with SAS's reputation and culture, we are having difficulty finding technical talent needed to keep up with a growing market. This is not just a problem for SAS. It is a problem for all of us. As reported by the Bureau of Labor Statistics, more than 800,000 high-end computing jobs will be created by 2018, making this one of the fastest growing occupational areas. If we don't make change, we will not be ready.

I appreciate the opportunity to share the challenges and strategies that SAS is using to address this issue.

[The prepared statement of Ms. Mann follows:]

PREPARED STATEMENT OF JENNIFER MANN

SUMMARY

SAS is the world's largest privately held software company that provides software and services to a wide range of customers. We are best known for our analytical software, which enables our customers to use data to solve complex problems, often in real time. Leading analysts recognize SAS as the market leader in many of the industry segments in which we compete, based both on market share and quality of offering. As a company, we invest heavily in research and development, mostly here in the United States; on average we invest about 24 percent of revenues in R&D. This R&D investment is necessary to keep our products responsive to customer and market demands. We compete with other global companies in this space, both those headquartered domestically and internationally.

The key to SAS' sustained success has always been its people. Challenged to innovate, empowered to experiment and inspired to collaborate. From a hiring standpoint, SAS needs individuals that possess higher level math, statistics, and computer programming skills. We also need individuals with extensive domain expertise in specific industry segments, such as financial services, health care, and government. Finally, we need individuals who also possess "soft" skills, such as critical thinking and communication skills. These skills are important to SAS because a large percentage of SAS employees interact with customers, and thus must be able to communicate, collaborate, and comprehend. Given the skill set that SAS seeks, we look extensively to the graduate level and beyond. Ideally, our candidates have professional experience. These skills are highly desirable, particularly in companies that are not software developer, and, as a result, there is fierce competition for these candidates.

The remainder of the testimony discusses why there is so much competition for qualified individuals, challenges that we see in terms of preparing students to enter our workforce prepared, and what SAS, as a company, is trying to do to help resolve some of these challenges.

Chairman Harkin, Ranking Member Enzi, members of the committee, thank you for the opportunity to participate in today's hearing, "The Key to Global Competitiveness: A Quality Education." My name is Jenn Mann and I am the vice president of Human Resources for SAS. Headquartered in Cary, NC. SAS is the market leader in business analytics software and services, and the largest independent vendor in the business analytics space. Though we started with five employees 36 years ago, today SAS employs more than 12,000 individuals in 56 countries. About 5,000 of our employees live in North Carolina, another 1,000 around the United States, including large offices in Maryland, Connecticut, Colorado, Texas and Massachusetts, and smaller sales offices in a number of other States.

THE BUSINESS OF SAS

SAS is about helping our customers solve critical business problems by integrating and analyzing data, and sharing the insights gained from the analysis through various reporting capabilities. In short, SAS provides the Power to Know™ by ensuring that every decisionmaker has the right information, at the right time, in the right format. Let me give a couple of examples to more concretely demonstrate what SAS enables:

• pharmaceutical companies use SAS to analyze drug clinical trials before FDA approval;
• banks use SAS to analyze millions of transactions to detect potential money laundering and fraud;
• manufacturers use SAS to understand call center and warranty card information to detect both developing product issues, as well as problems in the supply chain;
• retailers use SAS to understand which products, in which sizes/colors/shapes need to be in which stores in what timeframes, as well as optimal pricing for each product;
• State governments use SAS to detect potential overpayments from government programs, manage criminal justice offender data, and analyze State pension risk; and
• the Federal Government uses SAS, not only to detect fraud, waste and abuse, but to improve the assessments and accuracy of critical homeland security programs such as E-Verify and cargo screening.

We are a unique company and quite proud of our history and results. Although we incorporated in 1976, the base software for SAS was developed while our founders were on staff at North Carolina State University. Today, SAS is recognized as a market leader in many of the industry segments in which we compete, based both on market share and quality of offering. We are gratified by the recognition given the level of competition in these markets from both domestic and international companies. One of the reasons that SAS leads is the amount of investment it makes in research and development. On average, SAS invests about 24 percent of its revenues annually in R&D activities.

The key to our success is our people. When the founders decided to separately incorporate, they had a distinct vision for creating an environment and set of work principles that would encourage innovation and creativity. From the outset, Jim Goodnight, SAS' founder and CEO, has believed that making employees a priority makes good business sense, and that it is his job, as CEO to ensure that each employee returns the next day. As we note in our 2009 corporate overview, "The philosophy that drives SAS is simple: Put employees and customers first and the benefits will follow . . .:" In short, SAS employees are challenged to innovate, empowered to experiment, and inspired to collaborate.

CORPORATE RECOGNITION

There have been many articles and reports that independently document the SAS culture, including a Stanford Business School study and a lengthy report several years ago on 60 Minutes. As the person responsible for Human Resources, the "evidence" that I am most proud of is the continuing recognition in the United States and abroad that SAS is "a great place to work," according to Fortune magazine. For 2012, SAS ranks No. 3 on the list; for the two previous years, we were *the* best place to work. I am not exaggerating when I say that this recognition, which is largely based on employee feedback, is critically important to our CEO and other senior executives.

This background is important because people want to come to work at SAS, and we want to recruit and retain the best and the brightest. And, because of our culture and employee commitment, we have an industry-low employee turnover rate (4 percent, versus 20 percent for our competitors.)

SAS HIRING NEEDS

Given our business, SAS recruits for specific skills. The skills that we are looking for today include:

• SAS certification or SAS programming skills (SAS itself is a computer language);
• Programming skills in Java, C, C++, Unix, and other languages;
• Database experience, including experience in SQL, Oracle and others;
• Adobe Flash/Adobe Flex, which are Web visual technologies; and
• HTML 5

Given rapid developments in cloud and mobile computing applications, we are also looking for expertise in:

• IOS development for mobile applications;
• Grid computing technology capabilities and expertise;
• Software as a Service capabilities and expertise;
• Network storage capabilities and expertise; and
• Data management/big data knowledge and expertise.

In addition to these specific skills, SAS also needs higher level expertise in several different areas. From an analytical perspective, SAS recruits talent with deep analytical expertise in the areas of statistics, operations research, and econometrics. Typically, the level of expertise that we are seeking is at the post-graduate level, particularly at the Ph.D. level. As important, we need individuals with substantive domain expertise in almost all industry areas, such as health care, financial services, energy, retail, manufacturing, and government (both State and Federal). Almost all of our employees have at least an undergraduate degree, with the overwhelming majority of staff having at least some type of advanced degree.

The pool of candidates that can meet these requirements is not large, and I will discuss some of the reasons for this and what SAS is doing to try to rectify this in a moment. I do want to mention, however, that as important as these qualities are, equally important to SAS is that our employees, even those working in our consulting and Research and Development functions, also need to have "softer" skills. These include:

- Relationship skills;
- Ability to critically think and solve problems;
- Collaborate; and
- Be self-directed learners.

The reason we seek these skills is twofold. One is that many of our employees are directly engaged with customers. They need to be able to communicate with these customers and to translate the information that they receive into actionable items. The second, related reason is that we want to become a trusted business partner for our customers. We want to be the first place our customers call when they have complex problems that they need to solve. Beyond having the relevant expertise in computer programming and analytics, our employees need to be able to build these kinds of collaborative relationships with our customers.

Another unusual feature of SAS is that we do not outsource functions. For example, we offer onsite child care and health care. The care providers, nurses, doctors, and staff are all SAS employees. We have several cafeterias in Cary—the employees of the cafeteria are SAS employees. We have landscaping requirements and the individuals that handle landscaping are SAS employees. I mention this because there are some opportunities at SAS that do not necessarily require post-secondary employment, but these positions are very few. In most instances, the people that we are looking for, even in these positions, have extensive experience.

RECRUITMENT STRATEGIES

Given the total package of skills that SAS seeks, our recruitment tends to focus on those already working professionally, supplemented with recruitment at the graduate and Ph.D. levels. The competition for these skills is extremely fierce. The ability to program SAS, by itself, is a very desirable skill that is sought in a variety of careers, including technology, manufacturing, finance and health care (particularly the pharmaceutical sector.) While people do want to work for SAS given our culture and commitment to employees, our brand alone is not enough to attract the types of talent that we need. We have, instead, begun to be more proactive about our recruitment practices, and have started using the power of networking and social media to help identify potential candidates before our need arises. We use a combination of social networking sites and Web searching to identify potential candidates. Once we have identified a pool of candidates, we can then tailor recruiting campaigns to educate individuals about SAS opportunities, and ultimately, to encourage to come to work for SAS. To illustrate, while historically much of SAS' recruiting has come from North Carolina State University, we decided recently to expand our search. We identified the top skills that we needed, and then matched these skills with the top 10 universities graduating students with these skills. Using a certain search methodology and key terms, we constructed a search and identified about 500 potential students. Once the list of candidates was identified, we could construct individualized recruitment campaigns, complete with links to job postings at SAS. This is a new strategy and we are encouraged by the early returns.

EDUCATIONAL PATHWAYS AND LONG-TERM HIRING CHALLENGES

An ideal curriculum pathway for someone wanting to come to SAS would look something like the following: children in high school pursue courses of study in science, technology, engineering and math (STEM). Once entering college, majors would include computer science or information systems; quantitative courses in STEM, or analytical/statistical courses. At the advanced degree level, fields of study could include advanced analytical degrees, Masters or Ph.D. degrees in STEM-related areas, statistics or applied math, or computer science.

As I stated, the pool of candidates for most of our positions is limited. Yet, as noted by the "Change the Equation (CTEq)" coalition (of which SAS is a member), "STEM is an economic imperative. Experts say that technological innovation accounted for almost half of U.S. economic growth over the past 50 years and almost all of the 30 fastest-growing occupations in the next decade will require at least some background in STEM." The Bureau of Labor Statistics estimates that by 2018, more than "800,000 high-end computing jobs will be created, making it one of the fastest growing occupational areas." (Source: Computing in the Core: Top 10 Facts About Computing Science.) As CTEq eloquently summarizes, "A literate nation not only reads. It computes, investigates and innovates." SAS could not agree more with this sentiment.

At the same time, we are not producing enough graduates in these areas. As further documented by CTEq:

- Only 45 percent of high school graduates in 2011 were ready for college work in math and 30 percent in science;
- In 2009, only 34 percent of 8th grade students were rated proficient or higher in a national math assessment and more than 1 in 4 scored below the basic level;
- According to 2009 test results of an international exam given to 15-year-olds, U.S. high school students ranked significantly behind 12 industrialized nations in science, and behind 17 in math.

According to the Higher Education Research Institute at UCLA, in 2009, 34.3 percent of White/Asian American freshmen students intended to pursue STEM studies and 34.1 percent of Underrepresented Minorities planned to pursue STEM studies. In looking at graduation rates for freshmen indicating an interest in STEM in 2004, the same study found that only 24.5 percent of White students *completed* STEM degrees within 4 years, and 32.4 percent of Asian American students finished within 4 years. Comparative statistics for Latino, Black and Native American students are 15.9 percent, 13.2 percent and 14.0 percent, respectively. The 5-year *completion* rates, respectively, for all groups are: 33 percent, 42 percent, 22.1 percent, 18.4 percent, and 18.8 percent. As alarming, the same study suggests that a large percentage of students in all demographic groups who initially express interest in pursuing STEM studies do not complete any degree, even within 5 years. (Source: "Degrees of Success: Bachelor's Degree Completion Rates Among Initial STEM Majors," Higher Education Research Institute at UCLA, January 2010.) The point is that the problem is not just preparing students at the K–12 level to study math and science; as a Nation, we also need to examine what is occurring at the collegiate level that discourages students from remaining in STEM disciplines.

An equally acute need, for SAS and for our Nation, is having students who are literate *computer programmers*, both in commercial grade software and in SAS. This may be our single greatest hiring need, and we are competing for this limited talent not just with other software companies, but with our customers, who need this talent as well. Unfortunately, there are real challenges to encouraging the study of computer science, separate and distinct from the challenges associated generally with STEM. The most critical includes the fact that most States do not have standards to encourage the study of computer science, and even fewer have programs to certify teacher competence in computer science. Too many people assume that understanding how to work a computer or mobile device is sufficient to serve as "computer science" education. To us, this is merely an example of technology literacy. In contrast,

> "computer science education means an academic discipline that encompasses the study of computers and algorithmic processes, including their principles, their hardware and software designs, their applications, and their impact on society."

(Source: Computing in the Core, "Computer Science in K–12 Education: Critical 21st Century Skills and Understanding/Understanding Computer Science Education, Information Technology and Technology Literacy").

EMBRACING EDUCATION IS BOTH AN ECONOMIC IMPERATIVE AND PHILANTHROPIC PASSION FOR SAS

SAS has been committed to helping improve education in our communities for many years. This commitment stems from the belief of our CEO that education is the driver of economic growth. Having a strong educational system is critical to our long-term success as a company. This belief not only permeates our culture, but is a driver for many of our workforce, policy, and philanthropic activities.

From a workforce perspective, SAS has developed outreach initiatives to try to reach high school students to educate them about potential technology career oppor-

tunities and to encourage them to consider SAS as a future employer. One is a formalized program that we, in Human Resources, have titled "Discover.Lead.Solve." Held in February 2012, SAS brought together five high schools (including 60 students) in North Carolina and Virginia. What these high schools had in common is that each is teaching SAS programming and each of the student participants is taking this programming course. The goal was to help translate what they are learning in the classroom to real world possibilities. In other words, how do the skills they are learning in the classroom translate into helping local law enforcement solve crimes, or enable health care providers deliver better patient care. A second important goal is to provide a career exploration platform for students to see what a 21st century business looks like. The program, which is free of charge to the participating schools, lasts for about the length of one school day. The presenters during the day are all SAS employees, holding a variety of positions within SAS. The interesting thing about these events is that they involve collaboration across SAS enterprises—Human Resources, SAS Education Practice (which is our business unit focused on the Education industry), and SAS Community Relations were involved in the planning and execution of the event, and individuals from a wide number of SAS business units and R&D were involved in the actual events. We expect Discover.Lead.Solve to be an annual event.

SAS has held similar kinds of programs in the past, and we continually get requests to host workshops for schools at all different levels. Given the number of requests, we utilize an approach to "act regionally while thinking globally" in deciding which requests to accommodate. One school request is worth mentioning, involving a program with an Algebra I class from a local high school, Warren New Tech High School in Warrenton, NC. We have had Warren come to SAS each of the last 2 years. For those on the committee not familiar with this high school, it serves a predominantly low-income student population, with roughly 70 percent of the student population on free or reduced school lunch. After coming to SAS and learning about computer science and careers in technology, here is the feedback that we received from the Algebra I teacher:

> "Half of my students did not pass Algebra I last year and are in my class. Students have vague aspirations to get into college or the military service. An overwhelming majority have not made the connections between their success now and future career opportunities. Many have not been exposed to what is out there. I would like for the visit to touch on some of these themes: hard work now equals future success and how important studying math is. My goal is for the visit to expose them to what is out there and encourage them to take their coursework even more seriously. . . . Many deep and sincere thanks for all your help and having an awesome site visit. My students walked away from the visit inspired and motivated to keep working hard. Already I am noticing some huge changes in my classroom. Students feel a sense of purpose that did not exist before. I credit the visit for making them realize what they were missing."

Another internally collaborative effort involves acquainting students with SAS Programming. For several years, SAS has provided SAS resources—including instructional materials and guides to university professors, free of charge, to help them incorporate SAS into classroom instruction. More recently, SAS has expanded this effort to the high school level in a program named "SAS Programming for High School." This program is a week-long program whereby we bring high school teachers from around the country to SAS for a 1-week training course on SAS programming. Once the course is completed, we provide teachers with the software and instructional materials they need to teach SAS programming back in their schools. All software and materials are provided at no cost to educators, and any travel fees incurred may be reimbursed through Perkins funds.

In a global economy, high school graduates with insufficient quantitative skills will be unprepared for college programs in technical majors required for STEM careers. As our own course progressions suggest, entry into these careers begins with proper preparation and subsequent access to advanced level courses. One of the critical gateways that facilitate this preparation in middle school is access to Algebra I.

In response to this gap, SAS Community Relations has launched the "Algebra Readiness Initiative (ARI)." The objective of the ARI was to increase the number of students prepared to be successful in Algebra I in middle school. The collaboration involved not just SAS, but the Triangle High Five Partnership consisting of five public school districts in the Triangle (Chapel Hill-Carrboro, Durham, Johnston, Orange and Wake County.) Planning for the ARI began in 2009. Superintendents from these school districts, using specialized SAS software to analyze district school data, identified that in most cases, less than 50 percent of 8th graders who were predicted

to be successful in Algebra I were actually not enrolled in the course. After initial meetings with superintendents and math curriculum directors, SAS hosted a number of meetings for principals, teachers, and guidance counselors to discuss ways in which the districts could collaborate to address this gap. Each district developed their own plan, based on these discussions, tailored to meet their unique populations and available resources. The result was that in the spring, 2010, all five districts modified their approaches to ensure that students capable of being successful were actually enrolled in Algebra I for the 2010–11 school year. As a result, 8th grade enrollment in Algebra I increased by an average of 38 percent across the districts, and 96 percent of the students scored at or above the proficient level. The initiative continues to focus on teacher training to ensure that educators are better prepared with deeper math content knowledge, especially throughout middle school grades. This strategy will help teachers in North Carolina use the lessons learned as they transition to teaching on the Common Core State Standards.

