



## **Engineering a Change**

*By Thea Sahr, associate director of educational outreach, Boston's WGBH public broadcasting channel*

Imagine you're thinking about buying your first home. On a neighborhood drive, you pass a house that attracts your attention. You call the number on the for sale sign, and the real estate agent says, "The house needs a lot of repair. You'll be working on it every night and weekend. The rooms are small. It's overpriced. There's no convenient public transportation," and so on and so on.

Would you make an appointment to see that house? It's unlikely.

Now imagine this scenario: You're a high school student thinking about studying engineering. You decide to talk to the one engineer you vaguely know, and he tells you, "You have to excel in math and science. The course work is really hard. Maybe some of the toughest the school offers. You'll be studying all the time. It's really tough going."

Would you choose engineering as your college major? Only if you're a glutton for punishment.

The first scenario was entirely fiction. It's hard to imagine a real estate agent that would market a house like that. The second scenario, sadly, occurs day after day, in every corner of this nation.

Let's be clear: It's important that engineers have a solid background in math and science, but ultimately, the best engineers are people who use their communication skills, imagination and analytical abilities to invent, design and create things that matter.

## **Getting girls involved**

Engineering has been a focus of Boston's WGBH's programming and services for many years through programs such as Nova, Building Big and Design Squad, and their educational outreach initiatives. Not long ago, the station joined a coalition of engineering associations, corporations and universities to investigate why high school girls aren't choosing to study engineering. The existing data told us young women take math and science courses at the same rate or higher as boys, and they perform as well as or better than their male peers. Yet, very few choose to pursue engineering majors. Why?

To find out, we conducted a study and asked academically prepared high school girls what they think about engineering. The results were disheartening—they called it a "man's job" that centered on science and math and said it "just wasn't for them." Simply put, engineering has a serious perception problem.

In this same study, we also explored what girls are looking for in a career and found that personal relevance is key. Girls want collaborative and creative careers that make a difference in the world. They are looking for interesting, enjoyable, flexible jobs in good working environments. While these characteristics are in fact an integral part of engineering, they aren't the ones that engineers, teachers and guidance counselors have been highlighting.

This research informed two initiatives: Design Squad, a reality television series for middle-school students that focuses on engineering; and Engineer Your Life (EYL), an awareness campaign and website ([www.engineeryourlife.org](http://www.engineeryourlife.org)) designed to realign engineering with the interests and career goals of high school girls.

The goal of EYL is straightforward—to replace the old messages that centered on the difficult process of becoming an engineer with new messages that highlight how creative, collaborative, lucrative and flexible an engineering career can be.

Can we inspire a new generation of engineers? Yes, we can. But it requires an army of ambassadors prepared to convey the new messages. By promoting a positive view of



engineering, you can profoundly influence the directions your students will consider and the kinds of contributions they will make in shaping the future.

### **Set out to learn more**

We implore every teacher and counselor to visit [www.engineeryourlife.org](http://www.engineeryourlife.org). Visit the “For Counselors and Parents” section to learn about these new messages and how to inspire girls—and boys—to consider engineering. Tell your students about it. Not just the ones you would naturally talk to about engineering. Think about all of the kids you teach who are creative, enjoy collaborating with others, are curious and persistent, want to make a difference and like solving problems or improving processes.

While you’re visiting the website, download video profiles of interesting young female engineers and show them to your students. Are they environmentally conscious? So is Tanya Martinez, who is helping communities expand their renewable energy resources. Are your students worried about world poverty? Meet Daniele Lantagne, who designs water purification systems for people around the world. Are they interested in space exploration? Vanessa Aponte works on the team at NASA that will send astronauts back to the moon. These engineers model how their profession is a creative endeavor that enables them to effect real change in the world.

In addition to the profiles, EYL offers many more features, including: 10 great reasons to consider engineering as a career, which includes never being bored, designing things that matter, traveling, being creative and making a good salary; resources for helping teens understand the path to becoming an engineer; overviews of engineering’s many interesting subfields; and advice on researching colleges with engineering programs and pursuing financial aid. Plus, there are tips for teachers and counselors on how to talk about engineering with teenagers. There is also a “Find Your Dream Job Quiz” on the EYL Facebook Fan Page.

### **What will change?**

But will simply changing the way we talk about engineering change girls’ perceptions? Yes, it will. Since EYL launched in 2007, an independent evaluation has found EYL is sparking an interest in engineering—88% of girls familiar with EYL list engineering as their No. 1 career choice. And it is inspiring girls to take an engineering class in college. But perhaps the most telling thing we’ve found is that EYL is helping to break down stereotypes about engineering and giving girls an understanding of the rich variety of interesting jobs available to engineers.

Jill Johnson, an engineering teacher at Career Pathways Academy in St. Paul, MN, reports her success this way: “I used the information from the website to give an auditorium presentation to high-school students encouraging them to take Project Lead the Way engineering classes. I changed my PowerPoint from, ‘Engineering students like science and math,’ to ‘Engineers change the world, make a difference, are creative,’ which are all the points from your ‘Why engineering?’ page. In other years, I had boys come up and ask how to sign up. This was the first time girls came up and talked to me!”

As long as young people misunderstand engineering, they won’t choose it for their future. As a nation, we accept the status quo at our peril. Remember, talk to students and tell them how engineers are constantly changing the world. Tell them engineers are dreaming up creative, practical solutions and working with other smart, inspiring people to invent, design and build things that matter.

*Thea Sahr is the associate director of educational outreach at Boston’s WGBH public broadcasting channel. Engineer Your Life is funded by the National Science Foundation, Northrop Grumman Corp., the United Engineering Foundation and Stephen D. Bechtel Jr., and*



*supported by a coalition of more than 100 partners (such as National Academy of Engineering, National Engineers Week, National Association for College Admission Counseling, IBM, DuPont, University of Colorado and Purdue University). The program now reaches thousands of high school girls and boys promoting consistent, coordinated and positive messages about engineering. For more information about the program, visit [www.engineeryourlife.org](http://www.engineeryourlife.org).*