

Increasing Female Adolescents' Interest in STEM Subjects

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Adolescent girls are less likely to pursue academic studies in science, math and technical subjects (Chen et al., 2011). The lack of interest has resulted in the underrepresentation of women in the science, technology, engineering and math (STEM) careers (Turner, 2011). Factors such as low self-esteem, gender bias, and society expectations negatively impact female enrollment in technical, scientific and engineering programs. Parental encouragement and support of community and educational programs which provide exposure to math, science, engineering and other technical fields will improve the gender disparities in the STEM vocations.

Discussion

Adolescence is the transitional period between childhood and adulthood during which youth are learning to navigate the world, discovering who they are, and learning their place in society (Witt & Caldwell, 2005). Adolescent girls face unique challenges as a result of biological differences as well as cultural and society expectations. Negative stereotypes regarding women's technical capabilities are transmitted by parents and teachers (Shapiro & Williams, 2012). Elementary school girls are enthusiastic about math and science. However their attitude toward such subjects changes during the middle school years. For middle school girls, the "negative effects of gender stereotypes results in fewer girls than boys taking courses in math, science and technology and fewer girls exploring alternative careers, particularly STEM careers" (Turner, 2012 p.1). A 2011 research study (Deacon, 2011) indicated that classroom environments exist which inhibit math interest and performance for adolescent girls. Girls are also pressured by their peers

to steer away from non-required math and science classes. The disinterest that originates in middle school is often carried into adulthood(Turner, 2012).

It is projected that the United States will experience a shortage of professionals in the science, technology, engineering and math (STEM) fields in the upcoming years (Medeiros, 2011). Our country can benefit from the diversity and talent that women can contribute to the STEM fields. A 2012 (*Economic Week*) Girl Scout report stated “74% of teen girls are interested in STEM subjects...but few girls consider it their number-one career option.” The article also indicated that girls did not understand how STEM careers correlated to their desire to help people. In recognition of the gender gap, the White House Council on Women and Girls hosted a White House event on April 24, 2012, that featured a panel of trailblazing women in STEM fields. These women shared their experiences and encouraged girls to follow in their footsteps. (*Economic Week*, 2012)

Parental involvement plays a critical role in the growth and academic progress of children (Kumar, 2011). To encourage the advancement of females in STEM areas, parents must contribute their time, energy and resources. Parents have to foster the desire to matriculate in math and science at a young age. Parental involvement is also needed to encourage STEM class selection and academic performance. Kumar noted the correlation between high course achievement and parental support. In addition, family involvement in STEM related community programs will motivate girls to pursue careers in math, engineering and technological industries. Organizations such as Girls Scouts of America, operate to build courage and confidence and empower girls to operate at their full potential (<http://www.girlscouts.org/>). Duke and other universities around the country

offer after-school programs and summer camps that inspire girls in science, math and engineering. The National Girls Collaborative (www.ngcproject.org) is a national organization that encourages girls to pursue careers in the STEM areas. The American Association of University Women (AAUW) is another national organization that works to empower women and girls through advocacy, education, philanthropy and research (www.aauw.org).

Suggestions

Parents should utilize several venues to increase STEM awareness by providing exposure, encouragement and support. Listed below are suggestions for stimulating STEM interest:

- Tour local science museums.
- Attend local math, science and technical exhibits and expositions.
- Applaud academic performance in math and science courses.
- Work closely with local school administration to ensure promotion of female involvement in STEM courses.
- Encourage enrollment in advance science, math and technical courses in high school.
- Participate in community organizations such as the Girls Scouts.
- Participate in national organizations such as the National Girl Collaboration and the AAUW.
- Encourage participation in school science and math fairs and competitions.
- Participate in after-school community science and math programs.
- Participate in summer camp community science and math programs.
- Request technical engineering and math publications.

Listed below are programs that parents can sponsor to stimulate female interest in STEM subjects:

- Sponsor community science and math fairs
- Sponsor and facilitate community math and science games and activities.
- Request local math and engineering female professionals to conduct workshops.
- Sponsor group tours of engineering and math programs at local colleges and universities.

It is projected that by 2018, the majority of the fastest growing occupations will require at least a bachelor's degree in science or math (Stratton, 2011). It is essential that adolescent girls receive exposure to STEM fields to broaden their future opportunities. Parents can collaborate with educators and community youth professionals to promote healthy female development that will ensure comprehension of future required vocational skills.

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