

University of Northern Iowa

White Paper: Iowa Math and Science Education Partnership

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A recent report of the National Academy of Science warned of negative economic and societal consequences for our nation if downward trends in science and math education continue. According to the report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, 15 of the 20 fastest growing occupations in the 21st century will require substantial math and science preparation. Our national economy grows increasingly reliant on quality Science, Technology, Engineering and Education (STEM) programs at the very time when the performance of US students in math and science slips to all-time lows in comparison to youth of other developed nations. At the root of this decline is a shortage of math and science teachers. Most students of middle school math and science are taught by instructors lacking majors or certification in those fields. It will only get worse as some 200,000 math and science teachers are due to retire in the next decade.

Numerous public and privately funded initiatives have been launched to address this serious challenge. Governors of 27 US states have begun STEM education programs under the 2006-07 *Innovation America* initiative of the National Governors' Association. At the federal level, the America COMPETES Act (Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science) was signed into law in August of 2007, and now awaits appropriations approval.

In Iowa, our outlook mirrors the national condition and that of many other states. The three industry sectors of Iowa's new economy: bioscience, advanced manufacturing, and information solutions, require substantial mathematics and science preparation. Yet, Iowa eighth graders placed 18th among 50 states on the 2006 National Assessment of Educational Progress math exam. Only a quarter of our high school graduates take physics or a computer course. And, just 50 percent of Iowa ACT-tested students are on target to be ready for College Algebra, a gateway course for math and science majors. Further reflecting a national crisis, Iowa has a ten percent shortage of math and science teachers--173 vacancies unfilled last year in science, and 121 in math. And while laudably increasing rigor through additional math and science requirements for high school graduation, a 2006 state law will further strain schools' capacity for recruiting and retaining quality teachers in these disciplines. Even if every current science and math teaching major at all three Regent universities graduated and took positions in Iowa, the demand would not be met.

The Iowa Board of Regents recognized the challenge and established the Regents Mathematics & Science Education Collaborative Initiative (MSECI) in early 2007. President Benjamin Allen of the University of Northern Iowa was asked to lead this collaboration of all three Regent universities. The Initiative's three goals: 1) To improve mathematics and science performance of Iowa students; 2) To prepare more high quality mathematics and science teachers for Iowa's schools; and 3) Promote statewide collaboration and cooperation. An inter-university steering committee of faculty and administrators in math and science education-related fields used the consensus challenges identified by state education leaders to develop a proposal for FY 2009 funding by the Iowa legislature. This proposed plan targets four pressing needs: quality math and science teacher recruitment; invigoration of the secondary science and math curriculum; retention and update of practitioners; and the production of community college STEM instructors. These and other Regent university activities in STEM education are to be coordinated by an Institute at UNI. The committee has already begun to pursue federal and private resources to support efforts in setting the stage for state investment in science and mathematics education.