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September 2008 — News

STEM Report Calls for Refocus in Education

by Dave Nagel

A new report issued this week by the State Educational Technology Directors Association (SETDA) is calling for sweeping changes to bolster STEM education in the United States. Citing an impending shortfall in scientists, engineers, and mathematicians in this country, the report highlights the need to expose children to STEM early and to integrate these subjects throughout the curriculum, beginning as early as kindergarten.

The report, *STEM Education: Achievement and Innovation*, noted that while the fastest-growing segments of the U.S. job market require science and math skills, only 8 percent of the total number of degrees awarded in 2001 were in engineering, mathematics, or the physical sciences and that there's been a drop of 50 percent in undergraduate enrollments in computer sciences in the last five years. By 2010, should current trends continue, 90 percent of the world's scientists will be in Asia.

So given a consensus that the United States should lead the world--or at least compete with it--in science, technology, engineering, and math, the need to do something to turn around the current situation is critical. But, according to the report, there are significant near- and mid-term barriers to effect change--at the K-12 and higher education levels and in the culture as a whole.

In higher education, particularly in departments/schools/colleges of education, there is inadequate preparation for teachers and too little focus on STEM content understanding.

In K-12, high-quality STEM education is hindered by a number of factors, including a dearth of qualified teachers, lack of funding to promote STEM education, inadequate recruitment and retention policies, and certification issues for STEM-trained professionals who want to move into teaching, among many other issues. At present, the report said, only about 60 percent of educators teaching math in middle and high schools actually majored in math in college. And only about 33 percent of students in physical sciences are being taught by educators who majored in physical sciences themselves or who are certified to teach this subject.

Beyond education systems themselves, there are barriers to achieving meaningful STEM education for all students, including cultural perceptions on the part of parents and students that can hinder kids from becoming involved in science and math.

"The societal attitudes and perception of engineering, science, and mathematics careers must change at home and in school," said Mary Ann Wolf, executive director of SETDA, in a statement released this week. "The negative connotations of the 'computer geek,' 'brainiac scientist,' and 'mathlete' need to be

turned on its head. Parents, teachers, and community leaders must promote the possibilities of STEM careers instead of relegating these choices to 'other kids' who are really good at math or science."

So the report makes several recommendations for improving STEM education. Among these are:

- Obtaining "societal support" for STEM education;
- Exposing students to STEM careers;
- Providing ongoing STEM professional development;
- Proving STEM pre-service teacher training;
- Improving policies to recruit and retain STEM teachers; and
- Early exposure to STEM and integration of STEM subjects throughout the curriculum in every school, not just magnet or specialty schools.

"Strengthening STEM education should be for ALL students," SETDA's Wolf said. "While STEM programs offered through magnet or specialty schools often accessible to the 'cream of the crop' students are critical, we must do more for all students throughout their K-12 education experience."

The report highlights a variety of programs aimed at bolstering STEM education and also provides case studies of districts that have successfully implemented programs to improve one or more aspects of STEM education. A complete copy of the report can be found [here](#).

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