

Women and Girls in STEM

Addressing Critical Equity Issues

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Women and girls, and particularly those of color, are significantly underrepresented in fields requiring preparation in science, technology, engineering and math (STEM). They remain invisible in STEM post-secondary courses and professions. Girls who do major in science tend to major in life sciences. For example, 59% of all bachelor's, master's, and doctorates in biology are awarded to women as compared to only 19-20% of the similar degrees in engineering and computer science; except for medical students, salary and job prospects are lower in biology and research ([“Where the Women Are: Biology,”](#) The New York Times, Nov. 4, 2011). The figures for minority women are even more striking. Only 19% of all biology degrees are awarded to minority women, and only 5-7% of all engineer or computer science degrees are awarded to minority women. (Digest of Education Statistics 2010, NCES 2011-015 U.S. Dept. of Education, April 2011). Since the differences in course-taking patterns and performance at the secondary level reflect only minor differences between males and females, what could be at fault? According to the *Institute of Education Sciences Practice Guide, Encouraging Girls in*

Mathematics and Science, consistent gender differences appear in three areas: “children’s and adolescents’ beliefs about their abilities in math and science, their interest in math and science, and their perceptions of the importance of math and science for their futures.”

The solution requires not just providing classes and enrolling students, it also demands the best of teachers who are highly knowledgeable about content as well as skilled in instructional methodologies, especially those that have a positive impact on females. For example, teachers must help girls to believe that their abilities in mathematics and science can be improved, expose girls to female STEM role models, and provide girls with activities that spark their curiosity and interest in mathematics and science. With the low graduation and proficiency rates for students of color, it is inevitable that minority females will remain underrepresented in STEM if we don’t take those actions that are most likely to have a positive impact on their interest in STEM and their belief that they can be successful in a science, technology, engineering, or mathematics field.

PROMISING PRACTICES

- **Evidence-Based Practices**
Doing What Works Clearinghouse (with evidence of positive or potentially positive effects for improved outcomes for students in mathematics and science)
- **Programs**
The COMPUGIRLS program is a two-year curriculum using multimedia activities as a means of encouraging computational thinking. The project advances understanding of how to encourage girls (including girls from underrepresented groups) to pursue Information and Communication Technology ICT fields. It builds upon established research and includes evaluation of the impact on participants' computational thinking, techno-social analytical skills, attitudes about and interest in pursuing further education and careers in ICT/STEM fields.
- Making Middle School Mathematics Accessible to All Students (MAS) is a WestEd professional development opportunity designed to enhance the capacity of middle school mathematics teachers, teacher-leaders, special education teachers, and paraeducators (instructional aides) to support all students to achieve mathematics proficiency.

PUBLICATIONS

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- Richard A. Duschl, Heidi A. Schweingruber, and Andrew W. Shouse, Editors (2011). Taking Science to School. Learning and Teaching Science in Grades K-8. Washington, D.C.: National Academies Press.