These examples suggest that building partnerships with the surrounding school infrastructure bears important rewards. The partnerships are not limited to K–12 institutions, but have to include institutions of higher education as well. In SAS' case, besides providing teaching and materials support, we have been actively engaged with North Carolina State University to develop a Masters of Analytics program. Essentially, the only way we are going to produce people with kinds of analytics expertise that we and other industries require is to help build the actual academic content for these programs. SAS is extremely encouraged by our efforts to create masters programs, with new ones at Texas A&M, Louisiana State University, and Northwestern launching this year. These are in addition to more than 40 certificate programs we support. Despite these efforts, the supply of analytics students still cannot keep pace with the demand for these skills.

From a policy perspective, I have already mentioned our involvement with CTEq, as well as our involvement with the Computing in the Core (CinC) coalition. We are hopeful that the message and efforts of the CinC coalition will lead to not just more emphasis on the distinct needs of computer science education, but will encourage States to think more critically about the curriculum requirements and professional certification that is needed for this course of study. It is an absolute imperative for our Nation.

I do want to spend a few minutes talking about the importance of the Common Core State Standards (CCSS) and what SAS believes it will accomplish. Under the CCSS initiative, math courses in North Carolina and 45 other States will, for the first time, be based on international benchmarks and comparable to other countries that outrank us on assessments, such as the Program for International Assessment (PISA). Beginning next year, math courses in North Carolina, Massachusetts, or any of the other participating States and District of Columbia will be comparable. SAS believes that the CCSS presents a chance to catch up with other countries that are out-performing the United States. This is a critical step in preparing our students for the global economy, and a step that the business community can and should fully support. However, for the CCSS to be successful, the standards must be implemented with consistency and fidelity. We must also provide training to prepare our teachers for this huge shift. While the States have signed on to a consistent set of standards, the timeframe for implementation varies widely. North Carolina, for example, has agreed to implement the standards by the start of the 2013 school year, with testing to begin at the end of the school year. This is an enormous step forward, and while we have concerns regarding whether North Carolina teachers (and teachers in other States) are prepared to teach to the more robust requirements, we will take this moment to celebrate and support progress.

There are any number of other SAS educational initiatives that I could mention, but I think I will conclude by highlighting just one. Through the efforts of SAS' Community Relations team, we were a founding partner of the North Carolina 1:1 Learning Collaborative. According to the Southern Region Education Board, nearly 3,000 students in the region drop out of high school every school day. Nationally, the studies suggest that 1 in 4 students leave school without graduating annually. While the reasons for the high drop-out rate are complicated, we believe that one factor may be boredom, and the limited use of technology in the classroom. Other studies have validated that the use of technology—including the use of computers and/or laptops and access to the Internet—may be key to encouraging middle school students to pursue STEM education. (Source, Lenovo 2011 Global Student Science and Technology Outlook). The North Carolina 1:1 Learning Collaborative attempted to address these issues by providing laptops, professional development and critical support to schools and rural districts in North Carolina. In short, it was a pilot effort to help participating high schools in North Carolina take a strategic approach to creating future-ready schools. The effort was evaluated by the Friday Institute

at NC State, and has culminated in Redesign 2.0, and a framework for how to implement and replicate in other schools and communities. A growing number of schools are using this framework to launch their own 1:1 Learning Initiatives. We believe that students who graduate from these schools will be prepared to work and prosper in our global economy.

CONCLUSION

Even with the culture, commitment and resources of SAS, we are having a difficult time finding the talent that combines the right technical skills with necessary "soft" skills. We are competing for these exceptional talents with many other companies, which has forced us to become proactive relationship-builders to successfully recruit the talent we need. Education at all levels is the key to our future, as a company and as a Nation. Although much work remains to put the United States back into a competitive position with the educational systems and standards of other nations, SAS believes that there is important work that has been done. Because of our commitment, we are trying to do our part, and appreciate this opportunity to share our story. Thank you and I am happy to answer any questions you might have.

The CHAIRMAN. Thank you very much, Ms. Mann.

And now we'll turn to Mr. Kolb.

Welcome and please proceed.

STATEMENT OF CHARLES KOLB, M.A., J.D., PRESIDENT OF THE COMMITTEE FOR ECONOMIC DEVELOPMENT (CED), WASHINGTON, DC

Mr. KOLB. Thank you very much. Mr. Chairman, Senator Enzi, Senators Bingaman and Hagan, thank you very much for inviting me to speak on behalf of the Committee for Economic Development.

CED was founded in 1942, so this is our 70th anniversary. And as some of you may know, one of our early signature projects led to the development of the Marshall Plan to rebuild Western Europe after World War II. Since then, we've been active with our 200 business leaders on the board focusing on issues such as campaign finance reform, healthcare, deficit reduction, the structure of the Federal debt, globalization and trade, corporate governance, and, of course, education.

Mr. Chairman, I think I'm correct in saying this is the first time in CED's 70 years of history where we are actively engaged in all aspects of education reform—early childhood education, K–12, and post-secondary education—where we will have a report released later in April.

I want to point out at the beginning that next year is the 30th anniversary of A Nation at Risk. And that report launched a wave of accountability, a focus on standards assessment, measurement, and testing, which I think, on balance, has been pretty good for the country. You've seen it on a bipartisan basis. Presidents Bush and Clinton embraced National Education Goals. President George W. Bush had No Child Left Behind, and President Obama has Race to the Top. I think it's fair to say that over 30 years, you've had a focus on K–12 reform, which has been good, not finished, but good.

Meanwhile, during that 30-year period—this may be controversial, but I'm going to say that post-secondary education pretty much got a pass. A lot of the focus when I was here testifying before was on important issues like access and financing. But only recently, within the last few years, have people begun to ask questions about access to what? What is the quality of our post-secondary education? What should our young people know and be able

to do as a result of their experience either with a 2-year, 4-year, or a proprietary school?

And my thesis for you this morning is that there are three factors that are driving this new wave of accountability for post-secondary education. And I sum them up as cost, competition, and technology.

The cost should be pretty obvious. It was George Washington University in the city that was the first institution to charge $50,000 to go to college. That's the full sticker price. And this year, we've seen that Sarah Lawrence College is close to $60,000. Now, that's a lot of money for most people. And if you're buying a luxury automobile at $60,000, particularly if you have to buy four of them in a row or five or six, depending on how long it takes you to graduate, you're going to ask a lot of questions about what kind of car you're getting for that $60,000.

I think this is a good part of the accountability movement. So cost is driving questions that weren't asked before.

Second, competition. I would refer you to one book which I found really fascinating. It's by the scholar, Ben Wildavsky, at the Kauffman Foundation in Kansas City. It's called The Great Brain Race. And Ben Wildavsky makes the point that the competition we face in education is for supply—it's on the supply side, it's on the demand side, it's competition for students, it's competition for faculty, and it's global.

You see things happening in the Middle East, in Asia, in India, where those countries are making major investments to create first-class, world-class institutions intended to rival our own. So we can't simply rest on our laurels and congratulate ourselves on having the best institutions. We've got real competition.

And then, finally, the point about technology, I think, is really interesting, and I think it's a point that makes it clear that the current business model of many of our 2-year and 4-year institutions is broken. Now, I don't want to imply that technology is a magic bullet. I'm not talking about turning everything into online courses.

But if you look at what's happening at places like MIT or Western Governors University, you see a different approach to delivering post-secondary education. And I would point out to you two really fascinating articles that were in Monday's *New York Times* about massive open online courses.

Dr. Hanushek, one or two of the examples came from Stanford, where you had two professors who had an online course called Building a Search Engine, which had 90,000 students. You had another Stanford professor who had an artificial intelligence course that attracted 160,000 students in 90 countries and was translated into 44 languages versus 200 students on campus at Stanford and 30 people who took the final exam. I would submit to you that technology by itself is going to up-end the existing business model and change the focus on bricks and mortar into something totally different that we can't necessarily identify even now.

The Committee for Economic Development will have a report on some ideas around postsecondary-education reform that will come out late next month. And we're going to look at issues such as transparency, efficiency, productivity, and innovation throughout

the sector. These are words that typically don't come up in the post-secondary sector. They're more in the corporate sector.

But we think that this is a very positive time for American post-secondary education. And CED, I hope, Mr. Chairman, can do in post-secondary education what I think you know we've tried to do in earlier reports on early childhood education and K–12.

Thank you very much.

[The prepared statement of Mr. Kolb follows:]

PREPARED STATEMENT OF CHARLES KOLB, M.A., J.D.

SUMMARY

The Committee for Economic Development is a nonpartisan, business-led public policy organization based in Washington, DC. We have close to 200 senior business leaders and university presidents on our Board of Trustees, and our current co-chairs are Roger W. Ferguson, Jr., the CEO of TIAA–CREF, and Donald Peterson, the former CEO of Avaya.

Until fairly recently, America's postsecondary-education sector has managed to avoid the types of accountability questions that have characterized K–12 education policy discussions. For much of the last 30 years, post-secondary education's public policy debates have primarily concerned important questions relating to access and financing but relatively few questions about "access to what?"—about the quality of that American postsecondary-education experience and what our young people should know and be able to do as a result of their experience.

In the last few years, however, that benign neglect has started to change. Today there are three factors that are driving this change and resulting in more questions being asked about American post-secondary education. These factors are cost, competition, and technology.

These accountability questions are at the heart of rising competition—competition that wasn't there 20 or 30 years ago. Moreover, that competition is for both supply and demand; it is also global in its nature. Read the excellent study entitled "The Great Brain Race," by Ben Wildavsky, and you will appreciate that universities around the world are competing for both talented students and faculty. Countries such as China, India and the United Arab Emirates are making substantial public investments in post-secondary education—in some cases trying to emulate the best American research institutions through billions of dollars worth of infrastructure and human capital investments.

We are also seeing an increased focus on promoting greater transparency, efficiency, productivity, and innovation throughout America's post-secondary sector. The change is being ably assisted by reports such as McKinsey & Company's 2011 study, "An economy that works: Job creation and America's future." Likewise, the champion of the concept of "disruptive innovation," Harvard University professor Clayton Christensen has partnered with Innosight to write a must-read study, "Disrupting College: How Disruptive Innovation Can Deliver Quality and Affordability to Post-Secondary Education," that details the ways in which "disruptive innovation" is changing American education.

And it is vitally important that business play a role in shaping post-secondary education policy. There's the obvious reason of self-interest: most CEOs with whom I speak are concerned about the future skills of the American workforce. These business leaders are also on the frontline when it comes to appreciating the skills that are needed in the workforce. And I would add that business leaders can be powerful change agents because they have all faced similar challenges and competition over the last 20 years in their own activities. They understand change, have had to embrace—not fear—it, and can help make change happen.

On behalf of the Trustees and staff of the Committee for Economic Development, I thank you for the opportunity to share these thoughts with you at today's hearing. CED looks forward to working with leaders in Congress, as well as in our States and local communities, to ensure that America offers the finest, most efficient, most productive, and most affordable range of quality post-secondary education opportunities in the world.

Chairman Harkin, Senator Enzi and members of the committee, thank you for the opportunity to speak with you today. The Committee for Economic Development is a nonpartisan, business-led public policy organization based in Washington, DC. We

have close to 200 senior business leaders and university presidents on our Board of Trustees, and our current co-chairs are Roger W. Ferguson, Jr., the CEO of TIAA–CREF and the former vice-chairman of the Federal Reserve Board, and Donald Peterson, the former CEO of Avaya.

CED Trustees decide the policy issues we will address, participate in subcommittees to determine our findings and recommendations, and, increasingly, engage around the country to promote CED's recommendations. We typically do not lobby, and the Trustees who participate in our organization are deeply committed to finding strategies that will promote greater economic growth and opportunity for all Americans.

This year marks CED's 70th anniversary. Our early work in the 1940s led to the creation of the Marshall Plan which helped rebuild Western Europe after World War II. In recent years we have presented a business voice urging important reforms in areas such as fiscal and tax policy, health care, campaign finance, corporate governance, international trade and globalization. Throughout much of CED's history, one policy area, in particular, has been a major interest for our Trustees: education.

As business leaders, CED Trustees understand that how we invest in human capital will determine how productive and competitive we are in the global economy. These human capital investments will also determine how equipped our citizens will be to meet their responsibilities as citizens of a vibrant democracy.

It is because of these concerns that the Committee for Economic Development has become a leading business organization that focuses on the importance of education across the education continuum: the early years, kindergarten through 12th grade, and, more recently, post-secondary education. In fact, for the last decade, CED has become known around the country for its work in early childhood education. Our work with Professor James Heckman, a Nobel laureate in economics at the University of Chicago, has focused on efforts to quantify the returns on front-end investments in quality pre-K education.

This effort to consider education spending from an investment perspective that asks tough accountability-oriented questions about the returns on these investments has had a major impact on early education spending around the country in both the public and private sectors. We can point to efforts like North Carolina's "Smart Start" program and PNC Bank's renewed $250 million support for its "Grow Up Great" initiative in communities across the Nation as successful examples of solid support for early childhood programs.

A serious and sustained accountability movement began for K–12 education nearly 30 years ago with the publication of the widely read report on "A Nation at Risk." That celebrated report led to efforts such as the National Education Goals of Presidents George H.W. Bush and Bill Clinton, President George W. Bush's "No Child Left Behind Act," and President Barack Obama's "Race to the Top" challenge.

Until fairly recently, however, America's post-secondary education sector has managed to avoid the types of accountability questions that have characterized K–12 education policy discussions. For much of the last 30 years, post-secondary education's public policy debates have primarily concerned important questions relating to access and financing but relatively few questions about "access to what?"—about the quality of that American postsecondary-education experience and what our young people should know and be able to do as a result of their post-secondary-education experience.

In the last few years, however, that benign neglect has started to change. Today there are three factors that are driving this change and resulting in more questions being asked about American post-secondary education. These factors are cost, competition, and technology.

Let's take cost first. From 1990 to 2009, college tuition and fees increased 274.7 percent—much more than health care costs and the consumer price index. George Washington University became the first university in the country at which total costs reached $50,000, and recently Sarah Lawrence College announced a sticker price of over $59,000 for a student to attend that institution. Most people purchasing a luxury automobile at that price (especially if they had to buy a new one each year for 4 years) would ask a lot of questions about how much car they were getting for that amount.

Now, I realize that because of grants, loans, endowment support, and other sources of funding, that cost figure may be different from what a typical student and his or her family pays, but the fact remains that inflation in post-secondary education is unsustainable, may be driving many young people to rethink the value of post-secondary education in terms of making an investment in their future careers, and has resulted in a debt load which has reached approximately $1 trillion in student loan debt (exceeding credit card debt for the first time) and saddled our

young people with financial obligations that often circumscribe their future career choices. For many indebted students, it is like having a mortgage but not having the house. Their hope is that the education and skills they have gained will enable them to become gainfully employed.

At the same time, one solid benefit of these unsustainable price increases has been to drive accountability questions similar to the ones that Rick Hanushek and others have asked about our K–12 education system: when we are outspending the rest of the world on our post-secondary system, why aren't the results better? Why do so many young people who start a college degree drop out? Why are our completion and attainment rates not any better? Why are so many resources being wasted in this sector? Does this experience lower the motivation for young people at a time when they need to be getting as much education as they possibly can?

By the way, we see a similar challenge in America's health care sector. Why is it that a country such as France spends about half as much on health care as we do but experiences far better outcomes when it comes to longevity, infant mortality, and obesity prevention?

These accountability questions are at the heart of rising competition—competition that wasn't there 20 or 30 years ago. Moreover, that competition is for both supply and demand; it is also global in its nature. Read the excellent study entitled "The Great Brain Race," by Ben Wildavsky, a fellow at the Kauffman Foundation in Kansas City, and you will appreciate that universities around the world are competing for both talented students and faculty. Countries such as China, India and the United Arab Emirates are making substantial public investments in post-secondary education—in some cases trying to emulate the best American research institutions through billions of dollars worth of infrastructure and human capital investments. Europe's Bologna Project is but one example of a continent-wide effort to harmonize degrees among many universities in a way that enables students to study in different schools in different countries and get a degree that reflects common standards of content and quality. Contrast that effort with the immense difficulty we now have in the United States of harmonizing credits and degrees between and among 2-year community colleges and 4-year institutions.

