

Why Are Females Underrepresented in Science, Technology, Engineering, and Mathematics Careers?

By Barbara A. Dunham

While females appear to be more interested in science, technology, engineering, and mathematics (STEM) recently, there is still an underrepresentation in these fields regarding leadership opportunities. The question is: How do we raise awareness among females of the enormous growth opportunities regarding these professions? Prior research has shown that females may be less likely to pursue careers in science and math because they appear to be equally skilled in other areas of study. Although more females are performing well in science, technology, engineering, and mathematics courses, they are still less likely to pursue STEM careers than males.

Females with high verbal scores tend to select careers that are not associated with STEM because they have not been introduced or exposed to these types of careers. Few schools properly integrate technologies and sciences and this leaves little time for the instructors teaching these courses to collaborate. When collaboration does occur, it is generally a humanities instructor attempting to include aspects of STEM within a course. However, the recent adoption of the [Common Core Standards](#) by 45 states requires more integration among subjects taught in K-12 schools (Perry, 2013). To properly implement and imbed STEM within all courses taught, we must begin with elementary and middle schools. Educators must introduce STEM to students as early as possible.

Many educators already are performing these tasks, but without adequate explanation. Prior research has shown that students who are engaged with project-based learning activities are more likely to have an interest in STEM. Therefore, they become interested in pursuing these types of careers. Although students may change their minds numerous times regarding their career choices prior to graduating high school, they must be afforded the opportunities to make informed choices. All stakeholders must take an active role in informing students of the opportunities available to them. This can be achieved by hosting career fairs, assigning career projects where they must research specific career choices, problem-based learning, and assigning hands-on projects.

Students can further be exposed to STEM careers through participating with summer educational programs. The [Army Educational Outreach Program](#) Huntsville, Alabama offers students various opportunities to interact with engineers. They are given various tasks that lead to an understanding of tasks performed by engineers on a daily basis. The [Gains in the Education of Mathematics and Science Program \(GEMS\) Aviation and Missile Research, Development, and Engineering Center \(ARMDEC\)](#) is a summer program for students in 8th to

12th grades who will spend one week, typically in June or July, developing critical thought processes and conducting experiments illustrating basic scientific principles. The goal of the GEMS program is to broaden the interest in science, engineering, and mathematics, GEMS is led by a certified high school instructor and three “[Near Peer Mentor](#)” college students. After a student has completed an initial GEMS program, referred to as GEMS-1, a subsequent GEMS-2 program is available in which students explore science, engineering, and mathematics in greater depth and detail. GEMS participants have gone on to additional programs at Redstone Arsenal including the [Science and Engineering Apprentice Program \(SEAP\)](#), and the Pathways Program. GEMS-1 students at AMRDEC explored the principles of electronics and mechanics via experiments with robotics, rockets, steam engines, and non-Newtonian fluids. Electronic concepts were investigated via the development of solar- and hydrogen-powered cars, crystal radios, and MacGyver household batteries. Students also researched optics and acoustics by building telescopes, microscopes, spectrometers, and music boxes. GEMS-2 students researched electronics, aerodynamics and mechanics by constructing personal computers, hovercrafts, wind tunnels, model airplanes, planetariums, and [Rube Goldberg](#) machines.

GEMS is part of the Army Educational Outreach Program (AEOP), which consists of Army-sponsored research, education, competitions, internships, and practical experiences designed to engage, guide students, and teachers.

These types of programs are essential in assisting students with making career choices that are appropriate for them.

References:

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Perry, M. (2013, March). [Association for Psychological Science](#), 95 (4), 12-18.

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