Testimony of Jenn Mann, Vice President Human Resources, SAS
to the United States Senate Committee on
Health, Education, Labor and Pensions
"The Key to Global Competitiveness: A Quality Education"
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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, North Carolina, 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 decision maker 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 time frames, 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% 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 US and abroad that SAS is "a great place to work", according to Fortune magazine. For 2012, SAS ranks number 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%, versus 20% 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 two-fold. 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 on-site 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 US 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% of high school graduates in 2011 were ready for college work in math and 30% in science;
- In 2009, only 34% 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, US 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 % of White/Asian American freshmen students intended to pursue STEM studies and 34.1% 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% of White students completed STEM degrees within 4 years, and 32.4% of Asian American students finished within 4 years. Comparative statistics for Latino, Black and Native American students are 15.9%, 13.2% and 14.0%, respectively. The five-year completion rates, respectively, for all groups are: 33%, 42%, 22.1%, 18.4%, and 18.8%. 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 opportunities 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 two years. For those on the committee not familiar with this high school, it serves a predominantly low-income student population, with roughly 70% 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 one-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% 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 in were actually enrolled in Algebra 1 for the 2010-2011 school year. As a result, 8th grade enrollment in Algebra I increased by an average of 38% across the districts, and 96% 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 US. 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 US 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.