**Ways K–12 Educators Can Empower Girls to Consider STEM**

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Expert Viewpoint

**5 Ways K–12 Educators Can Empower Girls to Consider STEM**

* By Jen Ramage
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Women hold [**just 28 percent of jobs**](https://www.aauw.org/resources/research/the-stem-gap/) in STEM fields in the U.S., according to the American Association of University Women. This disparity contributes to the wage gap and a variety of other inequalities, and the disparity starts long before women get to college.

Among K–12 students, a recent [**national study by YouScience**](https://thejournal.com/articles/2022/03/14/youscience-report-shows-vast-gap-between-stem-aptitude-and-interests-of-female-students.aspx) uncovered a significant career exposure gap for female students, as their aptitude scores for STEM-related occupations far outweighed their self-defined interest in them. In fact, the research showed that female high school students demonstrated 10 times more aptitude than interest in some STEM career fields like architecture and engineering.

When girls with the natural aptitude and promising academic achievements are not encouraged to explore STEM careers, we miss out on the potential contributions and ideas they could bring to those fields. STEM careers can also open doors economically for these students as they enter the workforce. According to The Brookings Institute, 14 of the 16 fastest-growing future industries are in STEM, and “[**all of the top 25 degrees by pay and demand are in the STEM subjects**](https://www.brookings.edu/blog/brown-center-chalkboard/2022/03/23/rising-to-the-challenge-of-providing-all-students-with-high-quality-stem-education/).”

K–12 educators play a crucial role in shaping what future careers young women will explore and consider. During my own experiences in STEM education — as both an advocate working at DigitalEd to improve STEM learning experiences at more than 300 colleges and universities around the world, and as a K–12 student myself in both Canada and the United States — I’ve gotten very different messages about women and STEM, depending on the school in question.

These experiences have highlighted educator messaging that works — and what doesn’t work — to encourage girls to pursue STEM education and explore STEM career fields before they get to college. Following are five ways that K–12 educators can inspire and empower girls in STEM:

**1. Consider the Messages Girls Are Receiving About Women as Caregivers**

As a high school student, I received very different messages about my career possibilities and my role in society in Canada than I did when I moved to a rural U.S. school in 10th grade.

At the first school, I heard and understood that women could be anything they wanted to be; I was exposed to STEM careers and encouraged to consider those fields as possible for myself. In contrast, when I moved to a small, rural U.S. school, I got the message that, first and foremost, women were to become caregivers. That message was shared with me formally through the class discussions on topics like home economics, and informally when I looked around at the paths of women and girls in the community. When women are taught that caregiving is their ultimate responsibility, it can feel like a heavy burden.

Messages that caregiving is “women’s work” prevent girls from aspiring to enter STEM fields, and it can lead to some women dropping out of the STEM workforce when the responsibilities of unequal parenting are too much to balance with challenging careers.

Educators must consider the messages they may be imparting to young girls, consciously or not, about the expectations society has for them as they grow older.

**2. Start Early and Get Young Girls Involved in Fun, Hands-On STEM Programs**

Some of the best programs that I’ve seen in our country to get girls interested in STEM start in kindergarten, or even earlier, by combining play and STEM. Getting students to play with puzzles, Legos or blocks to learn basic concepts or having them do fun hands-on experiments is a great way to get them excited about science, technology, engineering, and math.

Before children develop negative opinions about STEM — as in, STEM topics are “too hard” or “that they aren’t good at them” — allow girls and boys to sample those subjects through low-stakes activities where they’re not graded. Math and science enrichment should be about having fun and getting students to think about these topics as interesting and exciting.

**3. Connect Female Students with Role Models and Mentors**

Seeing women working in STEM fields and leading math and science programs is way more powerful than anything you could tell a girl about who or what she can become.

These role models and mentors might be teachers in the district, but they also could be community members or guest speakers. Consider the women in your community who are making an impact in fields like engineering, environmental science, healthcare, or technology — and then consider how you might recognize and celebrate their achievements, while helping students learn about what they’re doing.

If guest speakers aren’t available, a teacher can make a difference in girls’ futures by something as simple as sharing the accomplishments of women making the news in STEM roles, creating a bulletin board to draw attention to female leaders in STEM fields, or doing a class project on the lives of women who changed STEM fields.

Representation matters, and when young girls see women who have “made it” in these fields, they begin to believe that they can, too.

**4. Share Information on Different STEM Careers and Paths**

Children do not pursue subjects that they don’t know are options. Girls need to learn about the variety of STEM careers and the paths they might take to pursue those careers.

Take time to make sure girls know about career opportunities and the ways that the topics they’re learning about in school could apply to those careers. Explore some of the growing career options in STEM. If they’re learning about math in school or taking a course on computers, take some time to share how those topics apply to current and emerging career opportunities in STEM such as architectural engineering, computer coding, and advanced manufacturing.

Recognize awareness “holidays” throughout the year such as International Day of Women and Girls in Science on Feb. 11, Women’s History Month in March, and International Women in Engineering Day on June 23.

Also, provide resources where students interested in learning about STEM fields can learn more about them independently. [**Many colleges and universities**](https://engineering.temple.edu/academics/degree-programs/k-12-stem-summer-enrichment-programs) offer STEM enrichment programs for K–12 students [**during the summer**](https://blackrocket.com/online/dvu/); these programs can help fuel an interest in these subjects. For students with an interest in coding, [**summer coding camp programs**](https://www.idtech.com/girls) can also be a fun way to offer encouragement.

**5. Educate Girls About Scholarships and Financial Aid for STEM Programs**

I didn’t have the money to pay for college. Scholarships made my education possible, and I only learned about those scholarships because I asked. But how many students out there are like I was and either they don’t have the courage to ask, or the they don’t know to ask about scholarships?

A big mistake schools make is assuming that students know about financial support or that they’ll reach out to ask questions if they need support.

Whether it’s a STEM-related summer camp, a field trip, or a college scholarship for a promising high school girl, educators can help students by proactively reaching out to let them know about financial aid, no-cost enrichment programs, or other forms of support. The more outreach educators can do to reach students to make sure they all know about the opportunities available, the more opportunities open up for young girls and boys, no matter their socio-economic status. Make sure a girl isn’t losing out on an opportunity because she can’t afford to participate and doesn’t know about financial support.

**Questions K–12 Educators Should Consider**

* What messages are we giving girls about women’s roles in society in school?
* How are our school programs, activities or curriculum materials reinforcing or challenging gender stereotypes surrounding STEM?
* Is my district proactively reaching out to students to let them know about available STEM enrichment activities and programs? How are we making these programs available to all students?
* How are our high school students being made aware of STEM scholarships for higher education?
* What are we doing to show our students local or nationally-recognized female role models in STEM? How can we incorporate them into our curriculum?

K–12 educators can play a powerful role in closing the U.S. STEM gap for women. Students need opportunities for fun, hands-on STEM lessons early in their K–12 experiences; exposure to role models and mentors; and support to pursue STEM enrichment programs. Educators can get girls involved in learning about STEM through a variety of available online resources, in-school programs, activities, and speakers.

What’s just as important as all those learning opportunities are the messages that girls are receiving in school about who they are, how they fit into the world, and their potential to make an impact in any field they choose to pursue.

**About the Author**

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