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TO: Interested Clients

FR: Della Cronin

RE: Senate Subcommittee on Technology, Innovation and Competitiveness  
hearing on Fostering Innovation in Math and Science Education

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The Senate Commerce Committee's Subcommittee on Technology, Innovation, and Competitiveness held a hearing today on Fostering Innovation in Math and Science Education. The hearing's focus was the importance of science and mathematics education from kindergarten through graduate school in fueling future developments in the 21st Century's high-tech innovation economy.

Witnesses included Mary Ann Rankin from University of Texas's UTeach program; Paul Dugan, Superintendent of Nevada's Washoe County School District; Thomas N. McCausland, President and CEO of Siemens Medical Solutions USA, Inc.; and Ioannis Miaoulis, President and Director of the Museum of Science in Boston.

Senator John Ensign (R-NV), Chairman of the Subcommittee, opened the hearing by repeating what has been often heard on Capitol Hill: it is crucial that the US preserve its "long-standing history" of being the world's greatest innovator, and that federal support that "increases science and technology talent" in the US is prudent. Senator Ensign and Senator Joe Lieberman (D-CT) are cosponsors of the National Innovation Act of 2005 (S. 2109), another effort to address competitiveness issues, and Senator Ensign expressed his hope that the panel of witnesses would inform his efforts to pursue this proposal.

Senator John Sununu (R-NH) also offered some opening remarks, noting that he has an education in science and engineering himself. He asserted that he believes interest in engineering begins in grades 5-7, not secondary or postsecondary study, and "good teachers" are the most important element in cementing such interest. While discussing the factors that contribute to the competitiveness issue and improving math and science education, he conceded, "there are limited things we can do at the federal level." He praised the efforts of the National Science Foundation, however, joking that "we've [the Congress] have made every effort to mess

that up” and that the agency continues to thrive and produce good results. He also urged those at the hearing to make “best use” of programs that already exist and resist the urge to create new programs.

Dr. Rankin opened the panelists’ testimony. She asserted that “strong teachers” are the key to the competitiveness of the US in the future, but that the impetus for the creation of the UTeach program at University of Texas at Austin was the “frighteningly” short supply of them. After this year, UTeach will have produced 350 graduates—graduates who have both a degree in math or science and teaching, and have won both in four-year programs. She discussed some long-term results of the program as well, noting that retention in the teaching field for UTeach graduates is much higher than for new teachers generally; 75% of the graduates of the program from five or more years ago are still teaching. Dr. Rankin credits the success of the program to its aggressive recruiting within the university, the program’s flexible structure and the use of field experiences to give students real-life classroom experience. The program has been cited as a model program by the National Academies of the Sciences and is being replicated at other universities and in other states.

Mr. Dugan told the Subcommittee about his Reno, NV school district’s program dubbed, “The Gateway Curriculum” that will be implemented this academic year. It is a program that will require all students in high school to take four years of math, three years of science, and six subjects during their senior year. This program is based on the beliefs that: students must be exposed to rigorous and relevant coursework; it is imperative educators work to close the achievement gap between minority and at-risk students and their peers; all students should be prepared to go to college, even if they choose not to; too much remediation occurs at institutions of higher education; and, that all students must leave high school ready to work and ready to pursue postsecondary study.

Mr. McCauslan spoke about the importance of federal efforts to incent long-term research and development and inspire excellence in math and science education. He cited efforts of the business community, such as the Business Roundtable’s “Tapping America’s Potential” initiative and Seimans’ own efforts to get young people excited about math and science, which includes sending employees out to local schools to hold “Siemans Science Days” and providing scholarships to students. In addition, Siemans sponsors a national competition in math and science technology, along with seven universities and the College Board, which awards the winning team \$100,000 in college scholarships. Mr. McCauslan believes that public-private partnerships are important to sustainable change in this area.

Dr. Moualis spoke generally about science education—noting that young people learn about many scientific processes (photosynthesis, pollination, volcanic eruptions) in school, but are not exposed to practical applications of the study. This means that many students don’t know what engineers do, and are reticent to pursue engineering as a career choice. The Museum of Science in Boston is dedicated to a national effort to incorporate engineering into the school day curriculum. So far, they have productive partnerships in 25 states.

During the question and answer portion of the hearing, it was generally agreed that federal efforts and investments should focus on “faithful replication” of programs that have proven

results—such as the UTeach program. Further, the idea that math and science curriculum—at all levels—be rigorous and relevant was repeated.

During the question and answer period, Senator George Allen (R-VA) arrived and voiced his concern about getting minorities and women into STEM disciplines, asserting that “all Americans” need to be interested in and excited about these fields. He cited his legislative effort to give Historically Black Colleges and Universities and minority-serving institutions federal support to upgrade their technology infrastructure to this end.

Senator Ensign asked Moualis about the Museum’s involvement in afterschool programs, noting that many existing programs target low-income students—a population that federal competitiveness efforts need to reach. He also noted that museums are excellent sites for afterschool programs, as they provide an interesting environment and stimulating alternative to the regular school day. Moualis agreed, saying that museums often partner with organizations like 4-H and Boy and Girl Scouts to offer programs infused with science content. He did concede that professional development for afterschool program staff is a challenge. Senator Ensign encouraged Moualis to continue work in this area. Rankin built on this thread, asserting that UTeach often uses afterschool programs to provide the field experience that the program’s students find so valuable.

Senator Ensign thanked the panel for their insight and said he would continue to work on competitiveness issues this year.

The testimony of the panelists is available at <http://commerce.senate.gov/hearings/witnesslist.cfm?id=1784>.