How Role Models Can Make the Difference for Girls

Role models can, indeed, change the world, but it doesn’t happen automatically. To be effective, training and familiarity with best practices are essential. Here are some proven strategies.

By Linda Kekelis, Ph.D., and Jennifer Joyce, Ph.D., Techbridge
As you reminisce about your experiences as a student, in grade school, high school, or university, think about who inspired you to become who and what you have become today. Can you offer that inspiration to others?

When did you know that you wanted to be an engineer? Many engineers recount that their interest came from early build- or take-apart projects or from the encouragement of a parent who was an engineer. What about girls who haven’t been encouraged to tinker or take things apart, or girls who don’t know an engineer? This is the reality for many girls. Often girls are simply not exposed to experiences that would encourage their interests in engineering. In fact, messages that they receive from the media or in school or at home tell them that engineering is not for girls.

Research shows that few kids — male or female — are interested in a career in engineering. With nearly a third of them believing that “engineering would be a boring career,” is it any wonder? And even fewer girls than boys are interested in engineering. Girls are more likely than boys to think that engineering is difficult. Girls express less confidence in their abilities to succeed and to persevere.

There is a gender divide not only in interest and perceptions, but also in the guidance provided by parents. In one study, a surprising 21 percent of girls report that they have been encouraged to be an actress while only 10 percent were encouraged in engineering. Studies show that African-American and Hispanic girls have high interest and confidence in science, technology, engineering, and mathematics (STEM) but fewer supports and less exposure to science and engineering experiences.

The good news is that girls would consider engineering as a career option if they knew more about what engineers do. Girls who are interested in STEM are more likely to know a woman in STEM and have support networks to help them plan their futures. At Techbridge, we have seen firsthand that role models can address these gender gaps in interest.

**Techbridge empowers girls in STEM**

With a mission to inspire girls to change the world, empowered by science, technology, and engineering, Techbridge is a nonprofit based in Oakland, California. We believe that every girl should have the opportunity to explore her options in STEM. With support from a network — peers, families, teachers, and role models — we turn girls on to science, technology, and engineering both in and out of school.

Techbridge has served more than 5,000 elementary, middle-, and high-school girls in after-school and summer programs in Oakland and surrounding communities. We are especially committed to working with girls from underresourced communities who may not know an engineer. With 15 years of experience, Techbridge has learned what gets girls excited about engineering and thinking about their futures and what role models need to inspire girls and guide them.

Techbridge creates a safe place where girls can try new activities and challenge gender stereotypes. For example, in our Girls Go Global project, girls design and build products to carry water, cook food, and create light. In the process they learn how to work collaboratively and explore the experiences and needs of girls in other parts of the world. Tinkering and creating a working project is a wonderful experience, but just as important is learning how to persevere — to not give up the first or second or third time. During projects like Girls Go Global, girls experience the engineering design process. Troubleshooting and redesign help girls develop the mindset that failure is an important part of learning; hard work, trial and error, and enlisting support from others are all part of the experience.

Girls love hands-on projects, but often regard them as a hobby or craft and don’t make a connection to careers and real-world experiences. Introducing role models can transform activities into career possibilities. While we don’t expect every girl will become an engineer, we do believe it’s important to show the possibilities in engineering that girls never imagined. Role models help do just that.

Shayla Bennett, a longtime role model and SWE member, shared this about her experiences doing outreach:

> While all the girls have totally different personalities, it is the same light in their eyes that reminds me that what I do, what we do, is important. Their eyes said, ‘Wow! I can do this!’ As a role model, it is a feeling that never gets old or dull. Just thinking of them pushes and pulls at the best in me as I create programs and events. They remind me that it’s not enough that the hands-on activities are fun or cool, but that I am prepared to have a conversation with them. That I can talk with them about the difference between being able to do math and loving math. That I provide not only them with a great experience, but I provide tools, resources, and information to their parents and other adult influencers in their lives.

**Partnership with the Society of Women Engineers**

SWE members have been vital to our work with role models. With passion for engineering and commitment to outreach, SWE members have what it takes to inform and inspire girls. Through the Role Models Matter Project, a grant funded by the National Science Foundation, we have partnered with several SWE sections across the United States to develop resources to support the outreach efforts of SWE members. Together we have created Engage, Connect, Inspire: SWE Role Models Change the World, a resource outlining facilitation strategies, including questioning techniques, feedback strategies, and tips to lead a meaningful reflection.

These strategies are designed to help SWE members effectively interact with girls while exposing them to the wonders of engineering to pique their interest and motivation to pursue a career in STEM. In addition, together we developed and piloted an in-person role model training and an online training toolkit. The online Role Models Matter Toolkit mirrors the in-person training and printed guide with additional resources, including readings and hands-on activities and

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icebreakers to use with girls.

The training, guide, and online toolkit highlight strategies that help engage girls and transform fun activities into meaningful experiences. Randy Freedman, SWE’s K-12 outreach manager, has been integral to the partnership and development of the resources. SWE is a great supporter of outreach efforts across the nation and encourages preparation and collaboration to create a meaningful event for both girls and role models. Said Freedman:

We recognize the importance of role models in creating opportunities for girls to experience engineering, and we know that we can increase their effectiveness by teaching our wealth of role models important and easy best practices to make their interactions stronger.

