

## **AC 2008-1213: ENGINEER YOUR LIFE: TALKING TO HIGH SCHOOL GIRLS ABOUT ENGINEERING**

### **Thea Sahr, WGBH Educational Foundation**

Focusing on science and engineering projects such as Design Squad, ZOOM, Building Big, and Pathways to Technology, Ms. Sahr has extensive experience conceptualizing national outreach initiatives and working with project teams to develop multimedia educational materials (e.g., activity guides, curricula for after-school providers, online training resources for professionals, web sites, etc.) Building relationships with national partners representing teachers, museums, engineers, scientists, and after-school providers, has resulted in tens of thousands of children exploring science and engineering with WGBH resources. In addition, Ms. Sahr has facilitated training workshops around the country where educators learn how to incorporate WGBH's educational resources into their programming and engineers and scientists learn how to engage youth. Ms. Sahr has her M.Ed. from Boston University.

### **Natalie Hebshie, WGBH Educational Foundation**

## **Engineer Your Life: Talking to High School Girls About Engineering**

### **Abstract:**

In 2004, members of the engineering community formed a coalition to examine the question: “Why are academically prepared girls not enrolling in engineering degree programs?” Qualitative consumer research was conducted with high school girls, school counselors, and engineers that found that current messages regarding engineering emphasize “the necessity of superior math and science skills” as well as the notion that engineering is “a challenging and stressful career”—messages that have little relevance to high school girls.

In 2007, the coalition developed and tested new messages about engineering. Three compelling messages—creativity has its rewards, explore the possibilities, and make a world of difference—are now the centerpiece of a national campaign designed to encourage college bound girls to consider engineering. The campaign will introduce high school girls to young women engineers who embody these messages; showcase engineering careers and illustrate that an education in engineering is both desirable and within their reach; help school counselors and teachers better understand engineering and give them the resources and training they need to advise students; and, mobilize America’s more than one million engineers with compelling resources, training, and messages to use in their ongoing outreach efforts.

The Engineer Your Life project is a national initiative to encourage college bound girls to consider pursuing a degree and subsequent career in engineering. A coalition of the country's engineering associations and the American Association of Engineering Societies (AAES), the American Society of Civil Engineers (ASCE), the National Engineers Week Foundation (Eweek), National Association for College Admission Counseling (NACAC), and WGBH Educational Foundation is leading the project. In preparation for an Engineer Your Life poster session at the 2008 ASEE Conference, this paper will explore the elements of the Engineer Your Life campaign as well as the research that formed its approach.

## **Project History**

Between June 2004 and January 2007, the coalition has accomplished the following:

### *Original Research—June 2004 to January 2005*

WGBH conducted qualitative consumer research with high school girls, science and math teachers, school counselors, male and female college-level engineering students and engineers to answer the question, “*Why are academically prepared girls not considering or enrolling in engineering degree programs?*” We found that the current messages used to persuade girls to consider engineering are not effective. Neither the emphasis on “math and science” nor the notion of “a challenge” is relevant for high school girls. For a full report go to [www.engineeringwomen.org](http://www.engineeringwomen.org).

### *Strategic Recommendations—May 2005*

At the 2005 NAE/AAES convocation, the coalition released our research and recommended a fundamental shift in the way engineering is portrayed. Rather than focusing on the process and challenges of becoming an engineer, we recommended focusing on what an education and career in engineering looks like, specifically addressing what the girls in our research identified as being their motivators for choosing a career.

### *Published Changing Our World—February 2006*

Publication of *Changing Our World: True Stories of Women Engineers* represented a significant milestone for EYL. Through the real-life stories of women engineers, this richly illustrated 240-page book, written with a foreword by Dr. Mae C. Jemison, celebrates the tremendous contributions of women engineers to every aspect of modern life. When placed in school libraries and counseling centers, the book will provide girls and their parents with a fresh perspective on engineering.

### *Raised Project Funding—ongoing*

To date, the National Science Foundation, Northrop Grumman, the United Engineering Foundation, Stephen Bechtel, and countless others have made significant contributions to fund the project. At present, the coalition is still seeking finishing funds.

*Coordinated with NAE Public Understanding of Engineering Project—Ongoing*

To ensure we are not creating redundancy or resources that conflict with other efforts, the coalition is collaborating with NAE's Public Understanding of Engineering (PUE) committee. This strategy has allowed the coalition to be the first project to build on their important work.

*Developed And Tested New Messages—January 2007*

The coalition hired the same companies that worked for NAE's PUE committee (BBMG and Global Strategy Group) to develop and test messages that are relevant to college-bound girls. BBMG developed eight messages and six tags. In January, 2007 Global Strategy Group conducted a nationwide online survey of 440 college-bound girls and boys, ages 14-18, to test messages, taglines, and messengers of information about engineering and careers in engineering, with a margin of error of +/-5.4%.

Among girls, four messages tested the strongest:

- Live your life, love what you do: Engineering will challenge you to turn dreams into realities while giving you the chance to travel, work with inspiring people and give back to your community.
- Creativity has its rewards: Women engineers are respected, recognized and financially rewarded for their innovative thinking and creative solutions.
- A world of difference: From small villages to big cities, organic farms to mountaintops, deep-sea labs to outer space, women engineers are going where there is the greatest need and making a lasting contribution
- Create possibilities: Women engineers often use their skills to go into business, medicine, law or government. An engineering education will prepare you for many different careers.

