

Improve Girls' and Women's Opportunities in Science, Technology, Engineering, and Mathematics

The American Association of University Women supports promoting and strengthening science, technology, engineering, and mathematics education, especially for girls and other underrepresented populations. The lack of women and girls pursuing such subjects has significant implications for women's economic security as well as the overall economy and America's global competitiveness. Fortunately, the U.S. has a significant pool of untapped talent. If women and members of other traditionally underrepresented groups joined the workforce in these professions in proportion to their representation in the overall labor force, the shortage of professionals in these fields would disappear.¹ AAUW supports the following efforts to improve girls' achievement in science, technology, engineering, and mathematics, and increase the number of women who choose these careers.

- **Use Title IX to Improve the Climate for Women in STEM Fields:** AAUW recommends requiring agencies to broadly and proactively conduct Title IX compliance reviews. Title IX of the Education Amendments of 1972 is the federal statute prohibiting sex-discrimination in education programs and activities that receive federal financial assistance. The law states, "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any educational program or activity receiving federal financial assistance."² To ensure compliance with the law, Title IX regulations require recipients of federal education funding to evaluate their current policies and practices, and adopt and publish grievance procedures and a policy against sex discrimination. Title IX does not require quotas or proportionality. Simply put, Title IX reviews ensure that women are not being discriminated against.
- **Measure Student Achievement in Science:** AAUW supports measuring student achievement in science. This will provide schools with necessary information on how well students are progressing and the improvements that still need to be made. The data gathered from such testing programs should always be disaggregated by sex, race and socioeconomic status and cross-tabulated. While testing is an important measure of success, high stakes testing should not be the sole indicator of student competency or a school's progress. Additional flexibility in Adequate Yearly Progress (AYP) measures required by the No Child Left Behind Act should be explored.
- **Improve Teacher Training:** AAUW supports efforts that train teachers to encourage girls and other underrepresented groups to pursue math and science careers. Teachers need to be trained on how to be sensitive to gender differences when teaching all subjects, especially science and mathematics. Teacher training would include ways to engage students in the face of gender-based peer pressure and parental expectations. This is particularly important because while studies show that all students start to lose interest in science and math by junior high, the loss is particularly steep for girls at puberty and likely results from gender-based social expectations and peer pressure.³
- **Enact Recommendations from *Beyond Bias and Barriers*:** The National Academies' report, *Beyond Bias and Barriers*, concludes that women face a lifetime of subtle biases that discourage them from careers in science and engineering. To overcome these challenges and to expand women's participation in such occupations, AAUW supports enactment of the report's recommendations, which would require agencies that fund scientific research to conduct anti-gender bias workshops, enforce existing federal anti-discrimination laws, publish demographic and funding data for grant applications, and extend grant support for researchers on care-giving leave. AAUW strongly supports the report's recommendation that colleges form an NCAA-like inter-institutional monitoring organization that shares data, evaluates progress, and uses Title IX and other civil rights laws to eliminate gender bias in faculty recruitment, retention, and promotion in these fields.
- **Ask For a Report Responding to *Rising Above the Gathering Storm*:** The report, commissioned by Congress from the National Academies on Science, Engineering and Medicine and published in 2007, states that the United States' advantages in science and technology are eroding and discusses the need to improve math and science education. Unfortunately, the report largely ignores the issue of women and underrepresented minorities in science, technology, engineering, and math. AAUW recommends that Congress request a more specific follow-up study on methods to increase the number of women in these fields and the effect this would have on U.S. leadership in the global marketplace.

- Encourage the Inclusion of Science, Technology, Engineering, and Mathematics Subjects and Activities in Co-curricular Programs:** Incorporating these subjects and activities in after-school and summer programs enables students to explore the field in a supportive atmosphere and enhances student interest in these careers. Research suggests that information about the usefulness of engineering to everyday human concerns and hands-on experiences with science, math, and technology may help girls develop an interest in these fields.⁴ The need for co-curricular activities in these topics is addressed in the America COMPETES Act through experiential summer internships for middle and high school students at the National Laboratories, as well as summer term education programs to prevent learning loss between school years.
- Strengthen Academic Preparation for Science, Technology, Engineering, & Mathematics Postsecondary Study and Careers:** The need for qualified professionals in these fields continues to grow, making it critical to ensure that students are receiving adequate preparation to pursue careers in these high-demand fields. Through the America COMPETES Act, a pilot program will be launched to support the development of comprehensive secondary schools for science and mathematics education. Other important initiatives in this law include expanded access to Advanced Placement and International Baccalaureate classes and the alignment of secondary and postsecondary education systems. AAUW is also supportive of SMART grants, which will further women's interest and participation in the science, technology, engineering, and mathematics fields. These grants are awarded to students pursuing a degree within these topics who are in the third or fourth year of the academic program and have maintained a minimum 3.0 grade point average.⁵
- Emphasize Science and Mathematics in Early Education, Not Just High School:** Studies show that students begin to lose interest in science, technology, engineering, and math by junior high school; this is particularly true for girls.⁶ Teaching children about science and mathematics in elementary and middle school is critical to not only improving subject matter competency but also sparking and maintaining girls' interest in the field. AAUW supports the creation of common core standards that cover science and mathematics for kindergarten through grade 12 and reflect the knowledge students need to enter college or the workforce and compete in the global economy. The America COMPETES Act directs the National Academy of Sciences to convene an expert panel to identify promising practices and critical skills in the teaching and learning of these topics; their work may be helpful in developing these standards.

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¹ Congressional Commission on the Advancement of Women and Minorities in Science, Engineering and Technology Development. (2000). *Land of Plenty: Diversity as America's Competitive Edge in Science, Engineering and Technology*. Retrieved April 8, 2009, from http://www.nsf.gov/pubs/2000/cawmset0409/cawmset_0409.pdf.

² Title IX of the Education Amendments of 1972, 20 U.S.C. § 1681-1688 (1972). Retrieved January 6, 2009, from <http://www.usdoj.gov/crt/cor/coord/titleixstat.htm>.

³ Congressional Commission on the Advancement of Women and Minorities in Science, Engineering and Technology Development. (2000). *Land of Plenty Diversity as America's Competitive Edge in Science, Engineering and Technology*. Retrieved on December 29, 2008, from http://www.nsf.gov/pubs/2000/cawmset0409/cawmset_0409.pdf.

⁴ Jozefowicz, D. M., B. L. Barber, et al. (1993). Adolescent Work-Related Values and Beliefs: Gender Differences and Relation to Occupational Aspirations. *Biennial Meeting of the Society for Research on Child Development*. New Orleans, LA: 1-22. And Fancsali, Cheri. *What We Know About Girls, STEM and Afterschool Programs*. Retrieved December 29, 2008, from http://gsg.afterschool.org/images/public/Resources/We_Know_About.pdf.

⁵ U.S. Department of Education (2008). *The National Science and Mathematics Access to Retain Talent Grant (National SMART Grant)*. Retrieved December 29, 2008, from <http://studentaid.ed.gov/PORTALSWebApp/students/english/SmartGrants.jsp>.

⁶ Congressional Commission on the Advancement of Women and Minorities in Science, Engineering and Technology Development. (2000). *Land of Plenty Diversity as America's Competitive Edge in Science, Engineering and Technology*. Retrieved on December 29, 2008, from http://www.nsf.gov/pubs/2000/cawmset0409/cawmset_0409.pdf.