Training isn’t a “nice to have” — it’s essential

There are many different ways to get out and work with groups of future young engineers and scientists. You could host a field trip at your company, work with an after-school program, connect with teachers during the school day, or be part of an event at your company or university. The possibilities for reaching out are endless. What’s important is planning how you will interact with girls once you meet them.

Whether you are new to outreach or have years of experience, a few key tips will help make your interactions successful for both you and the girls. Techbridge developed a model to help role models dispel stereotypes and inspire girls with their passion and personal stories. We recommend hands-on projects that offer a snapshot of work, but most importantly, connect with girls’ interests. Our proven strategies will help you effectively communicate how your work matters and offer girls inspiration and guidance to discover their future careers.

Dispelling stereotypes

We ask girls to draw a picture of a scientist or engineer and describe their images. Generally their drawings illustrate stereotypes about engineers that are commonly held by kids — nerdy, white, alone, and male. Role models are our best ambassadors for dispelling these stereotypes.

As a role model, highlighting your experiences shows that girls and women are successful in engineering. Describe collaborative and creative projects. From your conversations, girls will discover that engineers have interesting hobbies and interests outside of work — like playing soccer, rock climbing, cooking, listening to music, and spending time with family and friends.

One of our Techbridge alums, a recent college graduate, shared this story about a role model who inspired her when she was young:

One of the first role models I met was an engineer, Lyn Gomes. She came in to talk about her career and how she got there. Though most of my classmates might remember her best by her distinct pink hard hat, what stuck out to me was that her favorite hobby was working on cars. I liked that she was bold and confident. She talked about and showed us pictures of herself at job sites with other engineers and what it was like to be one of the only women, or the only woman, working on a project. Her job sounded interesting, but her hobby made the biggest impact on me. At that time, I didn’t think girls could work on cars, either because it was ‘too dangerous’ or because no one would take the time to teach us.

She talked about how when she was our age, she would take apart cars and put them back together with her stepdad. It was inspiring to me that she had such a technical hobby, and had been doing it since she was 12 years old. She was allowed to, and encouraged to explore mechanics in a practical way from a young age. It made me think, ‘What am I interested in? What do I want to make?’ and that those questions could help guide me to my career in the distant future. After her visit, all of the girls in the summer academy wanted to work on cars!

The next summer we spent a lot of time learning how things worked, taking apart lawn mower engines, and learning how to do basic maintenance on cars. Lyn has had a lasting effect on how I think about both work and my hobbies. She inspired me to think outside of the gendered roles that force boys and girls to play with different toys and do different activities. Techbridge provided an environment where my curiosity was encouraged, and I could be fearless in my exploration of new things.

Reducing the confidence gap

Confidence is a major factor that holds girls back from STEM studies and careers. Grit and perseverance are important life skills. They are essential for engineers who work on projects that don’t have easy solutions. Persistence is needed when girls take an advanced math class in high school or go on to college and enroll in challenging majors or struggle with a course. We want them to feel confident that they can work through problems, find resources, and stay the course.

As you plan your outreach, think back on what challenges you faced along the way. In your introduction and during question-and-answer period, talk about
the struggles you overcame as a young girl and how you face challenges in your work today. From your personal journey, girls will learn that not every role model was a super “brainiac” and that some struggled with math in middle school, some have learning disabilities, and that many are just like they are. It helps girls to know that they’re not the only ones who question themselves or their belonging in engineering.

During a visit at a high school after-school program, one role model shared her story about her family and her life growing up. As a part of this story, she revealed that she had a learning disability, and as a kid, had difficulty in school. One young girl in the program looked over at the program coordinator and mouthed the words “like me” with a big smile on her face. By simply sharing her story and her struggles, this role model had connected with the girls.

As important as it is to share your struggles, it is vital that you describe what you do to build confidence and overcome doubts. Share examples of asking for help from a teacher, finding tutoring support, and creating a study group. It’s important to describe how you work hard on your own, and when you seek outside assistance to work through challenges.

**Sharing your passion**

We have heard from many role models how important it is to take off their “engineer hat” and put on their “role model hat” when they do outreach. A formal technical presentation may be appropriate for work, but it won’t help you connect with girls. Role models find that they have the greatest impact when they keep in mind the importance of making a personal connection with girls. They remind themselves not to let the presentation of information get in the way of meaningful connections.

Practice telling your story and talking about engineering in a dynamic way. Share pictures of projects or products you have worked on, and be sure to share how and why these are important to you. Use body language and tone of voice to convey the excitement you feel inside. To work through any nervousness or jitters, invite a friend to give feedback on your presentation or activity. Your enthusiasm and passion for your work will inspire girls to want to learn more. When you get excited about what you do as an engineer, girls will, too.

