

Science and Culture: Making a pitch for female engineers

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High school is going great for pretty, 15-year-old Emily, until she accidentally burns down the school gym during the science fair. As a result, Emily faces an ultimatum: get expelled or join the school's Science and Engineering Club, which her popular friends brand the "social suicide club." Emily chooses the club and discovers she has a knack for solving engineering problems.

Could such a story entice teen girls toward a career in engineering? Jayde Lovell hopes so.

It's her winning pitch in The Next MacGyver Competition, a contest organized by the National Academy of Engineering (NAE) and the University of Southern California (USC) Viterbi School of Engineering in collaboration with Lee Zlotoff, creator of the 1980s hit television show *MacGyver*. The competition invited entrants to create a television series showcasing a heroic female engineer. Lovell, manager of the New York Hall of Science's media program, says she herself

might have studied engineering with the right role models and encouragement.

Lovell and other hopeful show creators, including both engineers and fledgling writers, mingled with television executives at the competition's pitch event, held July 28, 2015 in Beverly Hills, California. Some of the proposed characters were seasoned engineers; others, like Lovell's, were just starting to tinker: they used their engineering know-how to foil bad guys or to colonize Mars. Competition winners received \$5,000 and were paired with a Hollywood mentor to help them script a pilot episode, in the hopes of selling their idea to a network.



Among the winners of The Next MacGyver Competition was Shanee Edwards, who pitched a historical fiction television show about Ada Lovelace, the daughter of poet Lord Byron. The show, touted with this concept art, would have Lovelace, a mathematician, work with real-life 19th century polymath Charlie Babbage in pursuit of a super machine that can be programmed to think like a human. Image courtesy of USC Viterbi School of Engineering and Zoe Chevat.

Each week on *MacGyver*, the iconic television character Angus MacGyver, a secret agent played by a mullet-headed Richard Dean Anderson, escaped from sticky situations with little more than a paperclip or roll of duct tape, plus engineering ingenuity. Zlotoff says he has long lost count of how many people tell him MacGyver inspired them to study engineering or science. His MacGyver Foundation supports people and organizations that use nonviolent and self-reliant means to improve lives.

The field of engineering needs another hero like MacGyver, says Randy Atkins, director of communications at the NAE. Engineers apply their scientific knowledge to solve all kinds of problems and create a better world, but young people aren't cognizant of their crucial role. Ask a sixth grader what an engineer is, he laments, and they'll answer, "Isn't that the guy who drives the train?" The NAE, the Viterbi School, and Zlotoff want to do for engineering what *CSI: Crime Scene Investigation* did for forensic sciences, bringing a technical job to the fore and making it cool. (The contest was sponsored by the United Engineering Foundation, Ford Motor Company, Google, and NAE member Barry Boehm.)

Importantly, the new hero should be female, say contest organizers. In the United States in 2012 (the latest year for which National Science Foundation data are available), women earned just 19% of bachelor's degrees and 23% of doctorates in engineering fields, including aerospace, chemical,

civil, electrical, industrial, materials, mechanical, and other types of engineering (1). The workforce numbers are even more dismal, as only 15% of working engineers in the United States were female as of 2013 (2). Although there are engineers on television, and some are women, none have that MacGyver star power, Atkins notes. And he has little doubt that a woman engineer could anchor a hit television show. "We got a lot of interest from people in Hollywood," he says. "I think we actually have a shot at having a show made."

The contest, announced in February 2015, attracted nearly 2,000 pitches. Twelve finalists developed a detailed treatment and traveled to Beverly Hills' Paley Center for Media for the July 28th session to present their ideas to a judging panel of both engineers and television producers.

In addition to Lovell's high-school drama, four other pitches made the cut. In Beth Keser's procedural *Rule 702*, heroine Mimi travels the country serving as an expert witness on cases with an engineering element, trying to solve each mystery before the court date. Craig Motlong's *Q Branch* features the engineers who design and field-test James Bond-esque gadgets. Miranda Sajdak's World War II drama, *Riveting*, sends a prom queen into the military engineers corps. And in *Ada and the Machine*, Shanee Edwards reimagines Ada Lovelace, a real-life 19th century

computer pioneer, helping Scotland Yard bring down antitechnology Luddites. In honor of MacGyver, Zlotoff presented each winner with a roll of duct tape.

Some competitors and judges, particularly those with engineering backgrounds, expressed interest in a female character who would be a role model without perpetuating a stereotype. "In the media, the female scientists are often very eccentric or overly sexualized," says finalist Nao Murakami, a doctoral student in aerospace engineering at the University of Washington in Seattle. "You don't have to look like a supermodel to become an engineer." She and others also commented that the character should not be a supergenius or holder of multiple doctorates, like some television scientists, but an engineer with a realistic career path.

Could that realistic television character really inspire the next generation of female engineers? Murakami thinks so. She was in college when the medical drama *Gray's Anatomy* premiered, and for several of her girlfriends the female surgeons on the program reinforced their interest in medicine, she recalls. Many of those friends went on to become doctors.

Participants hope the July event, and any show it spawns, will reinforce an interest in engineering. "I want my daughters, future engineers," said Keser during her pitch, "to walk into their workplace and find it half-filled with female engineers."

1 www.nsf.gov/statistics/2015/nsf15311/digest/theme2.cfm#engineering. Accessed September 4, 2015.

2 www.nsf.gov/statistics/2015/nsf15311/digest/theme5.cfm#women. Accessed September 4, 2015.