And finally, there can be little doubt that the information technology revolution of the last several years will have a major impact on both the cost of delivering post-secondary education and the manner in which such education is transmitted. In 2009, the Committee for Economic Development's Digital Connections Council, under the leadership of former IBM research chief Paul Horn, released an important report on the way in which the IT revolution was impacting American post-secondary education. Paul Horn, Chair of CED's Digital Connections Council stated that,

> "While other industries, such as finance and entertainment, have used openness to improve their business model, higher education has been slow to adapt to the digital information age. Creating, analyzing, and transmitting information is vital to teaching and learning, so it is a matter of concern that colleges and universities are lagging in utilizing technology to achieve greater openness to their core missions of teaching, learning and research."

Today we can see precisely how such efforts are playing out, whether it is through online courses at various proprietary schools, MIT's open courseware initiative, or the success to date of Western Governors University's approach to online learning in certain disciplines where students can earn both baccalaureate and advanced decrees at a significantly reduced cost.

We are also seeing an increased focus on promoting greater transparency, efficiency, productivity, and innovation throughout America's post-secondary sector. These four words are not terms that have traditionally been associated with post-secondary educators and administrators—but that situation is rapidly changing. The change is being ably assisted by reports such as McKinsey & Company's 2011 study, "An economy that works: Job creation and America's future." Likewise, the champion of the concept of "disruptive innovation," Harvard University professor Clayton Christensen has partnered with Innosight to write a must-read study, "Disrupting College: How Disruptive Innovation Can Deliver Quality and Affordability to Post-Secondary Education," that details the ways in which "disruptive innovation" is changing American education. This study also discusses how such innovations can be brought to scale in the near future.

In 2011, with funding from the Bill & Melinda Gates Foundation, the Committee for Economic Development launched a trustee-led subcommittee to focus on ways in which greater innovation, productivity, and efficiency could drive needed reforms across the post-secondary sector. This CED subcommittee is co-chaired by Manpower Group Chairman & CEO Jeff Joerres and Bruce MacLaury, president emer-

itus of the Brookings Institution. Another key member of this working group is Kelly Services president and CEO Carl Camden.

Both Jeff Joerres and Carl Camden lead global companies that offer what might be called a microeconomic window on workforce trends in this country and abroad. Their companies are effectively "canaries in the coal mine," because they often detect what is happening in labor markets here and around the world before government institutions and the media see these trends. Moreover, their business involves, among other things, filling positions that range from entry-level jobs to more technical positions requiring advanced doctoral degrees in engineering and the sciences. So they are in a unique position to see the skills being demanded by employers around the world and the skills being offered by workers in the countries in which their companies do business.

Both of these CEOs will tell you that for America to be competitive at home and around the world, we need more people with more education. A high school degree is no longer enough and will be, in many instances, insufficient to qualify for many of today's jobs that will compensate workers at middle class income levels and above. We also need more young people in America who pursue international studies and who demonstrate proficiency in foreign languages.

Achieving the 21st century version of the American Dream will require a much more educated citizenry and workforce. We are now a knowledge-based and skills-oriented economy, and our education investments need to be focused laser-like on programs, strategies, and partnerships that can address this constantly changing national and international dynamic. Our workers face a competitive environment in which their skills must be constantly evolving and increasing if we are to have a dynamic and efficient workforce.

The CED report, which we hope to release in New York City in late April, will highlight many of these trends and challenges. We will approach these issues from the perspective of looking at what we call broad-access institutions, the 2-year, 4-year, and proprietary institutions that will provide the facilities and courses that will serve most Americans seeking post-secondary education. We explicitly are not addressing the elite, research colleges and universities; they are important and are often referred to by many as our flagship post-secondary institutions, but because they serve a much smaller population, they are not the institutions that will provide most of the opportunities that our future workforce needs.

The CED report will address issues that relate to State-level policies, in particular, State-level financing issues for the broad-access institutions. We hope to inform and mobilize business leaders across the country to become champions of post-secondary education reform in ways that will enable State officials to set outcome-related goals, develop strategic financial plans, adopt meaningful metrics and other approaches that will enhance educational outcomes for these institutions.

Now, I know that I'm being somewhat vague—intentionally so—because the final CED report is not yet ready for release. But I do pledge to this committee that you and your congressional colleagues will receive CED's report next month, and I know that our business and university trustees will welcome your involvement as we try to engage business leaders in this effort in your States and around the Nation.

And it is vitally important that business play a role in shaping post-secondary education policy. There's the obvious reason of self-interest: most CEOs with whom I speak are concerned about the future skills of the American workforce. These business leaders are also on the frontline when it comes to appreciating the skills that are needed in the workforce. And I would add that business leaders can be powerful change agents because they have all faced similar challenges and competition over the last 20 years in their own activities. They understand change, have had to embrace—not fear—it, and can help make change happen.

It is, in my view, a very positive sign, that within the last 3 years, there has been a growing interest in the way in which American post-secondary education—its opportunities and its challenges—will shape the future of our economy and our democracy. There has been an increasing number of studies and books on the topic by people such as Richard Arum; Derek Bok; Andrew Hacker & Claudia Dreifus; Pat Callan; William Zumeta; Joni Finney; Andy Rosen; Clayton Christensen; David Breneman; and, Ben Wildavsky. This development is a good sign, in my view.

The Obama administration and major foundations such as the Bill & Melinda Gates Foundation and the Lumina Foundation have announced important attainment goals that are designed to make America first in the world in terms of the percentage of our population that have quality post-secondary credentials. We clearly as a nation need to increase dramatically both the completion level and the educational attainment level of our people.

But what we've seen from time to time in our K–12 sector is that goals can be missed altogether or gamed along the way. We cannot afford to experience either

of those outcomes anymore. As we strive to meet these important completion goals, we should also make sure that we have a national discussion—local, State, and Federal—about what it is our post-secondary students should know and be able to do. Clearly the answer to that question in 2012 has to be fundamentally different from what it was even 10 years ago.

On behalf of the trustees and staff of the Committee for Economic Development, I thank you for the opportunity to share these thoughts with you at today's hearing. CED looks forward to working with leaders in Congress, as well as in our States and local communities, to ensure that America offers the finest, most efficient, most productive, and most affordable range of quality post-secondary education opportunities in the world.

The CHAIRMAN. Thank you very much, Mr. Kolb.

And now we'll turn to Dr. Hanushek.

Dr. Hanushek, please proceed.

STATEMENT OF ERIC A. HANUSHEK, Ph.D., PAUL AND JEAN HANNA SENIOR FELLOW, HOOVER INSTITUTION, STANFORD UNIVERSITY, STANFORD, CA

Mr. HANUSHEK. Thank you, Mr. Chairman, and thank you and Senator Enzi and Senator Bingaman and your committee for taking leadership on this issue.

I will state at the beginning and repeat it a couple of times that I think this is the most important issue facing the Nation today. Our schools, as you mentioned in your introduction, are not competitive internationally. They're mediocre. They're not the worst, but they're far, far from the best. And this has huge implications for the future of our children and our Nation.

The potential difference in our children's future is really profound. On the current path with middling schools, we are going to be on a low-growth path in the future. And what that's going to imply, among other things, is a continuing struggle about the distribution of income, about how we use our public resources and fiscal deficits.

The alternative is choosing a different path that has better education for our children. And what this implies is a higher growth rate, which means that we can solve many of these distributional problems and fiscal problems not by getting the right balance between revenues and spending, but by increasing the size of the pie. And these are huge differences. What determines which path we're on is the skills of the American worker, and the skills of the American worker are determined by the quality of our schools.

What I want to do is fill in a few of the differences of these paths and talk about where we can go, briefly. Washington, as I see it from California, is fixated on the short run of how to deal with the ramifications of the 2008 recession. But the magnitude of the differences between the cost of the recession and not going into improving our long-run growth are just astounding.

The most important determinant of the U.S. economy, as I say, is the skills of the workers in the economy. And when we look around the world and look at growth rates, which—growth rates determine our future well-being, as you know. I have a graph at the end of my written testimony that plots out growth rates of GDP per capita between 1960 and 2000 for countries of the world. And it plots them out against skills and achievement on math tests as seen by the PISA test or other international test.

What you see is that it's virtually a straight line. Countries that have improved the skills of their workers grow faster. Now, the implications of this are easy to see if we just assume that the future is going to look like the past in terms of the growth and the impact on growth.

Take an example where we could move the achievement of our students up to the level of, say, Germany or Australia. Now, in terms that you know, I'm sure, this is about 25 points on the PISA test, on math tests. So if we take this picture and project out into the future what that means for the U.S. GDP and look at the increase in GDP for somebody born today, who would be expected to live for 80 years, remembering that things in the future are worth less than those in the present, discount it at 3 percent, and we get the present value of that difference—$44 trillion for being in Germany and Australia.

Now, nobody, at least outside of Washington, understands what $44 trillion means. But we have a GDP that's less than $16 trillion today. The total cost of the 2008 recession to date is estimated at around $3 trillion.

Take something closer to home than Germany and Australia. Take Canada, which looks kind of like the United States in many ways. If we could get the achievement of our students up to Canada, the present value of the increased GDP is on the order of $75 trillion to $80 trillion. Now, in my estimation, this is something that warrants really substantial changes. We should take seriously what we can do.

A couple of things I should say—one is this is not a situation of a few bad States dragging us down. I have another plot in the back of my written testimony where you can look up your own State. But you'll see that our best State, Massachusetts, ranks behind 16 other countries in terms of math performance.

It is also not a case that it's just that we have a particularly difficult-to-educate population. We do. We have a heterogeneous population, and we don't want to minimize that. But if you take college-educated students from Massachusetts, sort of the best students from the best State, they will still rank behind seven countries. Our best students will still rank behind the average student in seven other countries.

This is something that we have to take seriously, in my mind. Now, there are different views on how we can go about doing that. There are a couple of things I should say quickly. One is this is not a matter of just getting more kids to graduate from high school or to go to college if they aren't learning anything. If students go to school and don't learn anything, as measured by achievement, it doesn't count, and that's the simple facts. So if they get into college by lowering the admission standards, and they don't learn anything, we're not going to gain from that.

There are many potential solutions to this problem. The one that I have advocated that some of you may know is improving the quality of teachers in the United States. I think that that's an extraordinarily important issue. There are, of course, many different proposals of how to go about improving the quality of our teachers, and I can go into that later. But I think that we have to be doing something there.

The summary is—and I'll stop now and we can talk later—is that this is such an important issue to our Nation and our future. It determines what our country will look like, whether we are an economic leader or not. And if we just do minor marginal things, like slightly smaller class sizes or, in my opinion, just going after great battles to the common core, we're not going to solve this problem. We're not going to lead to the kinds of differences that are important to our children.

[The prepared statement of Mr. Hanushek follows:]

PREPARED STATEMENT OF ERIC A. HANUSHEK, PH.D.

SUMMARY

While current policy discussions stress the short run economic and fiscal situation, the well-being of our society is much more dependent on long run growth. The international record of the last half century shows clearly that the skills of the labor force directly drive the rate of growth of economies. And, on this score, the United States is not well-positioned. Our schools are producing mediocre outcomes by international standards, and this dramatically constrains our future.

If our schools could raise the performance of our students to the level of Germany or Australia, history suggests that our economy would grow faster—producing an addition to GDP of some $44 trillion in present value terms. If we could equal the results of Canadian schools, it would be worth $75–$80 trillion. (For comparison, the loss from the current recession is estimated at around $3 trillion). Such improvements of our schools would more than solve our fiscal problems and would dramatically change the economic well-being of our children.

The problems of performance are the result neither of a few poorly performing States nor of a difficult to educate population. The most advantaged students from the best State still do not compete well with average students from a number of other nations.

The issue is quality of skills and will not be solved by extending the time of students in school unless they are learning a lot during that time. That is the challenge and, if ignored, places our national future on a very much lower path.

By world standards, our current education system is mediocre—not the worst but by far not the best. We should not allow this to continue. By choosing different education policies, we can substantially improve the lives of our children and the future place of our Nation in the world economy.

The potential difference for our children's future is not trivial, but profound. On our current path, we continue with our middling schools and moderate real income growth, which in turn yield increasing struggles and discord over the income distribution and how to spend our limited public budgets. But we could choose a different path, one with better-educated children, international economic leadership, and a faster growing economy. With this, we solve our fiscal and distributional problems not with battles over the balance of revenues and spending but by ensuring that the pie grows.

Which path we are on is determined by the skills of American society, and the skills are determined by the quality of our schools.

Let me fill in these paths, because in my opinion there is no more serious challenge facing our country. Nearly all of today's policy debates focus narrowly on pulling out of the current downturn in the economy. But, frankly, the importance of dealing with this—and I realize its importance to many families today—is simply dwarfed by the long run growth of the economy. This focus on today may serve short-term political interests during this election year, but it neglects our children and their future.

The most important determinant of the future well-being of the U.S. economy is the rate of economic growth. It is economic growth that has put us in our current position of leadership. And it is economic growth that will determine the fate of the next generations.

The most important driver of economic growth is the skill of the labor force, what economists call human capital. This fact comes through clearly when we look at differences over the past half century in long run growth rates for countries around the world. Countries that have developed more skills in their population systematically have grown faster.

This can be seen from comparing growth to skills across countries (Figure 1). If we array growth rates in GDP per capita from 1960–2000 against international assessments of math achievement, we see that countries fall almost on a straight line. (The only other factor considered here is the starting point of each country, GDP per capita in 1960).

This figure lays out our choices. Current U.S. students—the future labor force—are not competitive with students across the developed countries of the world. If we continue at this level of performance, we are surely on the low-growth future path—the complacent continuation of current policy that leaves us with a variety of increasingly difficult policy dilemmas.

The different options (and results) can be laid out in a straightforward way. To see the implications of skills for the economy, let us assume that the future looks like the historical pattern. We can then project growth into the future under two alternatives: (1) our current level of achievement, and (2) what would be expected with improvement of our schools.

Consider a school improvement program that brought us up to the level of Germany or Australia in math performance (approximately 25 points on the PISA tests) over the next 20 years. By historic outcomes, when these higher skilled students enter the labor force, they will produce an economy that grows faster. The results are stunning. If we discount the future at 3 percent per year to recognize that future gains are not as valuable as current gains, the improvement over the lifetime of somebody born today would have a present value of **$44 trillion**. Numbers like this have little meaning to most people, but we can think of some direct comparisons. Today's economy has a total GDP of less than $16 trillion. The cost of the 2008 recession to date is perhaps $3 trillion. The projected fiscal deficits that have caused such policy anguish are far below what we are losing by not undertaking such an improvement in our schools.

Here's a comparison even closer to home. What would we project for the economy of bringing skills up to the level of Canada? A present value of **$75–$80 trillion**.

The potential differences in the future of the United States economy are dramatic. These gains are equivalent to a level of GDP that on average is 6–10 percent higher *every year* for the next 80 years. It does not take a new CBO projection to realize that this eliminates the currently projected fiscal imbalances and leaves plenty to spare.

While the gains from growth don't accrue for some time into the future—until the kids are out of school and in the labor force—neither do the fiscal problems facing the Nation. The pattern of increasing Medicare costs match up quite nicely with the improvements to the economy from increased productivity growth.

In the past we have had a dominant position in world growth despite the shortcomings of our schools by having other advantages: free movement of labor and capital, strong property rights, a limited government intrusion; an historic superiority in the level of school attainment; strong colleges and universities; and an ability to adopt skills produced elsewhere through immigration policies that allow skilled workers to enter. But, without belaboring it, each of these advantages has eroded considerably and probably should not be counted on in the future to carry our economy.

It is also true that this is not a problem of a few States doing badly. If we compare the performance of individual States to nations around the world (Figure 2), we see that students in our best State (Massachusetts) in 2006 were not competitive with the average student in some 16 countries. My own State of California is competing with Portugal and Greece.

Nor is it just a problem of having a particularly difficult-to-educate population. The children of college-educated parents in Massachusetts would still trail the average student in seven countries.

My message is simple. The gains from improving our schools—or the costs of not doing so—are enormous. They are large enough that we should be willing to consider major alterations in policies. We know that changing things around the margin—like moving to even smaller class sizes or adding some more master's degrees for our teachers or introducing the common core curriculum—have little hope of redressing the problems.

