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Mr. Chairman, Senator Dodd, members of the Committee, it is an honor to be here today to discuss America's competitiveness in the 21st century global economy – and the role science and math play in meeting those challenges.

The United States faces a competitive challenge not only from foreign companies but from foreign workers. Across the U.S., many corporate executives are saying there aren't enough Americans with the skills to fill job openings. Just last week, the vice president of human resources for the world's largest privately held software company – which is located in the Triangle – stated he needs employees with graduate degrees in math, statistics and computer science. It has become alarmingly clear we are falling short when it comes to producing the talent companies like this need – and preparing students for the pursuit of these degrees. We are paying the cost.

Alan Greenspan was right when he said, "the United States has achieved its economic [and political] standing in the world based largely on the entrepreneurial spirit and high skill level of its citizens." But, a practical question still remains. Will workers in the United States have the skills necessary to compete with workers in China, India and South Korea in the 21st Century? I'm talking about ***intellectual capital***: Creativity. Innovation. Entrepreneurship.

Americans can – and must – compete in today's ***global economy*** but it will take ***strong leadership and a bold new emphasis*** on K-16 education. It will take a ***renewed commitment*** to bring students to a higher level of competence – not only in math and science curriculum but also in creativity, innovation and entrepreneurship. It will take a ***significant investment*** in human capital for each and every U.S. citizen in order to maintain our competitive and comparative advantage. Senate Bill 2198 is a good first step in achieving a new level of creativity and innovation among our nation's students to enable them to successfully compete.

I have had the opportunity to travel the world on numerous trade missions to China, India, and South Korea and other developing nations. What I have witnessed on these trade missions has opened my eyes to the challenges that exist for our nation. Countries around the globe are educating students to compete in the ***knowledge-based economy***. These workers can do the same work as U.S. workers from anywhere in the world – for less than a fifth of the cost. This presents us with a real challenge. There must be a sense of urgency not only among our political leaders but among all Americans. There is no greater time to forge ahead with ***bold initiatives*** to educate our citizens if they are to be prepared to compete globally.

According to a 2004 report by the National Center for Education Statistics, of the 30 countries composing the Organization for Economic Cooperation and Development, the United States ranks 15th in reading, 18th in science, and 24th in mathematics. In addition, the United States ranks 7th out of the G8 countries in 10th grade mathematics. We don't have to look far to see what could be considered a contributing factor. According to the latest poll conducted by Public Agenda, parents don't see the urgency of science and math. ***There is a clear disconnect here***. Policy makers and employers clearly see this slip as a threat to the nation's economy. But, if our parents don't understand the importance, we can't expect our students to. America ***can*** do better. For the sake of our nation's economy, and the quality of life for our citizens, ***we must***.

For several decades, North Carolina has proven to be a national leader not only in education reform, but also in preparing students for the changing economy. During my four terms as governor, North Carolina set the goal of being first in the nation in terms of the quality of its education system. We demonstrated ***strong political leadership*** and ***consistently communicated with citizens*** the need to improve education in terms of its connection to the economy. And, we ***partnered with the business community*** to achieve a clear understanding of the skills necessary for employment in the changing economy and to gain their assistance in driving education reform.

In addition, we focused ***on supporting our teachers to improve instruction and increase recruitment and retention rates***. We also ***established high standards for our teachers, administrators and students and created assessments to evaluate those standards***. Collectively, these efforts resulted in North Carolina students achieving the largest gains in math and reading achievement in the nation on NAEP testing between 1990-2002.

Despite all of our efforts to improve education, it wasn't enough. North Carolina, much like the nation as a whole, has faced a period of dramatic economic transition. Jobs in our agriculture and manufacturing sectors ***dramatically declined***. Within a 10 year period, ***our state lost more than 180,000 manufacturing jobs alone***.

Nearly 50 years ago, the vision of policy makers and business and education leaders led to an investment in 21st century industries. This included biotechnology, telecommunications and computing. Today, that vision is Research Triangle Park – a public-private research planned research park that houses some 136 companies and employees nearly 38,000 people.

These visionaries understood that proper education and training of North Carolina residents would be critical to establish a workforce capable of taking advantage of these growing industries and job opportunities. Through the years, North Carolina sustained that bold commitment to support math, science and technology education.

One example of our commitment to science and mathematics education is the North Carolina School of Science and Mathematics (NCSSM). The school opened in 1980 as the first school of its kind – a public, residential high school where students study a specialized curriculum focused on science and mathematics. NCSSM teaches science mathematics and technology using practical applications used integrated teaching methods. The curriculum is inquiry based – ***focusing on engaging students in mathematics and science through applications that relate to***

specific real life applications and employment opportunities. The school has nearly 650 students and teaches another 380 students across the state using distance learning, or online virtual courses. NCSSM administrators and teachers also ***work with teachers in rural areas to help them improve their instructional methodology***.

NCSSM ***has forged partnerships with a number of businesses*** including IBM, which has provided $2 million to help enhance instructional technology and teach 21st century skills. The results have been exceptional. NCSSM has produced 33 Siemens Westinghouse prize winners – the nation's premier high school science competition judged by Nobel Prize winners – in the last three years. ***More than 75 percent of NCSSM graduates are working in the science and technology field and making significant contributions***.