Among girls, two taglines tested the strongest:

- Engineer Your Life: Dream big. Love what you do.
- DYL: Design your Life, Engineer Your Future

*Developed and Tested Visual Direction—January 2007*

With these messages as our starting place, WBGH developed three possible design directions for the project. These prototypes were tested with 618 college-bound girls with a margin of error of +/-3.94. The results have guided the graphic development of all project resources.

*Soft launch of Web site—September 2007*

The Engineer Your Life Web site had a softlaunch in Fall 2007 with it's main sections for high school students and counselors and parents. The site will officially launch with a section for

engineers and added resources for counselors and parents during National Engineers Week in February 2008.

## **Engineer Your Life Campaign**

Many high school girls care deeply about making a difference in the world, whether it is preventing disease, reducing poverty, or protecting our planet. Engineering merges this passion with the actual know-how to solve these pressing problems. Yet, too few academically prepared girls (and boys) are studying engineering in college. The Engineer Your Life (EYL) campaign is out to change all that. The Engineer Your Life campaign will:

- Introduce high school girls to young women engineers who embody these messages.
- Showcase engineering careers and illustrate that an education in engineering is both desirable and within their reach.
- Help school counselors and teachers better understand engineering and give them the resources and training they need to advise students.
- Mobilize America's more than one million engineers with compelling resources, training, and messages to use in their ongoing outreach efforts.

If a girl understands what engineers do—develop a safer car seat, build a school that can withstand an earthquake, or design a high-tech running shoe—she might discover that engineering offers exactly what she's been looking for. Furthermore, an engineering education opens doors to all kinds of careers—doctor, business professional, teacher, and of course—engineer.

### *Web site*

Anchoring the campaign is the Engineer Your Life Web site for high school girls and the adults in their lives who want to learn more about what life and work are like for engineers. Research reveals that most kids and adults don't know what engineering is, and if they had to guess, they'd tell you that engineers sit alone at a desk all day doing math problems. But a quick look at the women profiled on this site shows that engineering is in fact creative, involves lots of teamwork and collaboration, and is making a real difference in people's lives. Ultimately, we hope that the site will break down stereotypes about engineering and encourage girls to consider it as a career option. The site features four main areas:

- [Why Engineering?](#): When testing this site, high school girls told us how much they loved the site but still wanted a clear definition of what engineering is. This section provides a definition as well as ten great reasons to become an engineer.

- Meet Inspiring Women: This section features 12 young engineers who are doing things most may not think of as a typical engineering career. Like Shaundra Daily who developed software that lets high school girls express their emotions or Daniele Lantagne who combines her passion for protecting the planet with her degree in environmental engineering to make a difference.
- Find Your Dream Job: This section explores the various fields of engineering, whether it's creating cutting-edge animation for Hollywood or protecting the planet by developing state-of-the-art recycling systems. Within each engineering field, girls can explore types of job opportunities and projects, salary ranges, and meet more engineers.
- Making It Happen: This section of the site offers tips for how to explore engineering, prepare for college, research different programs, and find scholarship and financial aid information. All of the information in this section is also available in downloadable pdf documents for counselors to use when advising students about engineering.

The site also has a “For Counselors and Parents” section, and a “For Engineers” section. Many people who love being engineers have said that they didn't consider engineering or even know what it was until an adult suggested it as a career option. “For Parents and Counselors” helps counselors, parents, and other educators to first and foremost, understand what engineering is, and to then identify potential engineers, advise students, and train others to do the same. “For Engineers” helps engineers understand engineering's image problem, what girls want from their careers and why they think engineering can't satisfy their aspirations, compelling engineering messages, how to inspire the next generation, and how to get more involved in the Engineer Your Life campaign.

#### *Engineer and Educator Trainings*

Members of the coalition are hosting trainings around the country for engineers and educators. Engineers who attend the trainings will learn how to better communicate about their profession with students and adults who influence them. Like the girls they advise, school counselors do not have a clear picture of engineering careers or the value of an engineering education. To counter this, the coalition is hosting trainings where they can learn about engineering and get resources they can use to counsel students and inform their parents.

#### *Reaching Girls and their Parents*

To drive traffic to the girls' site the coalition is mailing a postcard to every sophomore girl who scores over 55 on the PSAT in the late winter of their sophomore year and again in the fall of junior year. The coalition is also hosting Engineer Your Life tables at NACAC College Fairs across the country. Staffed by real engineers, the coalition will distribute Engineer Your Life brochures and posters. An online marketing campaign is also being devised to drive traffic to the site.

#### *Building the Coalition*

The Engineer Your Life coalition invites other organizations to join the campaign and send a unified and relevant message about the rewards of being an engineer to girls. Coalition members are asked to:

- Deliver unified and relevant messages about engineering
- Evaluate their programs and messages against the research: To what extent are messages to high school students reaffirming what is important to them?
- Receive training on how to effectively implement these messages in their programming
- Promote the project and its resources to members of their community
- Receive free turnkey resources—posters and brochures
- Connect their organization and their members to the school counselor community

### **2008 ASEE Conference**

The Engineer Your Life poster session at the 2008 ASEE Conference will provide attendees with campaign resources that incorporate tested messaging, including posters, brochures, handouts, and postcards. Copies of the research report, an overview of the EYL Web site and outreach plan, and information on how to get involved in the campaign will also be shared.