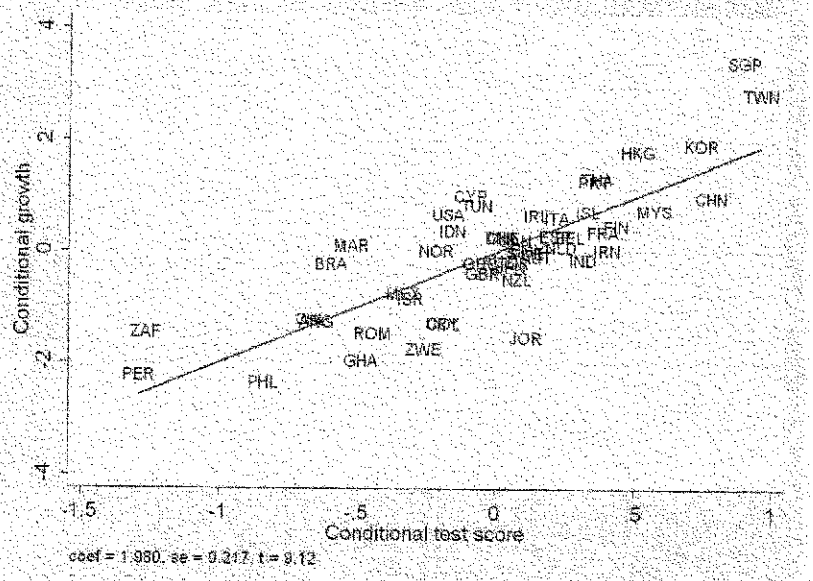
It is important to stress that it is not just years in school, but what people know that counts. In terms of the differences in growth across countries, it is performance on international assessments that indicates the skill levels. It is not the years of schooling per se. If students spend more years in school but do not learn much, the gains are nil. The implication of this for our policies is that just trying to keep students in school—to graduate from high school or to college—works only if the students are learning something. And, if they come up to the last years of high school

with poor basic skills from earlier schooling, they probably do not learn a lot at the end.

There are different views about the most effective policies for increasing skills. I am happy to provide my thoughts. As many of you might know, I believe that it is essential that we improve the quality of our teachers, although there are different ways to get to better teachers.

I will stop here by underscoring the basic issue. We need to improve the skills of our population if we hope to continue as the world's economic model. We have the resources to prepare our children for an outstanding future. It is only the will on our part to help them that can hold them back.

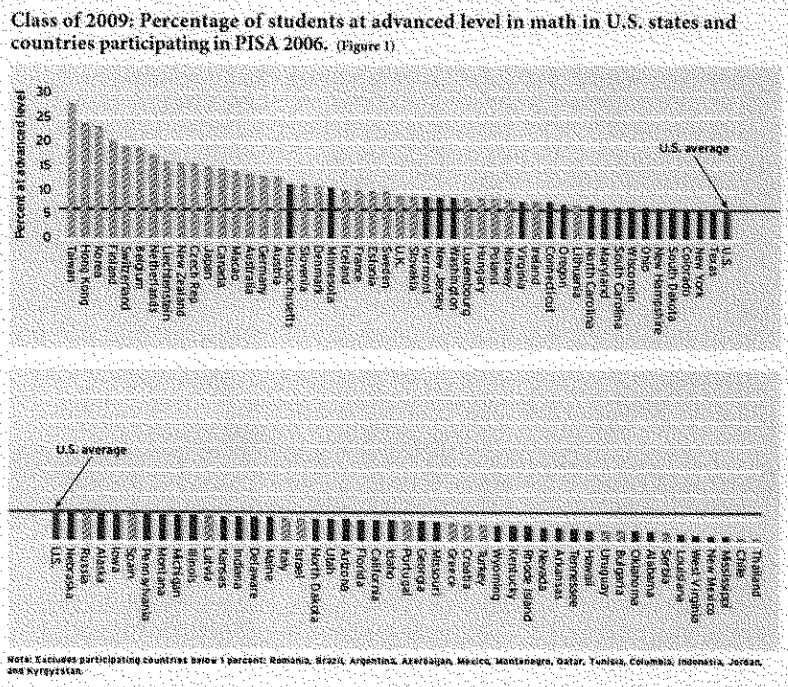
Figure 1. Growth rates of GDP per capital between 1960-2000 compared to mathematics achievement



Note: Figure is based on a regression equation that includes GDP per capita in 1960 and average years of school completed for 50 countries with complete data.

Source: Hanushek, Eric A., and Ludger Woessmann. 2008. "The role of cognitive skills in economic development." *Journal of Economic Literature* 46, no. 3 (September): 607-668.

Figure 2. Percent of students performing at or above the advanced level of NAEP in mathematics



Source: Hanushek, Eric A., Paul E. Peterson, and Ludger Woessmann. 2011. "Teaching math to the talented." *Education Next* 11, no. 1 (Winter): 10-18.

Appendix A. Hanushek, Eric A., Dean T. Jamison, Eliot A. Jamison, and Ludger Woessmann. 2008. "Education and economic growth: It's not just going to school but learning that matters." *Education Next* 8, no. 2 (Spring): 62–70 may be found at *http://educationnext.org/education-and-economic-growth/*.

Appendix B. Peterson, Paul E., Ludger Woessmann, Eric A. Hanushek, and Carlos X. Lastra-Anadón. 2011. "Are U.S. students ready to compete? The latest on each State's international standing." *Education Next* 11, no. 4 (Fall): 51–9 may be found at *http://educationnext.org/are-u-s-students-ready-to-compete/*.

The CHAIRMAN. Dr. Hanushek, thank you very, very much. That's very provocative—I mean, in a good sense. It provokes thinking.

Mr. Murnane.

STATEMENT OF RICHARD MURNANE, Ph.D., JULIANA W. AND WILLIAM FOSS THOMPSON PROFESSOR OF EDUCATION AND SOCIETY, HARVARD UNIVERSITY GRADUATE SCHOOL OF EDUCATION, CAMBRIDGE, MA

Mr. MURNANE. Thank you for the opportunity to participate in this panel today. I submitted our testimony on three topics: changing skill requirements in the labor force; second, disturbing trends in the distribution of skills; and, third, some ideas for improving American education.

I'll say a few words about the first two of these topics, highlighting some themes, although Senator Harkin and Senator Enzi have made this more difficult for me, because in your very nice opening statements, you said a lot of the points that I had hoped to make, and you did so very well, of course.

Technological change and globalization have quite dramatically altered the skills required in the labor force. In particular, they have reduced the number of jobs that might be characterized as doing routine cognitive work—filing is a good example—or routine manual work, assembly line work. Why is that? Because those are the jobs that are easiest to computerize or to send offshore. What has increased are jobs that require what MIT economist Frank Levy and I call expert thinking and complex communication.

Since a great many Americans learn a lot of those foundational skills that are needed to be good at expert thinking in the domain in which they work and complex communication, it's not surprising that the economic return to educational attainments have increased in recent decades, increased dramatically during the 1980s, and have continued to stay very high. So one obvious point that stems from that is that it's important that all American young people have the preparation to succeed in post-secondary education and the financial opportunity to undertake and succeed in post-secondary education.

However, I don't think it's right to say we ought to aspire to all Americans having 4-year college degrees. I mean, there are a great many jobs that are important in the economy that require less than a 4-year bachelor's degree.

But, all those jobs, whether they require some post-secondary education or training initially or people could start with them right after high school, will require over the course of a work lifetime some post-secondary education and training. And that's the reason why I think it is important that all students leave high school career- or college-ready, because they may not initially need subsequent education and training, but they will over their work lives, for sure, in order to remain productive and to earn a middle-class living, given the pace of technological change.

The third point connected to skill requirements is that the challenge of preparing all young people to be college- and career-ready is a new challenge. And the Nation's education institutions need to learn how to meet that challenge. It's not simply a question of doing the same things for longer hours. The problem is that the educational system that was sufficiently good for the economy of the 1960s, where there were large numbers of jobs with people doing the same thing over and over again, is not good enough for the economy of the 21st Century.

On the second topic—how are we doing in terms of providing these skills and educational attainments? And here, as Eric Hanushek has said, not nearly as well as we need to. And particularly disturbing are the growing gaps in skills and educational attainments between young people from relatively affluent families and those from relatively low-income families. That gap in mathematics and English language arts skills has grown by a third over the last 30 years.

That's really a very disturbing pattern because, clearly, those skills are very important in predicting success in post-secondary education. And, of course, that's why we see the pattern that Senator Harkin described, where the percentage of folks from top quartile income families who graduated from college increased by 21 percent, while the percentage of students from bottom quartile income families who graduated from college has only increased 4 percent, from 5 to 9 percent.

A stagnation of educational attainments, particularly of young people from relatively modest income families, from working-class families, is a pattern that really threatens the Nation's prosperity. It also threatens in a profound way a value that Americans of all political persuasions hold dear, and that's the idea that while a child may grow up poor, he has every reason to believe that if he or she works hard, his children will not grow up poor. And the path of this upward mobility for many generations of Americans was getting more education than their parents had. And that's a pattern that is seriously threatened today.

In fact, I'll close with this statement. For the first time, the average educational attainment of individuals who are retiring, leaving the workforce, is higher than the average educational attainment of young people entering the workforce for the first time.

Thank you.

[The prepared statement of Mr. Murnane follows:]

PREPARED STATEMENT OF RICHARD J. MURNANE, PH.D.

SUMMARY

I. CHANGING SKILL REQUIREMENTS

1. Over the last three decades, technological change and globalization have reshaped the occupational structure of the American workforce. Increasingly, work that consists primarily of carrying out routine cognitive tasks, such as filing, and routine manual tasks such as assembly line work, are either carried out by computer-guided machines or sent off-shore to lower wage countries. During this same period, work involving **expert thinking** in a particular domain and **complex communication** has grown in importance, primarily because these are tasks that computers cannot do well.

2. Since Americans learn a great many of the skills needed to excel at expert thinking and complex communication in formal educational institutions, it is no surprise that the labor market payoffs to educational attainments increased markedly during the 1980s and have stayed very high. Not all American youth want to pursue 4-year college degrees. Many want to enroll in 2-year vocationally oriented education and training programs. Some want to enter the military or the private workforce right after high school graduation. However, given the pace of technological change, almost all Americans will need to succeed in education or training programs over the course of their work lives in order to remain productive and to earn a middle-class living. For that reason it is important that youth leave high school with the tools to continue to learn effectively. One oft-used term is that youth should leave high school, **college- and career-ready**.

3. Providing all American children with the high quality education they need to leave high school college- and career-ready is a new challenge for U.S. educational

institutions, one that they will be able to meet only with new ways of organizing teaching and learning.

II. DISTURBING TRENDS IN THE DISTRIBUTION OF EDUCATIONAL ATTAINMENTS AND SKILLS

1. The gaps between the average reading skills and mathematical skills of children from relatively affluent families and those from relatively low-income families have increased by one-third over the last three decades. Gaps in college graduation rates between youth from top-quartile income families and those from bottom-quartile income families have also increased markedly.
2. The increase in family-income inequality in recent decades has contributed to the increase in income-related gaps in educational outcomes through two sets of mechanisms: growing differences in parental resources devoted to children and growing differences in the quality of the schools children attended.
3. The increasing gap between the cognitive skills and educational attainments of children from families in the bottom quarter of the income distribution and those in the top quarter threatens intergenerational upward socio-economic mobility and the Nation's prosperity.

III. IMPROVING AMERICAN K–12 EDUCATION

1. Schools that are effective in educating disadvantaged children well do much more than provide good instruction during a normal 9 a.m. to 3 p.m. school day.
2. Accountability and capacity building are essential complements, not substitutes.
3. The use of value-added models will improve education only if systematic attention is devoted to figuring out why children in some classrooms learn more than children in other classrooms.

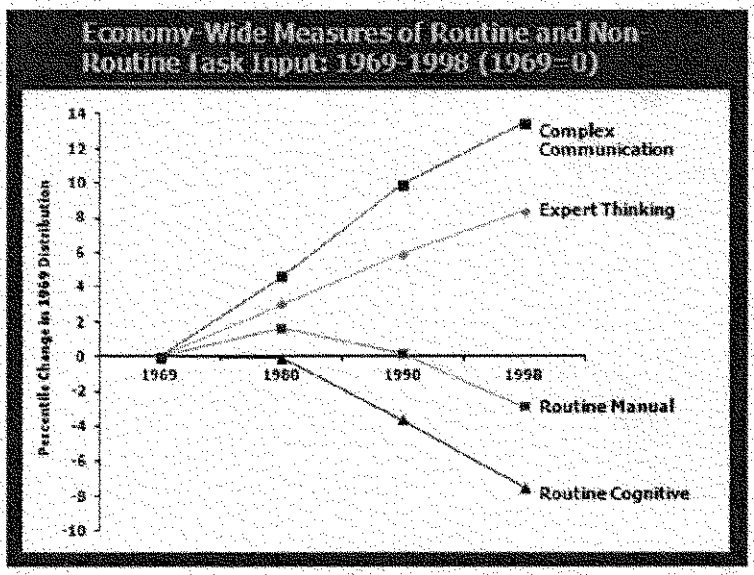
I thank the members of the U.S. Senate HELP Committee for the opportunity to submit testimony. My testimony consists of three parts, the first dealing with changes in the demand for skills in the U.S. workforce, the second dealing with recent disturbing trends in the distribution of educational attainments and skills among young Americans, and the third dealing with strategies to provide more Americans with the skills to be college- and career-ready. I make three points in each of the three parts to the testimony.

I. CHANGING SKILL REQUIREMENTS

1. Over the last three decades, technological change and globalization have reshaped the occupational structure of the American workforce. Increasingly, work that consists primarily of carrying out routine cognitive tasks, such as filing, and routine manual tasks such as assembly line work, are either carried out by computer-guided machines or sent off-shore to lower wage countries. During this same period, work involving **expert thinking** in a particular domain and **complex communication** has grown in importance, primarily because these are tasks that computers cannot do well. Figure 1 illustrates how changes in the Nation's occupational structure over the last three decades of the 20th century altered the types of tasks that the U.S. workforce carried out.[1]

[1] The evidence on changing skill demands and Figure 1 come from Murnane and Levy (1996) and Levy and Murnane (2004).

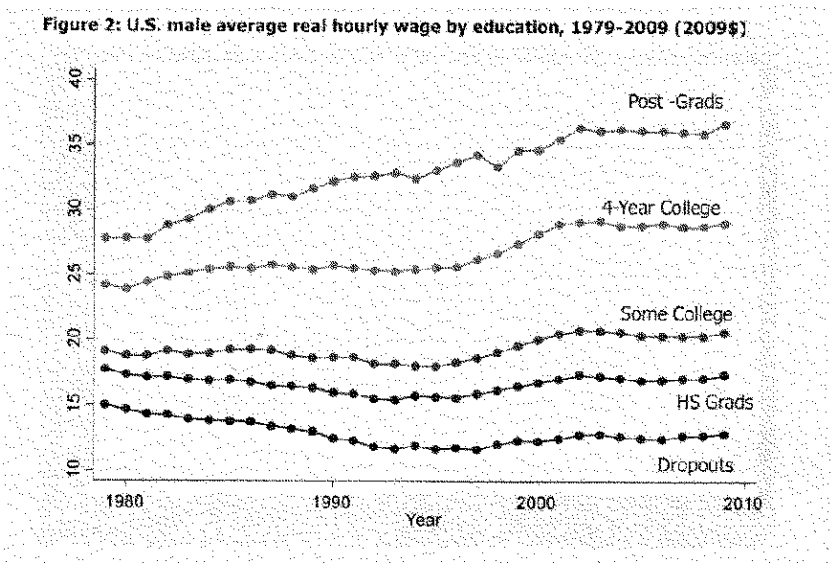
Figure 1



Key elements of expert thinking include a deep understanding of causal relationships in the domain of work, skill at pattern recognition, initiative, and metacognition (the ability to monitor one's problem-solving strategies). Key elements of complex communication include skill at observing and listening, eliciting critical information, interpreting the information, and conveying the interpretation to others both orally and in writing. Expert thinking and complex communication are not new subjects to add to the curriculum of the Nation's schools. They can and should be fostered in the context of teaching the traditional core subjects. For example, high quality science instruction provides a forum for teaching both expert thinking and complex communication. Indeed, a necessary condition for increasing the number of students who leave high school prepared to thrive in Science, Technology, Engineer, and Mathematical (STEM) college majors is science instruction that consistently enhances students' expert thinking and complex communication skills.

2. Since Americans learn a great many of the skills needed to excel at expert thinking and complex communication in formal educational institutions, it is no surprise that the labor market payoffs to educational attainments have increased in recent decades. This pattern is illustrated in Figure 2, which shows trends over the period 1979–2009 in the average hourly earnings (adjusted for inflation) of male workers with different educational attainments.[2] One lesson illustrated by Figure 2 is the importance of providing all American youth with the knowledge, skills, and financial opportunities needed to enroll in and graduate from post-secondary educational programs. I return to this lesson later in this document.

[2] Figure 2 is based on wage data from the Current Population Survey.

