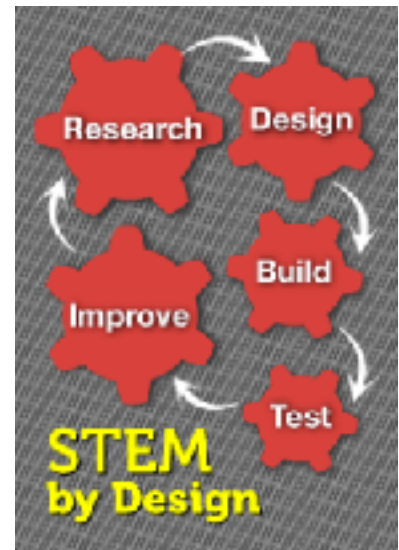


Laura Reasoner Jones and Anne Jolly

STEM: Where Are the Girls?

middleweb.com/16899/stem-girls/

In the last few years STEM has literally exploded across our national, regional, and local scenes, both in our education and workforce areas. A Georgetown University study reveals that occupations in STEM fields are the second fastest growing in the nation. (Health occupations are first.) This raises the obvious question: Are we producing enough STEM workers to staff the workforce of expanding STEM industries? You probably know the answer – No. Check out the numbers: The National Science Foundation estimates that about five million people now work directly in STEM fields – just over 4 percent of our workforce. Think about how much of our economic innovation and productivity depends on that small percentage of workers.



Our nation will have more than 8.6 million STEM-related jobs available in 2018, and three million of those jobs may be unfilled – or at least unfilled with American citizens. The National Math and Science Initiative points out that we already rely heavily on foreign-born workers to fill the leaks in our STEM pipeline.

Women can fill that gap

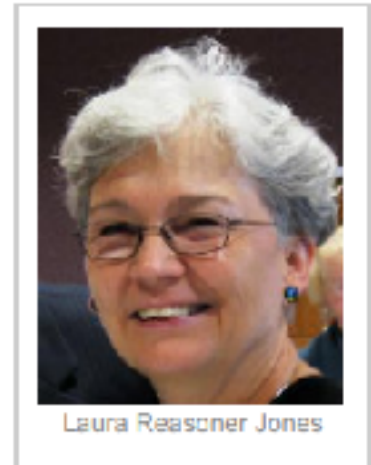
Currently our K-12 students are talented enough in math and science to fill our rapidly growing need for STEM workers. However, more than 75% of those talented students do not enter STEM majors in college. Where will our nation get the workers to meet the needs of the STEM workforce? Here's an idea: What about recruiting, educating, and employing women? Keep in mind that I'm not making this suggestion from a "poor persecuted girls" mentality. Frankly, this is a clear-cut issue of finding enough home-grown talent to meet our STEM needs.

Girls are smart, creative and talented – they have the right stuff for STEM careers. So where are they? It's still a front-burner issue – women in STEM; or, more to the point, the lack of women in STEM fields.

Veteran teacher Laura Reasoner Jones, founder and director the GEMS Club (Girls Excelling in Math and Science), points out that our daughters are missing out on exciting, challenging careers with opportunities for high salaries and long-

term growth potential. And the world at large is missing out on the innovative ideas and contributions of millions of women who have the dispositions we associate with STEM-related work.

Even if women don't go into STEM, they need a foundation of STEM knowledge and practices to participate in a healthy 21st century democracy. We need to fix this problem, but before we can come up with a solution, we need to answer an important question: Why aren't there more girls or women in STEM courses and fields? In other words, what's the problem?



One way you can build your girls' leadership skills is to combat the victim mentality that may appear when they become aware that females have been treated unfairly.

When working with your girls, don't dwell on women's struggles in the workplace in ways that build resentment. Empower your girls with understanding of their own skills, strengths, and opportunities. Give them opportunities for problem-solving, teamwork, and critical thinking so that they can make the right career choices for themselves.

What's the problem with girls, women and STEM?

To get some expert insight, I tapped into the knowledge of a new virtual acquaintance, Blair Blackwell, who manages corporate education programs for Chevron, and whom I plan to quote liberally in this post. Blair focuses on increasing the quality of and access to STEM education, especially for girls, so I asked her: Do women actually want to go into STEM fields? And, if so, what's stopping them?

Blair identified three obstacles detrimental to bridging the gender gap:

1. A lack of fellow girls and young women in STEM classes. According to Blair, the

problem is fundamentally one of sustained interest. The lack of women already in the career pipeline is really to blame here. It's challenging for women to pursue a professional path where they are very clearly lacking in numbers. Many young women leave STEM degree programs despite their good academic standing, often citing uncomfortable classroom experiences and a climate where they feel isolated.

