Shaping Tomorrow's Built Environment Today

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS EDUCATION

THE ISSUE

Strong education in science, technology, engineering and mathematics (STEM) to develop the future supply of technicians, engineers, and scientists is critical to our future standard of living. Even students pursuing non-STEM specialties need basic knowledge of scientific and technological applications for effective participation in the workforce, success in their personal lives, and responsible citizenship. The National Academy of Sciences (NAS) report, *Rising Above the Gathering Storm* (2007) expresses a "deep concern that the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength." Alarmingly, only about one-third of US fourth, and one-fourth of eighth graders perform at or above a "proficient" level in mathematics. Similarly, about one-fifth of fourth graders, and more than one-fourth of eighth graders lack the competence to perform even basic mathematical computations.[1]

ASHRAE's ROLE

As professionals focused on design, construction, operation, and maintenance of the nation's buildings and infrastructure, and as educators of future generations of engineers, ASHRAE members recognize the importance of a solid foundation in science, technology, engineering and mathematics. ASHRAE members are active in their local communities and in national programs, bringing exciting science and engineering programs to students. ASHRAE is actively engaged in the Solar Decathlon, National Engineers Week, STEM Education Coalition and other STEM education efforts in the US, and supports STEM worldwide through its Chapters and student activities programs.

ASHRAE's VIEW

Parents, educators, governments at all levels, and the private sector have important roles in ensuring that future generations possess the skills and critical competencies necessary to be successful in a highly competitive, global, and technologically sophisticated economy. We must work cooperatively to ensure that children receive the STEM training essential for future success. ASHRAE encourages policymakers to implement the following recommendations:

- Increase governmentally funded research to improve teaching and learning of STEM concepts and critical thinking skills.
- Recruit, train and retain qualified STEM teachers through the development of programs recognizing educators who excel in STEM education, and incentives that encourage the best and brightest scientists and engineers to teach.
- Foster partnerships among educational institutions, industry, and non-profit organizations and their members.
- Encourage the adoption of curriculum standards that cultivate high student performance; the development of curricula that foster creativity, experiential problem solving and critical thinking; and the development of assessments aligned with these standards and curricula.
- Create opportunities and incentives for women and minorities to pursue STEM coursework and careers.

[1] National Center for Education Statistics, "Trail Urban District Assessment: Mathematics 2011, Results at Grades 4 and 8". 2011. http://nces.ed.gov/nationsreportcard/pdf/dst2011/2012452.pdf.

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