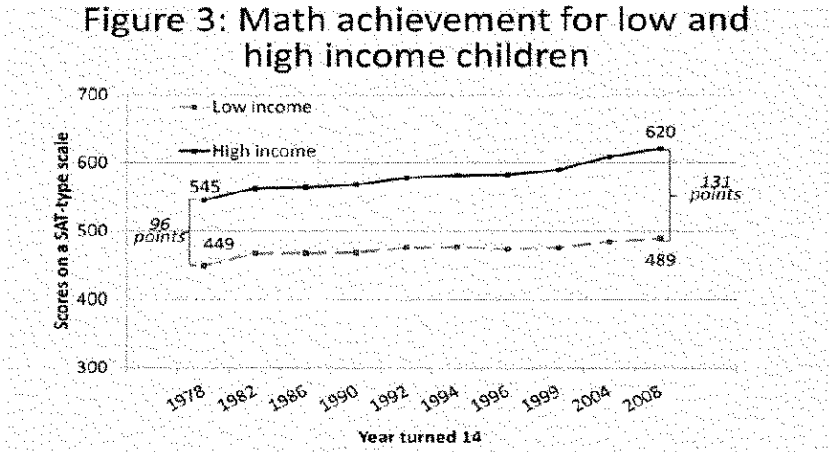


Not all American youth want to pursue 4-year college degrees. Many want to enroll in 2-year vocationally oriented education and training programs. Some want to enter the military. Some want to pursue traditional trades such as plumber and electrician and others want to enter new trades, many related to technology and health. These trades, some old and some new, provide many opportunities to do valuable work and to earn a good living. However, given the pace of technological change, almost all Americans will need to succeed in education or training programs over the course of their work lives in order to remain productive and to earn a middle-class living. For that reason it is important that youth leave high school with the tools to continue to learn effectively. One oft-used term is that youth should leave high school, **college- and career-ready**.

3. Providing all American children with the high quality education they need to leave high school **college- and career-ready** is a new challenge. The Nation's educational institutions did not tackle this challenge in the past because the economy provided a great many jobs that consisted primarily of carrying out the same task over and over. Workers needed to be able to read, do simple arithmetic, and follow directions, but that was enough for millions of jobs paying a living wage. It is these jobs that are disappearing. In summary, our educational challenge today is that the education that was good enough to support the economy of the 1970s is not good enough to support the economy of today and tomorrow. The reason I emphasize that the challenge is new is that the Nation's educational institutions are struggling to learn how to meet this challenge. It is difficult and uncertain work.

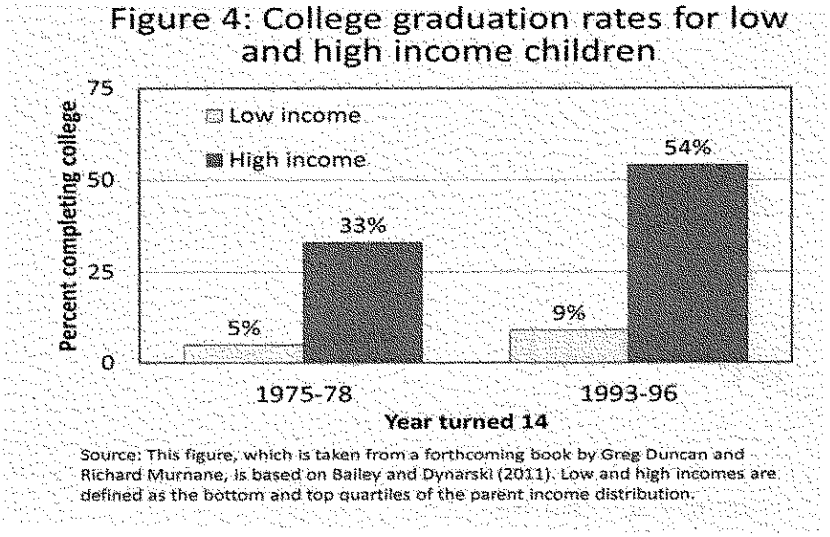
II. DISTURBING TRENDS IN THE DISTRIBUTION OF EDUCATIONAL ATTAINMENTS AND SKILLS

1. Given the growing importance of cognitive skills and educational attainments to success in the labor market, it is important to keep track of the extent to which American children from different backgrounds are succeeding in school. Recent evidence shows disturbing trends. Sean Reardon (2011) has documented that the gaps between the average reading skills and mathematical skills of children from relatively affluent families and those from relatively low-income families have increased by one-third over the last three decades. The growth in the gap in mathematical skills is illustrated in Figure 3.



Source: The figure, which is taken from a forthcoming book by Greg Duncan and Richard Murnane, is based on data presented in Reardon (2011). "Low" and "high" incomes are defined as the 10th and 90th percentiles of the parent income distribution.

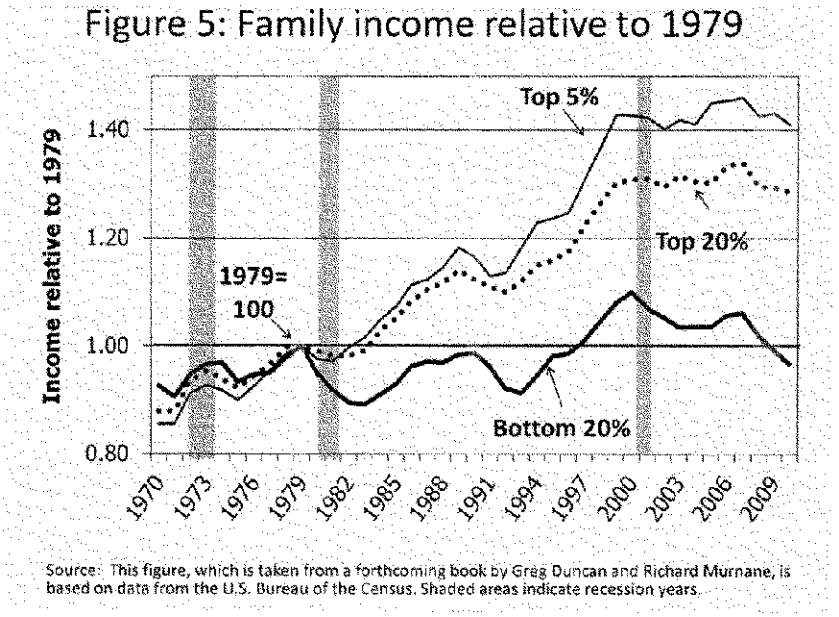
Given the importance of reading and mathematical skills for success in post-secondary education and training programs, one might expect that the growth in the income-related gaps in these skills would translate into a growth in income-related gaps in college graduation rates. Indeed, this is the case, as Martha Bailey and Susan Dynarski (2011) have documented. Figure 4 illustrates this pattern. Between the late 1970s and the mid-1990s, the college graduation rate of American youth from families in the top quarter of the income distribution increased by 21 percentage points, from 33 percent to 54 percent. During this period, the college graduation rate of American youth from families in the bottom quarter of the income distribution increased by only 4 percentage points, from 5 percent to 9 percent.



Source: This figure, which is taken from a forthcoming book by Greg Duncan and Richard Murnane, is based on Bailey and Dynarski (2011). Low and high incomes are defined as the bottom and top quartiles of the parent income distribution.

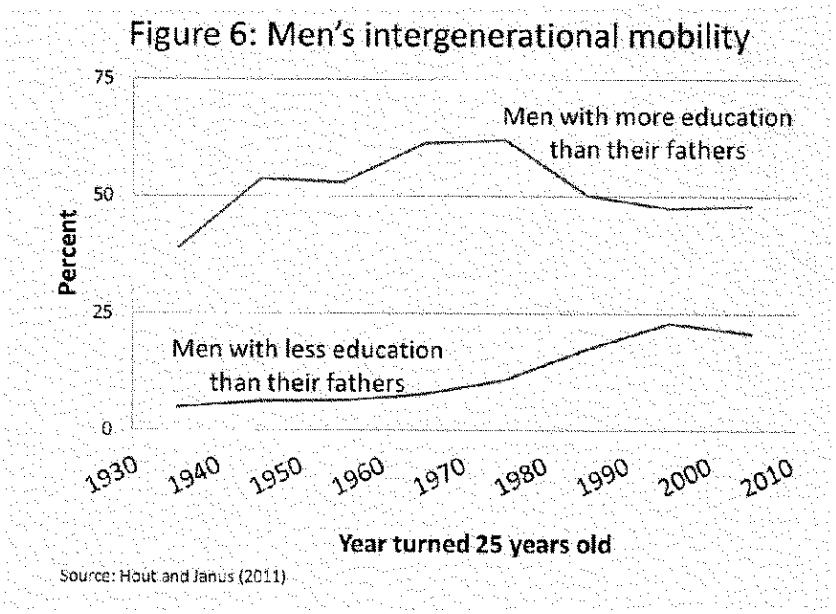
2. In recent decades, the gap between the incomes of families at the bottom of the distribution and those at the top has increased markedly. Figure 5 illustrates this pattern. Notice that the average real income (that is, adjusted for inflation) of families at the 20th percentile of the income distribution in 2009 was slightly lower

than the average income for comparable families in 1979. In contrast, the average income of families at the 80th percentile of the income distribution was 30 percent higher in 2009 than the average income for comparable families in 1979. The growth in real income for families at the 95th percentile of the distribution was even greater—more than 40 percent.

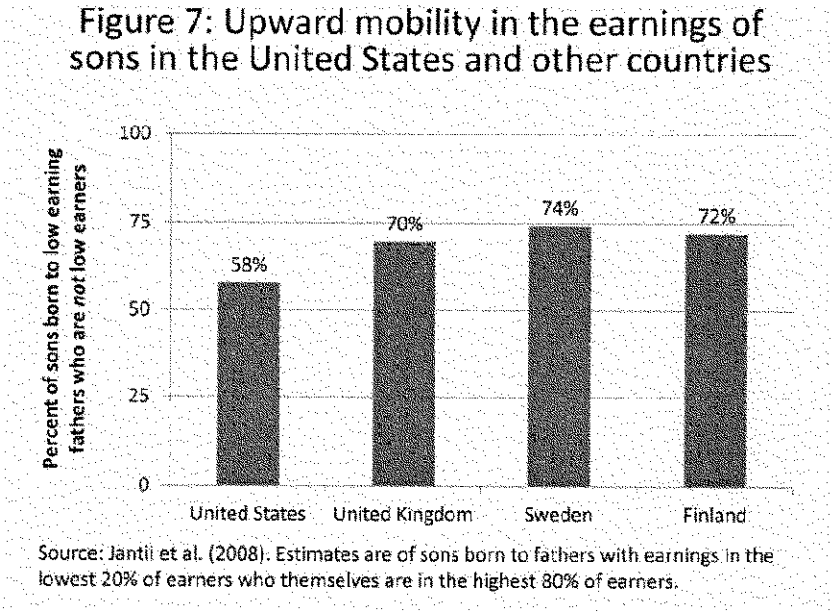


The increase in family-income inequality has contributed to the increase in income-related gaps in educational outcomes through two sets of mechanisms: growing differences in parental resources devoted to children and growing differences in the quality of the schools children attended. These patterns are documented in the chapters of the 2011 volume entitled *Whither Opportunity? Growing Inequality, Schools, and Children's Life Chances*, edited by Greg Duncan and Richard Murnane.

3. The increasing gap between the cognitive skills and educational attainments of children from families in the bottom quarter of the income distribution and those in the top quarter threatens a belief that Americans hold dear. This belief is that, while children may grow up in poverty, if they work hard, their children will not grow up poor. The mechanism through which this American dream has been realized for many generations of Americans has been access to a good education. During most of the 20th century, the majority of American children completed more education than their parents, and this provided them with access to better jobs and higher income. However, as Michael Hout and Alexander Janus (2011) have documented, this pattern no longer prevails. As illustrated in Figure 6, among men who turned 25 years of age after the mid-1980s, fewer than half completed more years of education than their fathers. Indeed, as the figure shows, more than 20 percent of men who turned 25 after 1990 completed fewer years of education than their fathers did. This is a sharp deviation from the pattern in previous generations.



The slowdown in the rate of increase of educational attainments of young Americans, especially those coming from low-income families, places in jeopardy upward socio-economic mobility in the United States. Indeed, a disturbing pattern that relatively few Americans are aware of is that the rate of intergenerational upward mobility in the United States is lower today than it is in the United Kingdom, Sweden, and Finland. This pattern is illustrated in Figure 7.



III. IMPROVING AMERICAN K–12 EDUCATION

As stated above, the country faces the enormous challenge of providing all American children with the skills needed to graduate from high school **college- and career-ready**. This means preparing them with the foundational skills they will need to excel at **expert thinking** and **complex communication** in their chosen field of work. How to meet this new challenge is a topic of considerable debate, especially whether schools serving high concentrations of children from low-income families can do the job alone. I make three points that I believe are critical to successful efforts to improve American K–12 education.

1. Schools that are effective in educating disadvantaged children well do much more than provide good instruction during a normal 9 a.m. to 3 p.m. school day. They also monitor closely the progress of every child and provide extra instruction and learning opportunities late in the afternoon to remediate learning problems. Many of these schools also provide instruction and learning opportunities on Saturdays and during the summer months.[3] Many also provide pre-school programs for 3- and 4-year-olds to prepare children to enter kindergarten ready to learn.[4] High schools that effectively serve disadvantaged students provide the learning opportunities in work places and in other non-school settings and the cultural experiences and tutoring that affluent parents provide to their teenagers.[5] In other words, schools that serve large numbers of disadvantaged children and youth well play a much larger role in their lives than a 5- to 6-hour schedule of classes for 180 school days.

2. Accountability and capacity building are essential complements, not substitutes.[6] Incentives and the accountability system in which they are embedded are important. However, incentives by themselves will result in improved performance only if teachers, administrators, and students know how to do the things that the incentives reward. This is not the situation in the Nation's schools today. Providing all students, including those from low-income families, with the skills to graduate from high school college- and career-ready is an unprecedented challenge for the Nation's schools. Incentives and accountability alone will not be sufficient for the Nation's educators to meet this challenge.

Investing in capacity building, including high quality academic standards, curricula aligned with the standards, and professional development aimed at improving the quality and consistency of instruction, is important. However, historically the Nation has devoted considerable resources to the development of curriculum and to professional development that have not improved the quality and consistency of the instruction children receive. Well-designed accountability systems hold promise to increase the effectiveness of investments in capacity-building. Of course, designing accountability systems that provide the right incentives is extremely difficult. Designing and implementing strategies to increase the instructional capacity of the Nation's schools is equally difficult. No government or private-sector organization designs effective accountability systems and capacity-building investments the first time. Consequently, States will need to redesign their educational accountability and capacity-building systems in the years ahead, and Federal legislation should encourage them to do so. In planning these redesigns, it is important to learn from the early efforts and to recognize that accountability and capacity building are essential complements. Pursuing one without the other will not produce better education for the Nation's children.

3. Increasingly, States and local school districts are using student test scores to evaluate teachers. Typically, they do so using statistical models called "value-added" models. Essentially, value-added models provide estimates of the average amount of academic progress, as measured by test scores, that students in particular classes made during a school year. This is important information, especially when the evidence shows that in 2 or more successive years, students who spent the school year in the classroom of a particular teacher made relatively little academic progress. However, it is important to keep in mind that there are several explanations for this pattern. One is that the teacher lacks the skills to teach well. A second is that the teacher was absent from school for a substantial period due to illness.[7] A third is that there were students with severe emotional problems in the class who would

[3] See Dobbie and Fryer, 2011.
[4] Weiland and Yoshikawa (2012).
[5] See Bloom and Unterman (2012).
[6] See Murnane (2008).
[7] See Miller, Murnane, and Willett (2008).

have disrupted the instruction of any teacher.[8] A fourth is that there was a great deal of mobility among students in the class, with many new students entering the class during the school year.[9] There is strong causal evidence that each of these situations reduces student learning.

That a group of students made little academic progress during a school year is a troubling problem. However, responding to this problem effectively requires an understanding of its cause. If the cause is poor teaching, then the response should focus on improving the teacher's effectiveness and, if that does not work, dismissing the teacher. However, this response will not improve children's education if the cause is one of the other possibilities. For that reason, it does not make sense to make decisions about which teachers to dismiss and which to reward with a salary bonus solely on the basis of the results of value-added models. Instead, it makes sense to use the results of these models to identify teachers whose students are making relatively great academic progress and those whose students are making relatively little progress. The next step is to use other methods, including classroom observation by well-trained coaches or supervisors, to figure out the cause of the atypical performance. Taking this step is critical to constructive use of the results of value-added studies.

