

EDUCATION ISSUE: Women of Color | Co-ops and Internships | Financing the Future

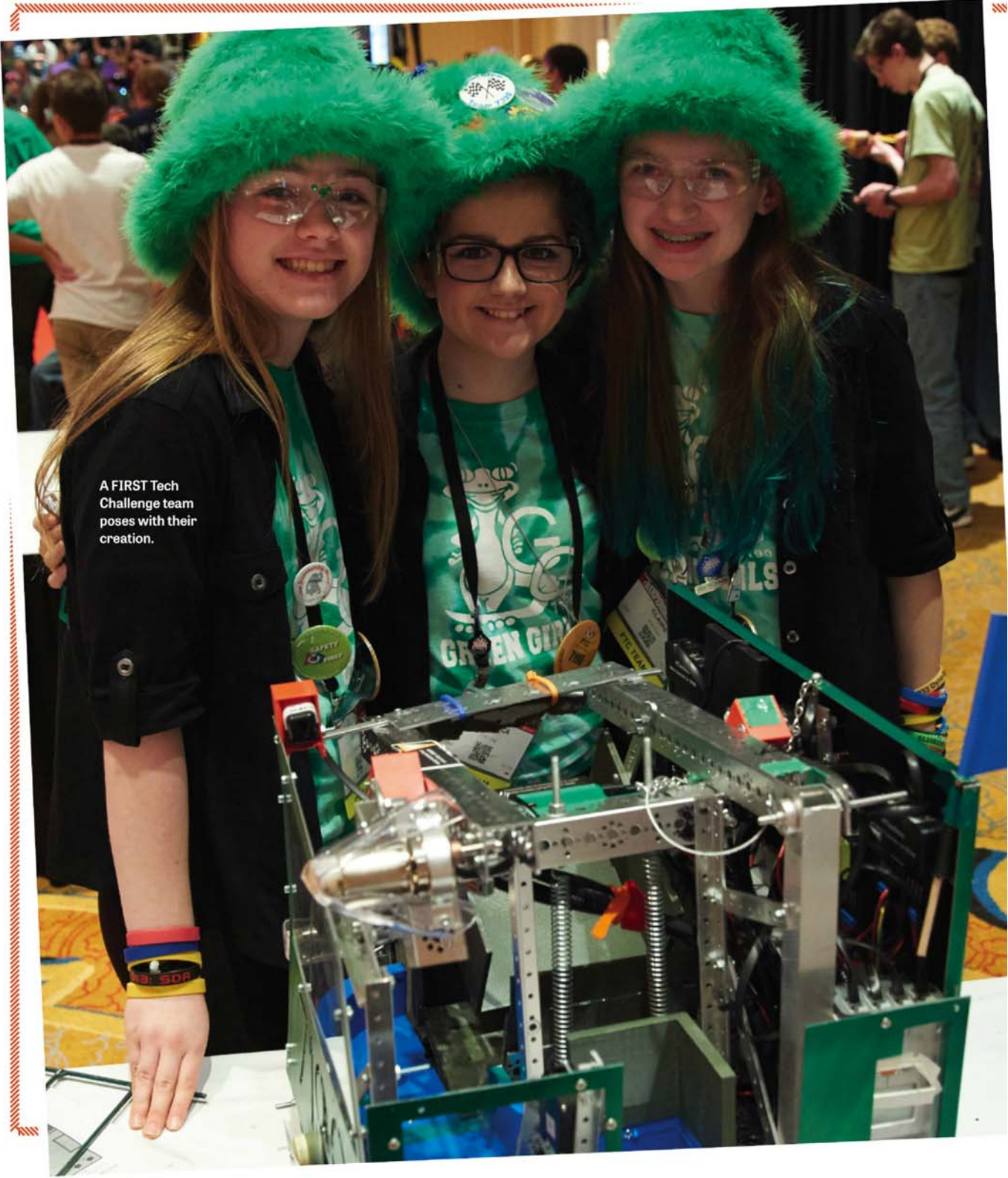
ADVANCING STEM PROFESSIONALS AND STUDENTS

# Diversity<sup>TM</sup> Action

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## Urban Arts PARTNERSHIP



A FIRST Tech Challenge team poses with their creation.

