

U.S. House of Representatives

Committee on Science and Technology

Testimony by Tom Luce

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Mr. Chairman and Committee Members, thank you for the honor and the opportunity to testify before you today on the topic of innovation. I commend you on your leadership on this issue as well as your commitment to identifying best practices in business and education that will foster innovation, which is so essential to maintain our country's competitiveness in today's global economy.

Brainpower has always been key to American economic power – from the cotton gin to the telegraph...from the light bulb to synthetic fabrics...from miracle drugs to the microchip. We have surged ahead for the last two centuries on the strength of our education system.

But times have changed. Just 25 years ago, the U.S. led the world in high school and college graduation rates – today we have dropped to 14th in high school graduations and 15th in college graduations among industrialized countries.

Today U.S. students rank behind Canada, Japan and Western Europe in math and science – behind emerging Eastern European countries like Slovenia, Estonia and even tiny Liechtenstein.

What has happened?

Some of you may be tennis fans and followed the recent U.S. Open competition – for the first time since they've had rankings in that premier tennis championship, there was only one American in the quarter finals. Was that because American tennis players have gotten worse? No, it's because other countries have gotten better. The same thing applies to education -- we now face more competition from people in the former Soviet bloc and from people in the rising countries that used to be called Third World countries. We now are faced with billions of new competitors who are vying to beat us at our own economic game.

The warning signs are all around us: In the 1990s, the U.S. economy created around 2.2 million jobs a year. But from 2000 to the end of 2007, the rate dwindled to only 900,000 a year. Our growth engine is running out of fuel. Nearly 60 percent of U.S. Patents in information technology now originate in Asia. Only six of the top 30 companies in the world for solar power, wind power and battery development are American. Just as science and technology are fueling new growth around the world, the number of American engineers and scientists graduating has declined by 20 percent.

As one of my colleagues put it the other day, we are producing more science in the world today than ever before—but we are teaching less science in the U.S. than ever before.

We must do better. We believe the key ingredient to improving innovation – and stimulating high-value job creation -- in the U.S. is improving the math and science education our young people receive. If you think about it, almost every major innovation that we need to pursue as a nation – medical breakthroughs, economic growth, renewable energy sources, homeland safety and security or space exploration – requires the new standard of literacy in STEM fields: science, technology, engineering and math. As a result, we need a vastly increased pipeline of highly qualified math and science teachers and students who are excited about science, technology, engineering and math, to keep the U.S. from losing ground to its foreign competitors.

Two years ago, we established the National Math and Science Initiative to address this critical need. We identified specific programs with proven results that would directly and significantly improve math and science education in the U.S. We then leveraged the investment of both the public and private sectors to replicate the programs across the country. And we have already seen tremendous results.

The **Advanced Placement Training & Incentive Program** is based on a model that was initiated in Dallas more than 12 years ago. This program focuses on bringing more rigorous coursework to more students as well as increasing teacher effectiveness and student achievement. And we know it works.

Last year, we implemented this program in 67 high schools in six states, including Alabama, Arkansas, Connecticut, Kentucky, Massachusetts and Virginia. In just the first year, we have dramatically increased the number of public high school students enrolling in college-level courses, as well as those taking and passing AP exams in math, science and English.

- Our Year One data, which was released last month, demonstrated a 52 percent increase in AP exams passed in the 2008-2009 school year. *This is more than nine times the national average.*

Equally important, the results show that NMSI has helped close the achievement gap in math and science, particularly among under-represented students.

- For example, we recorded a 134 percent increase in AP math, science and English exams taken by African American and Hispanic students, in addition to a 72 percent increase in AP exams passed by these students.

We have essentially helped to eliminate the barriers to entry to rigorous coursework, which bodes well for American students. Passing AP exams is directly correlated with a significant increase college graduation rates.

The **UTeach** program is based on a model developed by the University of Texas at Austin. UTeach is an innovative teacher preparation program that transforms the way colleges and universities recruit, prepare and inspire new math and science teachers.

In the 2008-2009 school year, NMSI partnered with colleges and universities in 13 states to enroll more than 1,100 math and science undergraduate majors in the UTeach program. We anticipate that this first cohort of future math and science teachers will impact more than one million students over the course of their teaching careers.

In Texas, NMSI is proud to partner with and implement the UTeach program at the University of Texas at Dallas, the University of North Texas, the University of Texas at Tyler and University of Texas at Arlington. We know that this innovative program will produce outstanding math and science teachers who can transform education here in our own state and contribute to our region's and state's long-term economic growth and prosperity.

We believe this kind of public-private model that NMSI has put together is the way of the future. We are grateful to have corporate support for our work -- including Texas Instruments, Exxon Mobil Corporation and the Michael and Susan Dell Foundation -- and to have strong support from state agencies such as the Texas Education Agency and national organizations like the National Council on Teacher Quality. These public-private partnerships have allowed us to leverage limited resources to achieve incredible and sustainable gains in a short time.

Going forward, it will take continued collaboration and dedicated resources on a national level to multiply this success, and we commend federal legislators and policymakers on making STEM education a priority. The federal government has a leading role to play in turning the tide in STEM education in our country. You can fund educational programs with a proven record to create regional centers of excellence and innovation like we're working to build here in North Texas.

Taking proven educational programs and replicating them nationally will require a significant commitment. But we must be prepared to invest in the next generation. This is not a theoretical issue, it is about changing lives and giving the next generation the survival tools to compete in today's global marketplace.

You can't put a price tag on that. We must do what it takes to educate a modern workforce, keep our country competitive, and provide a quality of life for our children and their children.

NMSI is proud to be part of the solution by tapping into the unrealized math and science potential of our young people. With your leadership, we are confident we can equip our young people with the education they need, help our country work smarter and help America lead the way again in innovation.

Thank you for focusing on this urgent challenge, and I look forward to answering your questions.

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