SUMMING UP

I conclude by reiterating the three central themes of my testimony. The first is that changes in the Nation's economy have dramatically altered the demand for skills in the Nation's workforce. These changes have resulted in unprecedented challenges for the Nation's educational institutions. The second theme is that the gaps between the academic skills and educational attainments of Americans growing up in high-income families and those growing up in low-income families have increased substantially in recent decades. This growing inequality in educational outcomes threatens the Nation's prosperity and also places in jeopardy the upward socioeconomic mobility of which Americans are so proud. The third theme is that meeting the challenge of preparing all students to be college- and career-ready cannot be met by pushing teachers to work harder. To meet this challenge, American schools, especially those serving high concentrations of disadvantaged children, need to work differently and to play a larger role in children's lives than most play today. The policy challenge is to develop the knowledge, the capacity, and the accountability systems that will foster and support better schools for all American children.

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[8] See Carrell and Hoekstra (2010).
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The CHAIRMAN. Thank you very much, Dr. Murnane. All of these were very provocative statements. They get you thinking. Thank you very much.

We'll begin a round of 5-minute questions here. Boy, I don't know where to start on some of this. I'll start with Mr. Kolb first of all.

For years, I've been waving this book around. My staff is getting sick of me waving this book around. I show it to people, and I tell the story that I took over the Appropriations Committee on Education back around 1989, I guess it was. I think it was during the waning days of the Reagan administration that the President had asked for a study to be done on what we needed in education for the future.

And as my memory serves me, and I think documents show that it asked this Committee on Economic Development to do this because the President wanted to hear from the business community what was needed in education. I've always added as a paraphrase he didn't want to hear from any of those pointy-headed intellectuals in universities. He wanted to hear from the business community.

The Committee on Economic Development set up a committee to look at education. I will never forget when in 1990, I believe, or 1991, Jim Renier, who was the president or CEO of Honeywell, a man I didn't know, was the head of this group and asked to see me, made an appointment, came in, and delivered this book to me. And they had finished, I think—you can correct me if I'm wrong, Mr. Kolb. I think it was like maybe 3 years they had worked on this, 3 or 4 years they had worked on this, at least, anyway.

And if you look at the board, some of the most distinguished economic and business leaders in America were on this committee. The book is called *The Unfinished Agenda*: *A New Vision for Child Development and Education*. And, basically, what they came up with—and, again, I'll paraphrase a little bit here, they said that we must understand that education begins at birth, and the preparation for education begins before birth.

This report was put out by distinguished business leaders of America—this is 1990. This is 22 years ago and the report said we've got to focus more on early childhood education. And they pointed out time and time again how kids, if they don't get good education early on, then it just costs so much that maybe you never make it up later on.

My question, basically, for all of you is should we be focused more—and I know we're talking about higher education. We're talking about common core. There's other questions I have about

that—common core standards and such. But are we missing the boat on not focusing more on getting kids early in life—all these gaps, Dr. Murnane, that we're talking about, the gaps in achievement—does that start early on, when kids of low income—people have low expectations of them? And I just read a statistic the other day about how many low-income kids today come from homes where one of the parents is either in or has been in prison. It's alarmingly high.

What kind of expectations do they have of them, and how do we make sure that we have good early learning programs? So I just kind of throw that out for your rumination. Just think about it, and if you have any thoughts on that, I'd be glad to entertain it from anyone here.

Mr. Kolb, since I referenced your work and your committee.

Mr. KOLB. Mr. Chairman, thank you. And if you need additional copies of—if it's wearing out for you or your staff, we'll be pleased to——

The CHAIRMAN. You know, I actually had to go to the library to get one, because I did run out.

Mr. KOLB. We'll get a copy for you, your staff, and all the members of the committee, as well as the——

The CHAIRMAN. Do you think it's as relevant today as it was 22 years ago?

Mr. KOLB. Probably more, and the reason I say that, Senator, is that in your opening remarks, you used the phrase, "investment in the next generation." And we spend a lot of money on education in this country. But a lot of times, I don't think we approach it the way a business person would, namely, as an investment with a certain end contemplated.

If you look at how we treat our young people, how we invest in early education, again, we're near the bottom of OECD countries. You look at a country like France, which spends a lot less than we do, both in the aggregate and per capita, and yet they have one of the best early education systems in the world with their Créche system and their Ecole Maternelle system. We actually talk about that in a sequel to *The Unfinished Agenda* that we did 10 years ago.

What we've tried to do at the Committee for Economic Development is to build on what Jim Renier did. I actually met Jim Renier when I was in government working in the White House. And then I went to United Way of America as general counsel, and Jim was on the board at United Way of America. And then I come to CED, and he's on the board at CED, and I said, "Jim, one of us is a bad penny. We can't get rid of each other."

He is an example of a business leader, a business statesman, who gets it. And he became turned on to the importance of investing in early education through his work at CED. And he went back to Honeywell, and he created a program called Success by Six, which he then took to United Way. I didn't realize that he actually started this at CED until I came to CED. I'd heard a lot about it at United Way of America.

But then it went on to become a program in over 350 cities around the country. And it was designed to get young people to school, ready to learn—exactly that goal that we had under Presi-

dents H.W. Bush and Clinton that, of course, we missed and still continue to miss.

So it's a very important goal, and any business leader will tell you if you've got a problem, whether it's in manufacturing or the service, you don't fix it at the end. You fix it up front. You don't keep looking to fix it recall after recall. You fix it up front. So I think, as a country, we need to do more in terms of how we invest in our young people, both nationally, federally, at the State level, and also to add a little bit more rigor to the entire enterprise, and that does include K–12.

Thank you.

The CHAIRMAN. Dr. Hanushek.

Can I finish here? Thank you.

Doctor.

Mr. HANUSHEK. If I could just make a few quick comments, I think it's extraordinarily important to improve our early childhood education. I think at the same time it's worth recognizing that we already do invest a lot in early childhood education. It just hasn't yielded the results that we might want, that a large portion of our disadvantaged youth have some sort of preschool education. It's just not serving very well.

But it particularly doesn't serve them well when they go on into K to 12, because those that get ahead at the beginning lose it on bad K to 12 education, where we're still spending $600 billion. So, yes, early childhood education is important, but that's not going to solve our K to 12 problems.

The CHAIRMAN. When I get another round, I'll challenge you on that, because if they're not coming equipped to learn by kindergarten, then they're behind.

Dr. Murnane.

Mr. MURNANE. Could I just add something to that? I mean, you know, I think you need to think of early childhood education as a vitamin, not a vaccination. So you need the vitamin. You need kids to have a strong start. But it's really not enough. And one way to think about the difficulty of getting incentives and capacity building right is if you're a third grade teacher, and you're worried about the scores of disadvantaged students on third grade tests, what you focus your instructional time on in literacy is phonics.

Now, phonics are important, and they will get you a long way toward improving scores on third grade tests. But they won't help when the nature of reading changes from learning to read to reading to learn, and you're expected to make sense of science and social studies texts in upper elementary grades and middle school grades. So what you really need to do—yes, do some phonics—critically important, but you need to work on vocabulary conceptual understanding right from kindergarten up.

So that's a challenge, but for a second and third grade teacher, it doesn't pay off in test scores then. But it pays off in test scores in sixth and eighth grades. So that's the challenge in getting the incentive right so the whole school is aligned in preparing kids for these more complex literacy challenges as subjects change.

The CHAIRMAN. Excuse me. Senator Enzi.

Senator ENZI. Thank you, Mr. Chairman. I'll jump into that, too, because I recently got a report that Australia did on their early

childhood schools, and it was a very devastating report. It said that they were doing terrible. They were not focused. It had no tie-in with the later education. And the only high point in it for them was that they were doing far better than the United States.

[Laughter.]

Ms. Mann, I was really excited to see that somebody from SAS was going to be testifying. I used to be in the shoe business, and SAS was San Antonio Shoes—probably no relationship at all. But I appreciate your comments about helping to get kids algebra-ready, the tremendous increase in performance that that caused, and that you're sharing software with the schools for free.

I think one of the things we're failing to do in America is that we don't get people focused on a job. We're getting them focused on a free education and tests and going to school, but we're not getting them focused on a job. So do you think that that software and the algebra that you're doing gives them that kind of a focus? I mean, they're taking a look at coming to work for your company, I assume. Is that correct?

Ms. MANN. Thank you. The Algebra Readiness Initiative that you pointed out, I think, is a great example of looking at trends early on in a child's education and seeing where things maybe are falling short and being able to influence that at that point in time to get kids who may be at risk on a better path to success. And through the use of our technology, we've been able to look at trends in childhood education that we can use the same principles that we use for our customers in business—we can use that to the education system, which I think has been very helpful, and the Algebra Readiness Initiative is a great example of success in that area.

The other example that you pointed out—certainly, bringing kids very early on to SAS to look at how science and math is maybe being studied in the classroom and how you can apply that to real world examples—it sparks their interest. You see their eyes light up. It puts it into a whole new context. The other benefit is they get to see a corporate environment. They get to see what job potentials look like, what the environment can be if you do well in school. So there's really multiple things that we're achieving by engaging with education and students early on.

Senator ENZI. Definitely on the right track. Hope we can get more companies to do that.

Dr. Hanushek, I appreciated your comments about math being the main determinant. I'm a firm believer in that. In your testimony, you said that our education system needs a dramatic change if our country is to attain economic success, and I noticed you said that reducing class size and implementing the common core standards is just the beginning.

Could you give some other examples of the kind of change we need to see if our education system is going to perform at the levels of the higher performing countries like Canada and Finland?

Mr. HANUSHEK. The thing that I have focused on in my research and my understanding of schools is teacher quality and that that dominates almost everything in schools. Now, saying that teacher quality is important doesn't tell you exactly what to do about getting better teacher quality.

To me, as an economist, the key is getting the incentives right for everybody in the system so that everybody is working in the right direction. Part of that is a controversial issue that we ought to evaluate our teachers on their effectiveness, and we ought to pay attention to those that are doing well and those that aren't in serious ways, so rewarding those who do well and dismissing those that are not up to standards.

Senator ENZI. I appreciate that. I'll have some more detailed questions along that line. In fact, I have more questions for all of you. We never get the chance to ask them here, but they all become a part of the record if you'll be so courteous as to answer them when we submit them.

Senator ENZI. Mr. Kolb, I appreciate your comments about the Western Governors University and the success with the Stanford course on artificial intelligence. I wasn't aware of that. I think that does show some of the hunger and thirst in other countries, and when I visit other countries, they're always commenting about how they hope their students can come to the United States to attend college. So I'm a little disturbed now to find out that other countries are doing better and building better universities than we are.

But I think the Western Governors University and some of their online courses are a way for us to excel in a new way and touch people that haven't been able to go to school before. And maybe they'll do it with a lot less money than my alma mater, George Washington University, with their $50,000 tuition, which I never would have been able to afford. So I do have some more detailed questions on that, but I'm going to skip to Dr. Murnane in my remaining 4 seconds.

I'll go just a little over as you did, Mr. Chairman.

I appreciated your comments about the need for students to have expert thinking and complex communication skills. That's what most other countries think we teach in our country. For decades, the Federal programs have been targeted on high poverty students and the schools that serve them. And yet your testimony shows that the gap between low- and high-income students in math has increased dramatically since 1978.

What conclusion should we draw from that data that Federal programs haven't been effective in meeting stated goals, that they haven't been targeted enough, or is it something else?

Mr. MURNANE. One thing is, I think, all parents do their best to take care of their children. Parents have observed that these returns to education have increased, so parents with resources have invested heavily in preparing their children to succeed. Tutors, summer learning opportunities—they've done a variety of things to help their kids prepare that the parents with low incomes cannot do.

The other thing is, in terms of explaining this, is that we've seen increasing segregation by economic status, not race, by economic status in our schools. So low-income children are more likely to be in classrooms where other children are also from low incomes. And for a variety of reasons, that has negative effects on the learning. Among the reasons are they're more likely to be children who have emotional problems which disrupt instruction. It's harder to get skilled teachers to work in those schools. And, also, those students

tend to have high mobility rates out of the school, which has been shown to have a negative effect on instruction.

So I think those are tough things to compensate with just additional funds. It doesn't mean that funds don't matter. But it does mean that they need to be used in very creative ways. I think the Senate version of the new ESEA bill provides opportunities to use those funds more effectively.

Senator ENZI. Thank you. I will have more questions for everybody.

The CHAIRMAN. Senator—in order, Senator Bingaman.

Senator ENZI. I don't know if he's coming back or not.

The CHAIRMAN. Senator Bingaman, Senator Franken, Senator Whitehouse.

STATEMENT OF SENATOR BINGAMAN

Senator BINGAMAN. Thank you very much. Thank you all for your testimony.

Let me raise an issue. We've talked about how more early childhood education is important and how better teachers are important. And it's always seemed to me that—my experience in going through school was that the more time you spent studying, the more you were likely to learn. We do not provide enough time, instructional time, in our schools for kids to be expected to learn what we think we'd like them to learn anymore. We provide a lot less instructional classroom time than most of these countries we're comparing ourselves unfavorably with.

And I know this is a difficult issue to address, because, of course, it costs money. You've got to pay teachers more if you're going to make them teach additional weeks and additional months. It disrupts other things that we've built around the 180-day school year. But when we talk about how we need to make some major changes in the way we approach education, it seems to me one of the major changes we have to make is to recognize that, as a nation, we've got to move from a 180-day school year to maybe a 200-day school year, or maybe you just figure out how much instructional time there is and substantially increase that.

But one way or another, we've got to give kids more opportunity to actually learn. And I think that also deals with this gap that Dr. Murnane was talking about between kids whose parents can get them tutoring in the afternoons and get them in special programs in the summers and all that kind of stuff, and the kids who don't have those opportunities. If everybody had a greater opportunity to learn and more hours of instruction, then that gap would close to some extent—at least, it seems to me.

Dr. Murnane, is this totally wrong, or do you think there's an element of truth in it, or what's your thinking?

Mr. MURNANE. I think more instructional time is a necessary but not sufficient condition. And I think the evidence for this comes from particularly charter schools that have been effective in serving high concentrations of poor kids. They do have a longer school day. They often start at 7:30 with breakfast and they end at 5:30. They often have Saturday school. They have a longer school year.

But, importantly, they have found ways to track the assessment of every child very frequently and figure out where children are

lacking and then have used this longer instructional time in a very strategic way to deal with those deficiencies before they become a problem. I think a longer instructional period is necessary, but that alone won't do the job unless that time is used very effectively, and that really requires some learning how to do it, but it also requires strong incentives to use it effectively.

Senator BINGAMAN. Mr. Kolb.

Mr. KOLB. Senator, I'd like to comment, because you raise a very important point. I would use the phrase, time on task. Your question reminded me of a report that I read about 20 years ago. I think it was produced by the National Governors Association. I'm going to paraphrase what's in my memory here. But it said that the typical fifth grader—and this was pre-Internet, pre-computer—the typical fifth grader at home every day spent 130 minutes watching television and 5 minutes reading.

Now, I would submit to you that whatever you think about educational spending—increase it, decrease it, keep it level—if we can, as a country, figure out a way to flip those numbers, we would get better performance. It's a time on task. Our kids want to work smart, but not always work hard.

I would just add one other issue. It hasn't come up here, but it's something I'm a firm believer in. We short-change our young people in another area of education, on international studies and foreign languages. Now, why do I mention that? Because if you want to learn a foreign language, you don't take a pill today and wake up speaking Farsi or Mandarin tomorrow. You have to learn, listen, and practice and listen and practice.

Something like a foreign language, in my view, would actually change the habits of mind of a number of our young people and reinforce the notion that it's not only a Federal or State investment of money in your education. It's also important to invest your time both inside the classroom and outside the classroom.

We talk about wanting our young people to be lifelong learners. I know—I was fortunate. I started learning French at the age of seven, OK, and it's stayed with me now for over a half a century. And it has affected virtually everything I've done in my personal life and my professional life.

I know this is something which is often short-changed, but to go back to Chairman Harkin's opening comment, how we invest in our next generation is important. Investing in foreign languages and international studies will help reinforce that investment mentality which our young people need in addition to the school system and our parents. So I really appreciate you raising that point.

Senator BINGAMAN. Thank you, Mr. Chairman.

The CHAIRMAN. Do you want to followup on that? You've got more time.

Senator BINGAMAN. I don't. I think any question you ask, I'm sure would be very insightful. So I think I'll defer to you, Senator Franken.

STATEMENT OF SENATOR FRANKEN

Senator FRANKEN. Thank you for your confidence. Boy, I could be here all day. Thank you for your testimony. And I have some pre-

pared questions about the cost of post-secondary education I want to talk to Mr. Kolb about. But I've got—there's so much here.

Mr. Hanushek, I can't agree with you more that if we want to grow our economy, we need to invest in our education. On the other hand, Mr. Kolb was talking about the French educational system and spending less and yet getting better results. And you were talking about early childhood education and how effective that is in France. Mr. Hanushek, you talked about how many of our low-income kids have preschool education.