Reflecting on her experience, engineer Josetta Jones said:

As a role model you have to really know that the girls want to have you here with them. They may not verbally express it, and that’s when you have to go back and say, ‘Hmmm. I remember what it was like to be an eighth-grade girl where, I didn’t want to open up with an adult I didn’t know,’ but know that inside they’ll go back and they’ll talk to their friends about the day, or talk to their parents, or maybe even their teacher or program coordinator who’s at the school, and that you are making an impact.

**Making it relevant**

We hear from girls that they want to make the world a better place, but may not see how technology and engineering help do that. That’s understandable because most girls know little about what engineers do. You can show them otherwise. Explain how engineers and the work they do play an important role in fixing social problems in their communities and around the world. What other job can help us reimagine the future?

It all began in middle school when I joined an all-girls engineering program called Techbridge. I learned about robotics, circuits, and (my favorite) soldering. After meeting with real engineers, I could see myself having a job just like theirs. This motivated me to participate in the Engineering Academy offered at my school. There I was taught about VEX robotics and AutoCAD computer programming. While taking courses of science and engineering in high school, it came to my attention how unusual it is to see a Latina pursuing a career in these fields. But my interests in them have kept me striving.

Techbridge has given me the amazing opportunity to visit Pixar headquarters. This was a true turning point for me in getting a firsthand glimpse of working there. I left ready to start my life at the University of California, Berkeley to study computer science and...
Making it hands-on with the engineering design process

By introducing something to the girls that is key to your work — the engineering design process — you engage the girls in a real-life experience. The engineering design process can be empowering by promoting experimentation, creativity, and learning from mistakes. Be sure to provide a hands-on design challenge to help strengthen girls’ “confidence muscle” and allow them to experience the fun and challenge of engineering.

One Techbridge role model, Consuelo Crosby, P.E., a structural engineer, shared this thought after working with a group of fifth-graders designing earthquake-safe structures:

I love that they didn’t get disinterested. That’s a great sign of innovation, just to keep trying and changing and modifying, by seeing what needs to be fixed. It is just part of your given day as engineers; you can’t get discouraged because you’re always creating something new from nothing. It’s what we do.

Reflecting on the experience

Just as you evaluate your performance on the job, it’s good practice to assess your work as a role model. We encourage you to work with partners to evaluate your outreach. After a visit to a Girl Scout troop, a university event, or a summer or after-school program, talk with partners to share what worked well, as well as what can be improved upon. It is also important to think about how your outreach efforts have affected you. Did you reignite your passion for your work? How did it feel to give back and inspire a girl to follow her dreams?

Judy Wan, an astrophysicist, shared this thought about her experience:

Being a role model is actually really rewarding and satisfying. Transferring that passion and seeing that passion light up in a particular girl makes me really happy that I’ve done what I had sought out to do: motivate and empower these girls that they can do anything they want if they really put their minds to it. And I think if they can see that and I can see that in them, and I can transfer that type of passion, then it makes it the most rewarding feeling in the world.

There are lots of girls who need a supportive adult to encourage them. Every girl you teach may not become an engineer, but you can make certain that every girl has had the chance to experience the wonders of engineering and meet a role model.

Toolkit and additional resources

We hope that what you’ve read makes you want to engage in outreach this school year. If you would like to learn more about effective practices as a role model, we created the Role Models Matter Toolkit to make every outreach experience a success. The toolkit includes icebreakers, hands-on activities, and sample agendas for field trips. These resources were developed with support from the National Science Foundation.

Engage, Connect, Inspire: SWE Role Models Change the World is a resource guide that provides suggestions and guidance on planning successful classroom visits and work-site field trips. The guide is available online at www.techbridgegirls.org and print copies are available at the SWE Bookstore: http://www.abdi-commerce10.com/swe/.

Looking for an easy way to host an outreach event? In Engineers to the Rescue, survival skills meet engineering in this kit that encourages problem-solving and self-reliance. Techbridge developed this program-in-a-box that features SWE role models and includes materials and lesson plans to take the guesswork out of outreach and support role models.

Want to give something to girls to take home so they can continue exploring engineering with their families? Techbridge offers the resource guide, Science: It’s a Family Affair, which you can pass along at your SWE events. http://www.techbridgegirls.org/index.php?id=28. We offer curriculum and training to help adults bring engineering to girls across the country. We would like to support you and learn about your experiences with our Role Models Matter Toolkit. You can email us at info@techbridgegirls.org.

Linda Kekelis, Ph.D.: When I was 10, I had two dreams for my future: mother and teacher. These were the roles I saw in the women in my life. I never crossed my mind that I could be an engineer, which is what my brother grew up to be. Yet, I did like to build — I made furniture for my Barbie® dolls with my brother’s Erector® set. When I put away the dolls, I stopped playing with the Erector set. If I had a role model, perhaps I would have become an engineer. At Techbridge, I see girls inspired by role models who show them the rewards of engineering.

Jennifer Joyce, Ph.D.: I have been involved in education for more than 20 years in one form or another. There is nothing I enjoy more than seeing the moment when kids do something they never thought they would or learn that they can become something they thought would be impossible for them. Our kids deserve every possibility, and role models are key to making possibilities a reality.

Additional Information