2. The lack of role models and mentors. Ongoing encouragement and support is critical. It's one thing to get children interested; it's another to assist them through their educational career to ensure that each young woman has the champions she needs to succeed in STEM should she desire to do so.

3. Societal stereotypes. I wondered if girls would be more interested in STEM pursuits if they involved challenges such as home architecture, toy design, formulating makeup, etc.

Blair responded thoughtfully, While I'm a proponent of getting students involved in STEM through a multitude of means, I don't think we need to pigeonhole women into historically female oriented fields to spark interest. Blair's opinion has a lot of support. A recent article from SFGate asserts that making STEM challenges too "girly" may push girls away. Typical engineering issues of everyday life are equally appealing to girls – especially challenges that involve making the world a better place. Reminding girls of stereotypes using phrases like "pink tech" and "web diva" is not the way to engage them enthusiastically in STEM careers, suggests Elizabeth Losh, a digital culture scholar at UC San Diego.

Nisha Cooch

Neuroscientist Nisha Cooch offers yet another perspective. She suggests that the difference in numbers of women in STEM jobs may result from both biological and cultural influences. As infants, girls focus on faces while boys focus on mechanical objects. Females and males also show different neural activation patterns during performance of cognitive tasks on which they perform equally well. Thus, Cooch says, girls and boys process information and learn in different ways, and their academic performance and choices may differ based



on how they are taught. While women and men have comparable abilities in STEM subjects, biology may partly explain the difference in their tendencies to choose careers in STEM and in what sorts of STEM careers might be of most interest.



Involve girls in spatial skills training. There does seem to be a gender gap in spatial skills needed for performance in math and science. However, research shows that this is a relatively easy gap to close.

How do we solve the problem and engage girls in STEM?

Build interest in STEM subjects from a young age. Blair suggests immersing girls in interesting STEM projects and allowing them to design, prototype, and physically create anything they want using tools like laser cutters and 3-D

printers. Give them opportunities to use their creativity and practice problem solving

– two elements of STEM that particularly appeal to girls. She points out the importance of opening girls’ eyes to just how exciting these fields can be and instilling that initial interest in them at a young age.

- Create a classroom that sparks curiosity and fosters long-term interest in STEM. Students often over digging into STEM adventures, explorations, and challenges. Not all girls (or boys) like focusing on



machinery, however. Be sure to include real life challenges in other areas such as health, life sciences,

environmental challenges, forensics, and so on. Most importantly, use inquiry, inquiry, and more inquiry – combined with a search for solutions to real problems – as your basic teaching/learning approach. Maintain the “fun factor” as an avenue to learning.

Support girls and women through mentors and role models.

Sustained mentorship efforts help to achieve the goal of getting women to pursue careers in STEM. Young women also need female role models who currently working in STEM jobs, taking STEM courses, and becoming STEM leaders. Blair points out that these female mentors must be available and active in attracting and retaining women in academics and business, especially in the historically male dominated STEM fields. As an example, women employees of Chevron partner with Techbridge to serve as role models and mentors, giving lessons on geology and computer science and encouraging young women to study science and engineering.

Engage the support of men.

I did a double-take when I saw the title of this Washington Post article. One key to having more women in STEM is . . . wait for it . . . men! According to the author, James LaPlaine, more men need to step up to the plate and create a culture of inclusion for women – a climate where sexism, dismissiveness and gender prejudices are not tolerated. He sees this as both common sense and a necessity. Men like LaPlaine, who supports a GEMS Club initiative – certainly can be influential in making this a reality.

What can YOU do about girls and STEM?

The answer to this would fill a book. However, I'll point out three quick ideas. Laura Reasoner Jones developed a "[GEMS CLUB Toolkit](#)" that gives you everything you need to start and run your own GEMS club for school-age girls ages 8 to 13. Chevron partnered with Techbridge to produce a guide, [Science: It's a Family Affair](#), to help parents engage children in engineering experiences.

You'll find 10 excellent suggestions on pages 29 and 30 of the Girl Scouts' Generation STEM: What Girls Say about Science Technology, Engineering, and Math. http://www.girlscouts.org/research/pdf/generation_stem_full_report.pdf

If you simply go online and type "girls and STEM," you'll encounter plenty of resources to explore. Maybe you'll catch the "more girls in STEM" bug and create some initiatives of your own!