I will say that the evidence is that early childhood education is necessary but not sufficient, and we do lose some of the effect in K through 12 sometimes. But the evidence is that for high-quality early childhood education we get incredible benefits for every dollar invested. Art Rolnick from Minnesota has done that study, and we had him testify before this committee.

There are a lot of kids who qualify for Head Start who don't get it, and we need to make sure that they get it. And I like the emphasis by this Administration on the Race to the Top grants for early childhood, and we have a Promise Neighborhood in the north side in Minnesota. We also have a Race to the Top Early Learning grant in Minnesota. I was so impressed, by the way, with the Promise Neighborhood proposal that the north side achievement zone put together, and it had everything that everybody always talks about, including parental involvement, including—and getting started, as *The Unfinished Agenda* says, before birth, preparing for birth, because learning starts at birth.

On the one hand, I want to throw every resource we can at this. But we've got to do it smartly. For example, STEM is so important. I've been going around my State talking about STEM. The 20 biggest growing industries in my State—16 of them require STEM skills. You look at the United States on these charts that Mr. Hanushek put together and it's disgraceful.

I don't know where to begin, as you can tell. But I guess where I would begin is—we did a bill. We marked a bill up, which I think was a good bill, for reforming ESEA, for reauthorization of ESEA. One of the things that we talked about today was about tracking each kid, a tracking assessment of every child—one of the things we did in this bill was allow computer adaptive tests.

I want to ask the panel to talk about how important it is—how wrong-headed it was to have No Child Left Behind testing be this one test at the end of April, where you get the results at the end of June. The kids are gone. In Minnesota, the teachers and principals call them autopsies—how important it is to assess the kids throughout the school year and to measure the growth of every child and not have an arbitrary bar of proficiency. You should not only measure the percentage of kids who meet that proficiency because the teachers ignore the kids at the top and the kids at the bottom. Can anyone speak to that?

Mr. Hanushek. I only have 9 seconds left, so you've got my time.

Mr. HANUSHEK. I will speak quickly. I think that you're raising some very important issues. Let me say at the outset that No Child Left Behind, in my opinion, has some flaws, but it has dramatically changed the way we look at education. It has been an extraor-

dinarily positive impact, and as flawed as it is, it has led to improvements in our schools.

One of the improvements is that we can now trace students and find out who is actually learning and who isn't, and we can relate that to the programs and the teachers that they have.

Senator FRANKEN. I'm sorry to interrupt. But can we, really? I mean, are we really doing that? Because what I hear from teachers and principals is that by the time they get the results, the kids are out of school, and that the teachers have no way of keeping track of the kids that they're actually teaching or using the test to inform their instruction.

Mr. HANUSHEK. Senator, you're absolutely correct that we can think of testing in two different ways. One is in a formative way, where we assess students throughout the year, provide ready feedback, try to get better instruction to the individual kids. That's extraordinarily important, and we're starting to understand how to do that. We don't completely understand that.

The second way of using testing is in an accountability sense, in a summative way, and I think that that is also important. That was what No Child Left Behind emphasized—it, as I say, made a number of mistakes, one of which is not following the learning of individual kids. A second one is not using adaptive testing and providing immediate answers so we can do all of that.

But having that accountability system is extraordinarily important. And, in my opinion, if the Congress could find a way to reauthorize ESEA and improve some of the flaws but to continue that, it would be a very big help in part of the picture of how to improve our schools.

Senator FRANKEN. Dr. Murnane and Ms. Mann.

Mr. MURNANE. I would support Eric Hanushek in the extraordinary value of No Child Left Behind as a first step in having a set of accountability systems in 50 States that really does pay attention to the achievement of every child. But, again, this is new work, and we need to keep working on this.

One kind of concrete example in the science area, Senator Franken—science instruction provides a fabulous forum to teach these expert thinking and complex communication skills. Hands-on science, working in teams to develop hypotheses, figuring out how to test them—you collect data, you try and figure out what it means, and you try and interpret it and convey it to other people. But we still need to make progress on developing science assessments that provide the right incentives for science teachers to teach science in that way, as opposed to asking kids to memorize the parts of flowers, which doesn't make any sense when that information is available on the Web in 4 or 5 seconds.

So I think incentives are critically important, but we need to get them right so we attract the best folks into science teaching and they have the incentive to actually teach these skills that really will build most students' competence and interest in these STEM areas. And I think we've got a ways to go to accomplish that.

Senator FRANKEN. Amen. And I'm sorry, Mr. Chairman, but it seems like Mr. Kolb is bursting.

Mr. KOLB. Maybe I shouldn't do——

Senator FRANKEN. In French, please.

[Laughter.]

Mr. KOLB. Here's my point. I'm a recovering lawyer, not a psychometrician. So I'm going to be agnostic on exactly how you do the testing. But let me tell you what really worries me about this. In December 2010, when that PISA study came out from the OECD where we're doing so badly, about a week after that—you probably saw this—the Education Trust here in Washington put out a report that said that almost 25 percent of the high school graduates—I wasn't sure I heard it right on the evening news, so I went back and had one of our research people check it. Almost 25 percent of the high school graduates who took the Army entrance exam flunked it, with tough questions like two plus X equals four, solve for X.

How can that happen in America? We keep kicking the can down the road. How can somebody get all the way through high school, get a certificate, which presumably says they have a certain mastery of knowledge—and you can't do second or third grade math? So I don't personally care how you do the testing. I think we need more rigor along the way in our system coupled with the appropriate form of assessment.

But we are failing our young people if we are certifying them—this, by the way, wouldn't happen in France. I asked a French friend of mine about the baccalaureate in France. I said, "Is there anyone in the entire country of France who has passed the baccalaureate who couldn't answer the question two plus X equals four?" And I got laughter as a response. Of course not. But it happens here.

Senator FRANKEN. Thank you. And I'm sorry to run over my time, Mr. Chairman. The answer, by the way, is two.

[Laughter.]

The CHAIRMAN. And here you've beat me. I have my computer working on it right now.

[Laughter.]

Senator FRANKEN. You know you had your staff working on it.

The CHAIRMAN. That's my computer.

[Laughter.]

I'd like to open it up for general discussion here, but I wanted to connect two people or two things, Dr. Murnane and Ms. Mann.

Mr. Murnane, you said, "don't need 4-year degree for all; there are many good jobs that don't require"—you had that in your written testimony. Also here, if I can find it again, where I read it here—you said in the past, workers needed to be able to read and do simple arithmetic, follow directions, and that was enough to get a living wage. But those jobs are disappearing, and they need more now to enter the middle class than just what we needed in the past.

Ms. Mann, you talked about what your company had developed in productive partnerships with local high schools, where you made it clear how the skills they learn in the classroom translate into the workforce. I'd like to put these two together.

I just visited a community college in Iowa on Monday, and I met a young man there, 37 years old. He just had a high school education. He was now being retrained in a 2-year program in computer-assisted cutting of metals and materials. He had to learn

pretty intricate math to be able to program the computers to run the equipment.

What I learned there was a lot of the local businesses had this equipment that cost a lot of money. But local businesses had partnered with the community college to buy the equipment to put it in there to train new workers. The community college needed that kind of modern equipment in order to give instructions.

Back to you, Ms. Mann. If businesses in these different sectors, if they know the skills they need, how do we get more of them working with high schools? How do we get them talking to students and saying, "There are good jobs out there if you do this, and we will assist you in the schools."? Evidently, that's the kind of partnership you have with your high schools.

I want to get these two ideas together because I think there's something there that maybe we're not looking at. And in the bill that we worked on, on the reauthorization of ESEA, we called it college- and career-ready, not necessarily college, but also maybe career-ready.

So could you expand on that a little bit, about what you're doing in your partnerships with your schools?

Ms. MANN. Sure. And I think there are a lot of organizations like SAS that do have education as their philanthropic focus as we do and are trying to partner with the schools in their community. I think we just need to expand it and work collaboratively to do that.

But there are several initiatives. Over 10 years ago, SAS started working with a group called the High Five that was the five school districts in our area to partner with the educators and the business community to explore this topic, to look at what we could do together to improve the issues. The Algebra Readiness Project was part of that. Certainly, SAS played a large role in that because the assessment that was done—and this goes back to a comment which was made earlier about some of the assessments are, unfortunately, catching the trends too late, that the students are already failing.

This particular solution looked at 30 years of educational research to try to predict what the issues were going to be so that we could step in and make progress before the issues became more prevalent. And so I think there's lots of things that organizations can do, partnering with education, and also looking at how the use of technology can help solve some of these very difficult challenges in education. We could do that a little bit better, I believe.

The CHAIRMAN. Could you expand a little bit on that, Dr. Murnane?

Mr. MURNANE. Yes. I think if we look at where the really strong evidence is—high schools that are serving high concentrations of low-income children well—there are two very well-done evaluations using these randomized controls, which is kind of the gold standard. One is career academies that have been shown to, very interestingly, not to improve kids' test scores, but have led to improving how much they've earned 8 years after high school by 11 percent, by 18 percent for males. And these are almost all low-income males of color.

The followup work has shown that they did learn these cognitive skills—absolutely critical, as Rick Hanushek has said. But they

also had these opportunities to have internships and jobs in middle class workplaces, where they learned a lot of the social skills and communication skills that were absolutely central to helping them to find jobs and to move from one job to another.

The small schools of choice in New York City also have strong partnerships with employers who provide these kinds of opportunities that both help the kids to learn these other kinds of skills and also help them to see that the cognitive skills are actually worthwhile, because for a lot of very poor kids who don't know anybody who has that kind of a job, they seem totally unconnected to what they think as possible jobs. So I think these are promising opportunities.

The CHAIRMAN. Any others? I just picked on these two, but Dr. Hanushek or Mr. Kolb, do you have any thought? Again, the thrust of my question is getting the business community and those that know what kind of jobs they need out there, interacting more with the high schools to let students know that there are other options for them.

Mr. KOLB. Mr. Chairman, we were just in Milwaukee, WI, a couple of weeks ago doing a forum, actually, on post-secondary education. We did this at the headquarters of Manpower, which, as you know, is a global company. But what we heard were the examples like Ms. Mann talked about, more in the post-secondary area than in the high school. But I think it's the same principle.

You had companies like Johnson Controls, and I think there was an investment firm, Baird, which actually had partnered with 2-year and 4-year institutions to shape the curriculum that these companies actually needed to make sure that the education institutions provided the wherewithal for the students. And, of course, guess what? There were jobs at the end. I mean, the companies weren't doing this just because it was a charitable endeavor. It was a real win-win situation for everyone.

I think what we hope to do at CED is to look for other examples around the country and get those best practices out. But they are happening, and I think they can also happen at the K–12 level as well, because not everyone is going on to 4-year. Some may go on to 2-year or proprietary schools.

The CHAIRMAN. Dr. Hanushek.

Mr. HANUSHEK. Just one quick thought. I wanted to reemphasize what Dr. Murnane said, and that is providing incentives and motivation for students is extraordinarily important. We know that. Most of our public policy doesn't address that, because we don't know quite how to intervene with students and with families to get them more motivated. But anything we can do along the lines that he suggested is extraordinarily important, because the key element of all learning is the student, him or herself.

The CHAIRMAN. Thank you all very much.

Senator Enzi.

Senator ENZI. Thank you, Mr. Chairman.

Mr. Kolb, I didn't get to ask you a question before, and I know that your members have an interest in education, and they need an educated and skilled workforce. What knowledge and skills gaps are your members currently experiencing? Or are they able to find the talent that they need?

Mr. KOLB. If you were to talk with Jeff Joerres, the global CEO of Manpower Group or with Carl Camden from Kelly Services—and, by the way, a lot of people think of these firms as providing entry-level skill temporary jobs. People don't realize that both of these companies are global. But a lot of their business is placing people with Ph.D.s. So they see what's happening in this country and around the world.

I think both of those CEOs would tell you they have jobs that can't be filled. Some of them are because of STEM. A good number of them are STEM-related, and some of these jobs are paying in six figures. They're not just entry level temp positions.

I think the answer to the question, Senator Enzi, is going to vary around the country. But if you were just to focus—putting this question to Jeff Joerres and Carl Camden at Manpower and Kelly Services, I think, would actually provide more detail. I'll be glad to do that and go back to both of those CEOs and get some additional detail. But in talking with them as recently as 2 weeks ago, it's a problem.

Senator ENZI. I'd appreciate that. Those two companies probably have as varied a workforce as there is anywhere in the world, and they're providing a lot of different jobs. So, yes, I'd appreciate it if you'd do that.

Dr. Hanushek, what types of skills are needed to achieve the economic growth that you project? Simply saying that graduation rates and higher academic achievement is a bit simplistic. And aren't the higher skilled fields, such as computer science, engineering, mathematics—I know you've emphasized mathematics, and I appreciate that. Aren't they essential to our success?

Mr. HANUSHEK. Senator, I think they are. What I've emphasized is not the particular jobs, but the kinds of skills that lead into the various jobs. There was some astounding statistic about how many jobs today didn't exist 10 years ago. And so to think that we're going to aim for particular jobs is a little bit difficult. But we know the skills that are important. They're the cognitive skills that—everybody has said in one way or another here that developing high levels of cognitive skills are extraordinarily important.

Can the industries fill the jobs. I live in the middle of Silicon Valley and hear all of the firms there are both screaming about how they have jobs but they can't find the people, and, second, almost none of these firms would ever go to California schools or graduates of California schools to fill them. California schools are competing with Portugal and Greece internationally. They want to import people, which gets us into this other third-rail issue of immigration policy. But they're trying desperately to find people that are well-trained, and they're going often overseas to get these people.

Senator ENZI. And you emphasized teacher incentives, but I'm still trying to figure out some student incentives. I went to India and visited some of the people involved in education over there, wondering why they do so much better than we do. And I was kind of appalled at the things that I found out. The No. 1 thing they said was they didn't have any professional teams, so most of the students weren't trying to dribble a basketball or throw a football

or something so they could get one of those multimillion dollar contracts.

But the more disturbing thing was that they kick a bunch of kids out of school at fourth grade and again at sixth grade, and they only let 7 percent of the people go on to college, and that provides a competitive atmosphere that stimulates their kids. And, of course, we're not going to do that in the United States, where free education is—Dr. Murnane, did you——

Mr. MURNANE. Could I comment, Senator Enzi, on this question about skills, perhaps with a homely example. When you look for a staff, I'm sure you have applicants, all of whom do fabulously on cognitive tests. They all have 700 SATs. So the challenge is not to find those skills. So you clearly want that. You want people who have strong cognitive skills. But you want more than that, I presume. You want people who can get things done, who, when you ask them to do something that's unexpected, they'll say, "Ah, here's a new challenge," who will find colleagues to work with and figure out a plan to get that done.

I think all employers want this. They want the strong cognitive skills, but they want these other kinds of skills, a sense of liking new challenges, liking initiatives, recognizing they're going to need other folks to work with. So the question would be, thinking carefully, are we giving the right incentives to not only be sure that our instruction in schools teaches the kinds of things you can measure on the SAT, but also measures these other things that are critically important in our economy.

Senator ENZI. You're absolutely right, and you mentioned that in your testimony along with good communication skills. That's another thing that we kind of check our staff out for and are pleased when we find that.

Of course, at one of the most delightful hearings that I had—we had a lady testify—she was about four-foot-eight and African-American, and she had been made the principal of a high school in Tennessee. And they had multiple degrees there or certificates for graduation, and she did away with those, because she said every kid can learn.

What she instituted were the academies that have been mentioned a couple of times before, and she had a health academy and a building academy and several others. Her big joy was to find that some kids that thought that they could be a carpenter found out they could be an architect. But everything was focused toward getting a job, as Ms. Mann was mentioning earlier—a specific area of work—and then they were able to increase their horizons from there.

I think one of our big problems is getting the kids interested in education. Incidentally, she got promoted to superintendent because she did such a good job with the high school. And so her challenge was how to stimulate the kids in grade school. What she did was provide them with a list of prerequisites to get into the academy of their choice when they got to high school.

All of the prerequisites were the same, but they were focused toward that particular industry. She also said that every kid in high school learned exactly the same thing. They just learned it from the focus of what they were doing.

Again, I have used up my time, and I appreciate your answers. And I do have some much more specific things that I'll be asking if you'd answer that later.

Thank you.

The CHAIRMAN. Thank you, Senator Enzi.

Senator Franken.

Senator FRANKEN. Thank you, Mr. Chairman. I just got from my staff a statistic on Head Start for our conversation earlier. Fifty percent of children eligible for Head Start are not served by current funding. I think that is something—if we really, really are listening to the conclusions from *The Unfinished Agenda*, I think everyone here would agree that that's kind of a travesty.

I wanted to get into affordability of post-secondary education, but I want to follow on some of the things that both the Chairman and the Ranking Member were talking about.

Mr. Murnane, you were talking about what skills an employer wants. I ask this every time I go around Minnesota and talk to employers, and they always want critical thinking, creativity, teamwork. Those are the three things I hear about the most. Of course, they need the cognitive abilities, and they need to read and do math and those kinds of things.