The school has become both a national and international model. In 1988, the school became a founding member of the 76 member National Consortium for Specialized Secondary School of Mathematics, Science and Technology. Recently, the Minister of Singapore visited the school. He was so impressed that ***he hopes to replicate a similar initiative in his country***. The NCSSM has become an international model because the faculty, administration and students have created a curriculum that ***integrates science, math and technology into practical applications*** and ***makes learning engaging and connects it to real world applications***.

In its report recommending the establishment of the North Carolina School of Science and Mathematics, the planning committee I commissioned wrote, "The most compelling reason for doing so is that ***creative excellence in science and mathematics is a worthy goal in itself***. The facts are, however, that ***excellence also underlies such practical needs as more and better jobs, better living conditions, development of new and abundant sources of energy and other advances*** – all of which are of great significance to North Carolina and the nation."

Let me remind you this was written ***nearly 30 years ago***. What could easily be viewed as foresight then, should be common sense now. North Carolina as a state, and we as a nation, ***face even greater challenges today***. For example, UNC System President Erskine Bowles recently said, "In the past four years, the UNC System has turned out only three physics teachers." It is imperative to cultivate creativity and excellence – ***particularly in science and mathematics*** – if we are to continue to be the world's economic leader. In addition to the School of Science and Mathematics, we have vigorously pursued opportunities to improve math and science achievement in North Carolina ***to promote economic prosperity***.

The ***North Carolina Mathematics and Science Network*** was established to strengthen the quality and size of the teaching base and the number of students that graduate from North Carolina high schools prepared to pursue careers requiring mathematics and science skills. The Network provides high-quality, professional development opportunities for teachers and recruits students to mathematics and science careers through pre-college program.

Another initiative, The ***North Carolina Board of Science and Technology***, encourages, promotes, and supports scientific engineering, and industrial research applications. The Board investigates new areas of emerging science and technology, conducts studies on the competitiveness of state industry, and works with the governor and the General Assembly to put

into place the infrastructure to support the next generation of North Carolina science and technology firms.

In addition, the ***North Carolina Science, Mathematics, and Technology Education Center***, endowed by the Burroughs-Wellcome Fund, was established to help North Carolina achieve a scientifically literate workforce and improve science and math instruction by fostering research based and comprehensive programs of instruction. The Center also supports educational initiatives and resources to ensure academic success in science, math and technology for all North Carolina students. ***The James B. Hunt, Jr. Institute for Educational Leadership and Policy***, which I chair, and the Center are currently involved in planning a Science Technology Engineering and Mathematics (STEM) Summit. This is our effort to bring together educators and key policy makers to help determine what next steps we need to take ***to not only catch up, but get ahead of the game***.

These initiatives are a good start to advancing science, math, and technology education progress. But I'm here to tell you ***we must do much more***. I believe that the recommendations set forth in Senate Bill 2198 are bold steps to support and advance innovation, creativity and entrepreneurship in our nation.

In order to achieve creative excellence in science and mathematics, ***it is necessary to recruit, retain and support teachers***. It is a well documented fact that the single most important element in a student's academic success ***is that student's teacher***. A 1999 study by the American Educational Research Association found that 27 percent of math teachers and 18 percent of science teachers ***were not certified in their field***. A similar study found that 45 percent of biology students, 61 percent of chemistry students and 63 percent of physics students from 1987 to 1999 ***were taught by teachers not holding a major or certification in that subject***. ***This is an injustice to our students – and our educational system***.

I strongly support Senate Bill 2198's recommendation to recruit and provide scholarships for 10,000 science and math teachers. I particularly support the provision to provide bonuses to participating teachers in underserved schools. ***We must invest in our teachers if we hope to improve the education progress of our students***.

Recruiting and retaining teachers is only the beginning. ***It is critical to provide teachers with professional development and enrichment opportunities***. I helped establish the National Board for Professional Teaching Standards for that very purpose. The goal is to advance the quality of teaching and learning by ***maintaining high standards***, ***providing certification for teachers who meet these standards***, and by ***capitalizing on the expertise of National Board Certified Teachers***.

The recommendation of Senate Bill 2198 to strengthen the training and education of 250,000 teachers is critical to provide teachers with the ongoing development they need to be successful. ***It is imperative that we start treating our teachers as professionals***. They have the responsibility to help shape the minds that will run our corporations and influence education policy of their own in the future. ***They are one of our nation's most vital resources***. **We should treat them that way.**

In addition to supporting K-12 education progress and teacher recruitment, retention and professional development, ***we must focus on enhancing our institutions of higher education***. I strongly support Senate Bill 2198 provisions to support and enhance institutions of higher education through increased scholarships, fellowships, federal tax credits, and visa processes.

American higher education has long been the envy of the world. For decades, students have come from across the globe in search of this education. Decades ago, they also stayed and contributed to our workforce. ***We can no longer depend on that***. Now, developing countries around the world are creating first-rate higher education systems. As a result, more students are choosing to stay and contribute at, or closer to, home.

All of these things are important. But, ***equally important is the education our students receive at our colleges and universities - especially our future teachers***. They must be prepared to take their place in our workforce to help America remain strong***. Their preparation – here in America – must be the best the world has to offer. It is our obligation to make sure that happens.***

Thank you for the opportunity to testify today on what has become, in my opinion, a national crisis of global proportions. I will be happy to answer your questions.

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