I think that speaks to how we shape our tests, the assessments that we're doing on the kids. If you are emphasizing the knowledge of discreet little skills, which I think we're going to way too high a degree, you're doing two things. One, you're measuring kind of the wrong thing. I think the two consortia that design these tests are trying to work critical thinking into it.

But when you do that, teachers then feel compelled to teach these discreet little skills, and that's really boring. And it's not just boring for the kids. It's boring for the teachers. So you're basically driving good teachers out of the profession in some cases. I think it's doing a disservice in terms of how we're educating our kids and what we are measuring.

I also want to talk about this workforce—we need to reauthorize the Workforce Investment Act. We just need to do it. We had a hearing here with four workforce boards from across the country who had done extraordinarily great jobs, and we had this like a month ago or something. What it really required in each case was some leadership. It was pretty simple. There was nothing, necessarily, that we could do other than provide some structure and funding.

But it was somebody from the workforce board or two or three people from the workforce board. It was people from industry, whether the industry was manufacturing—in many cases, it was—or whether it was healthcare, and it was the 2-year colleges, the technical schools. And there's a technical school in Minnesota—Alexandria Community and Technical College ranked eighth in the country as a 2-year school—that does a wonderful job in Alexandria, MN, which is sort of the Silicon Valley of food packaging machines.

But what they do is they reach down into the high school, and they have a camp, a summer camp, that teaches industrial arts, and they recruit from their high school. And I remember when Minnesota had like a 7.7 percent unemployment rate across the

State, Douglas County had like 4.6 percent, and it was because of this. And the skills gap is there, and if we could close that gap, millions and millions of people could be working today, now.

Mr. Kolb, I know that there's an upcoming report from the Committee for Economic Development that will look at ways to drive reforms across the post-secondary sector. Can you preview some of those reforms, and especially in relation to the ability of 2-year schools to provide the kind of skills and do them in the kind of ways—because Mr. Hanushek is right. Jobs are going to change. Jobs are just going to change. The nature of work is so different now than it used to be.

And so you can't prepare someone for a job for 20 years from now except to give them the kind of cognitive skills and the creative thinking and the critical thinking. So can you highlight something from the upcoming report that speaks to this?

Mr. KOLB. Sure. I'd be pleased to. First of all, Senator Franken, we're going to focus on what are called broad access institutions, not the elite research institutions. That's not where most Americans are going to go for post-secondary education. It's the State 4-year, 2-year community colleges and also the post-secondary sector.

We think that the business community should be involved with State officials and that could involve workforce groups like we saw in New Orleans. I was in New Orleans on Monday and Tuesday. They have a similar group that is thinking along exactly these lines. But we want business to work with State officials to help set very explicit tangible goals for awarding post-secondary degrees and certificates. We've given a couple of examples of that this morning, but it needs to be magnified tremendously, and the more you do that, the more I think you'll have examples of those jobs being filled with people who have the necessary degrees.

We think that business has a role in helping States in strategic financial resource allocation. How is the money being spent? Is the money being aligned with goals that relate to productivity efficiency? I actually think the business model of post-secondary education is going to be up-ended. And business leaders, more so than educators can deal with that type of change, and we've seen that in a number of areas. They're used to it. They've been through it themselves over the last 20 years, so they can be an ally of the State institutions.

Business can help set annual indicators and metrics and work in partnership with the State 2-year and 4-year institutions. They can conduct policy audits. We're going to recommend annual statewide education summits that would bring together business and the post-secondary institution to focus on goals.

Let me just conclude with one other point. It hasn't come up this morning, but when I talk about post-secondary education and the importance of the workforce, it's also important to approach these issues from the perspective not just of work, but also democracy. If we are to have a vibrant democracy, we need educated citizens, because democracy is all about making choices.

So a lot of people say, "Oh, well, you're just about trying to produce more drones for the business sector." No. It is important that we have talented, qualified, certified people to get jobs. But it's

not just about jobs. It's about the health and vitality of our democracy.

Senator FRANKEN. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Franken.

Again, let me address something—Dr. Hanushek and Ms. Mann, I want to involve both of you in this. It's perhaps a little bit narrower, and it has something to do with what we have been discussing a lot in our committee and involved in our ESEA work.

Ms. Mann, you expressed support for the Common Core State Standards initiative.

Dr. Hanushek, you said in your testimony I read last night,

> "My message is simple. The gains from improving our schools—or the costs of not doing so—are enormous. They are large enough that we should be willing to consider major alterations in policies." I'm going to set that aside. You say that, "We know that changing things around the margin—like moving to smaller class sizes" or master's degrees "or introducing the common core curriculum—have little hope of redressing the problems."

I don't mean to have you two debate this, but I'm trying to figure out exactly what you meant by that, Dr. Hanushek.

I want to know why you feel that the Common Core State Standards initiative is a pathway that we ought to pursue.

Dr. Hanushek.

Mr. HANUSHEK. I'm happy to start. It's not that I'm against standards. I am for standards. But when I look around the United States today, there are widely different standards, learning standards, across the 50 States——

The CHAIRMAN. Right.

Mr. HANUSHEK [continuing]. Some of which are by most ranking systems more advanced than the common core and many of which are not up to the level of the common core. If I simply correlate the standards, the rigor of the standards, with the performance of students, I get a negative correlation.

The CHAIRMAN. Say that one more time for me so I can understand.

Mr. HANUSHEK. There are rankings of the standards in the 50 States today. If I take those rankings, which are often on an A through F basis by a couple of different rating agencies, and correlate those with NAEP performance on the test that relates to the standards that are being used, they are negatively correlated. The States with the highest standards, in fact, tend to have somewhat lower NAEP performance of their students than those with high.

Now, that's not an argument necessarily against standards, per se, but it does say that there's a lot more to actually getting students to learn what is included in the standards and that is where I would put my emphasis. I view that the debates over common core, which seem to be heating up, as I see them, are a bit of a distraction to me, because whether we get them or not is not going to ensure that any student in any State actually learns them.

The CHAIRMAN. It was my idea that the common core standards was not the top. It was sort of the common core—other States can go above that. But at least we've got a common core that no State

goes below. That's sort of what, as I understand, what the common core movement was about.

Mr. HANUSHEK. I think it is trying to establish a floor. There are some debates about whether States such as Massachusetts and California that emphasize eighth grade algebra, for example, can fit them in readily into the common core. These are details that are really inside baseball. I'm just suggesting that moving to those standards is not going to solve the problem that California, with its A-rated standards by most metrics, is performing at the level of Portugal and Greece.

The CHAIRMAN. OK. I get that. I get that.

Ms. Mann, you emphasized in your statement the usefulness, the necessity of common core standards.

Ms. MANN. Yes, and I think the point there is that we support many of the initiatives that are being looked at right now, that are being delivered on right now. I don't know that I disagree with what Dr. Hanushek is saying. That is not going to be what changes the situation.

But it's certainly a good starting place that we all have standards with which we will not allow our students to drop below. And that was just suggesting support for that initiative, not, again, to say that that was going to be the thing that was going to have the biggest influence. I think all the discussions that we've had today—it requires a combination of all those things—investment, the quality of our teachers, and the partnership with businesses and education are very critical as well.

The CHAIRMAN. Dr. Murnane, did you want to comment?

Mr. HANUSHEK. Could I just add one note to this——

The CHAIRMAN. Sure.

Mr. HANUSHEK [continuing]. And link it back to what Senator Franken said? One of the big advantages of the common core standards may be to drive the development of better assessments, which I think has been one of the problems since NCLB came out. I expected the assessments to get better as the tests were made available and people saw the scores and so on, and they, frankly, didn't. And so the common core may, in fact, drive better assessments, which has considerable value in our setting up the right incentives.

The CHAIRMAN. Dr. Murnane, I know you——

Mr. MURNANE. That was half of what I wanted to say. The other half is—what I think can make a difference is—if you look at countries that do very well on these tests that Dr. Hanushek has described, they almost all have national standards and many have national curricula. Now, I understand that education is the obligation of States in the United States. Dr. Hanushek also spoke about the importance of having more effective teachers, and I completely concur. Well, how do we get there?

One thing is pre-service education of teachers isn't very good. I think the reason is that in the United States, if you are a university professor trying to teach aspiring teachers how to do mathematics, you can't focus on "This is what the mathematics is going to look like that you're going to be asked to teach," which is very different than a case in Singapore. You could say,

"Well, you may be asked to teach a very traditional curriculum. You may be asked to teach a very constructivist curriculum. So we can't specify this."

That is an enormous hindrance to preparing teachers.

If we had greater clarity on what is important for children to learn and how we're going to measure these things, I think it would go a long way toward improving our education and professional development for teachers, if done very well. And that, of course, is the major proviso.

The CHAIRMAN. Thank you.

Senator Franken, we'll bounce back to you.

Senator FRANKEN. First of all, I would love to see this NAEP—the correspondence or the negative correlation, because I know Minnesota has pretty high standards and does very well, and I know Massachusetts has very high standards and does very well. I remember Tennessee was very high in the percentage of kids who met proficiency in math, but then on the NAEP test was right at the bottom.

That hasn't been the experience that I've seen. But I'm sure—I'd just hope we could see that.

Also, when you compare the—say California is comparable to the Portuguese and the Greeks, I would think the Greeks, especially in geometry, would be great.

[Laughter.]

But maybe I'm wrong.

Mr. HANUSHEK. You may be surprised.

[Laughter.]

Senator FRANKEN. OK. Let me just ask on postsecondary—again, you were talking, Mr. Kolb, about involving business, and I can't agree more. I mean, this is one of the things that I see in Minnesota that was at Hennepin Technical College. Hennepin County is the county that Minneapolis is in, but it's the biggest county in Minnesota and involves a lot of suburban schools, too.

Basically, what happened was the manufacturers just said, "This is what we need," and they designed a curriculum. And Hennepin Technical College did the curriculum, and it was called M-Powered. They've graduated about 300 students thus far, and 93 percent of them have permanent jobs.

Ms. Mann, I just saw your hand go up. That sounds like you want to respond.

Ms. MANN. I wanted to give an example that SAS has been involved with that I think has had a similar success. We worked with North Carolina State University to implement an Institute for Advanced Analytics. So it's a master's program focused on analytics. And we're in our maybe fourth year now, and the graduates from this program all have received job offers, and the average starting salary is over $80,000 a year. So this is another good example that we've seen by partnering with universities to help them build out the curriculum that we think is important.

Senator FRANKEN. Mr. Kolb, I want to ask you again about the Committee for Economic Development's report and what role business can play in working to address college costs, in terms of their business expertise, because a lot of businesses, you know, have to adapt all the time. As Congress examines these proposals and

works to address college costs, from the business perspective, what are the most important items to hold colleges accountable for, and how can business help our colleges and universities and 2-year institutions?

Mr. KOLB. Senator Franken, I think the short answer is to look at the same strategies around innovation, productivity, efficiency that are typical questions that the leaders of American business have had to deal with. And as I said earlier, they are not typically questions that show up on the campuses of 4-year schools and 2-year schools.

The model that we've had, really, since the GI bill, has been good up until now. It's been pretty much investing in bricks and mortar. And most college and university presidents are chief development officers. If you look back when CED was founded, Robert Maynard Hutchins from the University of Chicago was one of our founding trustees. You'll think of people like Kingman Brewster or Derek Bach who played a real role in the intellectual life of the country. And that's typically not the case now.

I think that business can help the leaders of our post-secondary institutions rethink how they are going to spend their resources. One of the best models is Western Governors University, which is headed by a former senior executive from IBM. So what we hope to do with our report is to go around the country and identify the Jim Reniers of business, if you will, people who are going to get involved and help with exactly the type of relationship that Ms. Mann has talked about, that we've seen recently in New Orleans and also in Milwaukee. We know it's out there.

But a lot of business leaders 6 years ago would tell me, "We don't see what the problem is. We sit on the board of our alma mater and things look fine." You can't say that now. The competition, the global challenges that we've heard about, are just too great. And so I think it's not going to be easy, but we need business leaders to get involved, and that's the niche of the Committee for Economic Development.

I can't tell you where it's going to be in 5 years. I know it's going to be different. And, hopefully, we're going to identify the Jim Reniers of post-secondary education. We have a few already.

Senator FRANKEN. I want to thank all of you. I, unfortunately, have to go. I could stay here all day and talk to all of you. Thank you for your testimony. Thank you for all the work that you're doing.

And thank you, Mr. Chairman, for this hearing.

The CHAIRMAN. Thank you. I agree with you.

We're going to have to break up, but I'm going to ask the last curve ball question. You're not going to like it. You can only change one thing. You get one opportunity. You're the dictator. You're the king. You can change one thing about our education system, only one thing. What would it be? You only get one shot at it.

I'm going to start with Ms. Mann and just work down the aisle. Or should I call on you? Who wants to go first?

OK. Dr. Murnane.

Mr. MURNANE. Improve assessments.

The CHAIRMAN. Improve assessments.

Mr. MURNANE. So that the Nation's best teachers feel that if they do what they consider their very best teaching to prepare our children to succeed in life, that they will do well on those assessments.

The CHAIRMAN. OK. We'll go down this way.

Dr. Hanushek.

Mr. HANUSHEK. Mine is simply to improve the evaluation of teachers and use those evaluations in making personnel decisions.

The CHAIRMAN. OK. Fair enough.

Mr. KOLB. I would recommend a national—not necessarily a Federal, but a national high stakes exam equivalent to the French baccalaureate.

The CHAIRMAN. And that would be in high school?

Mr. KOLB. Yes.

The CHAIRMAN. A national high school exam.

Mr. KOLB. At the end of high school, like the French baccalaureate, along those lines.

The CHAIRMAN. OK.

Mr. KOLB. Lest I get fired from CED, that's my view. It's not the official view of the Committee for Economic Development. We haven't focused on that. But it's my own thinking.

The CHAIRMAN. OK. Got that.

Ms. Mann.

Ms. MANN. A stronger focus on computer science in education as well as improve the quality of the teachers and the incentives that they receive.

The CHAIRMAN. So about three out of four was assessments, and I assume when you say improve assessments, you meant teacher assessments?

Mr. MURNANE. No.

The CHAIRMAN. What did you mean on that?

Mr. MURNANE. Assessments of students, because unless the student assessments really do capture what our best teachers are trying to teach, then I think that's the Achilles' heel for the plan that Professor Hanushek is describing.

The CHAIRMAN. OK. And that would start in elementary education.

Mr. MURNANE. And go all the way up.

The CHAIRMAN. All the way up.

Mr. MURNANE. Including post-secondary.

The CHAIRMAN. Thank you all very much. Again, I'm still focused on early, early learning. Head Start reaches only half. Who mentioned that? Senator Franken mentioned that 50 percent of eligible preschool—eligible—that's low income—50 percent, but it reaches only 4 percent of eligible babies and toddlers, 4 percent.

Childcare Federal subsidies serve only one out of seven eligible children. I've worked very hard in healthcare on putting more resources into prevention and wellness. Invest up front rather than patching and fixing and mending at the backend.

I still ask all of you to keep thinking about—are we doing enough in the early years to get kids ready for school in those early, early years—everything from nutrition to intellectual stimulation, challenges for young kids. I've been at this a long time and I asked you what you would change. I'm still thinking more in terms of how we focus on these early, early years.

I'll take this to heart, what you said, and it's assessments, evaluations of teachers, the high school exam, teacher incentives to get our best teachers. I'm reminded that in some countries, they take the top students in high school and give them full scholarships and that is if they go into education, into teaching. And we don't do that in this country.

I'd sum up by saying that, as you said, Dr. Hanushek, we were tinkering around the margins. I guess that's what we do around here. We tinker around the margins a lot of times. But if we get enough margins, maybe we can affect the central core. But sometimes that's the best we can do.

This has been very provocative, as I said many times before, and thank you for your input on this. As we proceed, I'd just ask you, if our staffs can continue to reach out to you and ask for your input.

I never got to you again, Dr. Hanushek, because you said something about the margins, and you said we need to make major changes, and I didn't ask you what those were. Maybe if you could send those to us.

Mr. HANUSHEK. I'd be happy to respond.

The CHAIRMAN. I'd love to have your thoughts on what you consider to be the major changes that we ought to make rather than tinkering around the edges.

Again, thank you all very much. We'll leave the record open for 10 days, until March 22d. I want to thank all my colleagues for their hard work on this. This is an issue that we will continue to have further hearings on in this committee and try to develop. This is part of a series of hearings that I've called for on rebuilding the middle class in America. And, obviously, you're not going to rebuild the middle class unless they have good jobs and economic opportunity, and that all comes back to education.

Thank you all very much. I appreciate it.

[Whereupon, at 12:05 p.m., the hearing was adjourned.]

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