# Encouraging Youth from All Backgrounds

FIRST elevates inclusion and diversity to a top strategic goal

BY LINDSAY PENTICUFF

In response to growing concerns from industry and government leaders about the lack of diversity in STEM fields, FIRST (For Inspiration and Recognition of Science and Technology) elevated inclusion and diversity to one of its five strategic goals and launched its Inclusion and Diversity Initiative in 2014, says Donald E. Bossi, president of FIRST.

Accomplished inventor Dean Kamen founded FIRST in 1989 to inspire an appreciation of science and technology in young people. Based in Manchester, New Hampshire, the nonprofit designs accessible, innovative programs to build self-confidence, knowledge and life skills while motivating young people to pursue opportunities in science, technology and engineering. Most programs are built around the construction of remote-control vehicles, starting with simple LEGO constructions and moving on to full-fledged, multi-skilled robots at the high school level.

"[The Inclusion and Diversity Initiative] is tasked with developing strategies to increase the participation of youth typically underrepresented in the STEM fields, including girls, underrepresented minorities and youth from low-income communities," Bossi says.

"Initial steps taken include establishing a baseline and setting goals for the program, researching best practices in STEM diversity, recruiting a program manager to lead the initiative and conducting training on equality with FIRST leadership, staff and partners. Future activities include providing training for mentors and volunteers, refining program messaging and funding grants to help start teams in low-income areas."

Since its inception in 1989, Bossi says FIRST has consistently encouraged youth from all backgrounds to participate in its Progression of Programs — a series of programs for students ages 6-18 that is designed to help them discover and develop a passion for STEM. The 2014-15 FIRST season reached more than 400,000 young people in more than 80 countries around the world, and brought 18,000 of them to St. Louis in April to compete in four days of FIRST Championship events, culminating in the dramatic FIRST Robotics Challenge for high school teams. By competing and collaborating, students learned valuable leadership and problem-solving skills as they gained self-confidence, made new friends and explored a potential future in the STEM workforce firsthand.

Two efforts at FIRST — Alliances and the VISTA (Volunteers in Service to America) Program — have already been successful in reaching diverse youth. "For seven years, FIRST has developed strategic alliances with a number of nonprofits that assist FIRST by recruiting diverse youth to our programs, providing diverse mentors and coaches or sponsoring diverse teams; examples include Girl Scouts, the Society of Women Engineers, Boys and Girls Clubs and the Society of Hispanic Engineers," Bossi says.

After many years as an intermediary AmeriCorps program with four to five VISTAs working to expand FIRST programming, FIRST received an operational grant from the AmeriCorps VISTA Program in 2013. The FIRST VISTA program now includes up to 50 VISTA members located throughout the U.S. Members commit one to two years of service to FIRST. FIRST headquarters administers the AmeriCorps VISTA grant and supports the programs while local FIRST field staff work with VISTAs to provide services to low-income communities. VISTAs work with teams, schools, businesses and nonprofits in the local community, bringing FIRST programs to underserved youth. FIRST VISTAs have recruited 2,379



At the FIRST Robotics Championship event, team members consult on strategy. FRC is often called "a varsity sport for the mind."

coaches and mentors and 6,021 youth on teams in underserved communities, supported 11,931 coaches and mentors with underserved teams, and raised \$630,065 in cash donations and another \$427,188 in-kind donations to support FIRST teams and programs in underserved areas.

"We are committed to ensuring that all students regardless of gender, race, ethnicity, disability or income have access to our programs," Bossi says. "We believe by creating an equitable environment where any student is accepted and feels welcomed, FIRST can provide opportunities to inspire students to become interested in STEM education and careers.

"Especially in underserved communities where the culture or environment may not inherently tell kids that STEM can be cool and fun and they could be good at it, it's important to have early intervention before perceptions about themselves and career options are set. It is essential that future industry and technology leaders reflect the

demographics of the broader population in order to create the innovative solutions, products and services that will address society's greatest challenges."

#### Collaboration is Key

Partnering with the Society of Women Engineers and funded through the Motorola Foundation, a groundbreaking grant recognized teams in the FIRST Robotics Competition program for their efforts in creating and/or maintaining team gender equality. The grant also recognized a woman driver for her qualifications to represent her team in such an important capacity. "More than 200 applications were submitted and ultimately 40 teams in 24 states were awarded \$1,000 each," Bossi says. "Teams had the opportunity to connect with local SWE sections and meet successful women working in key STEM roles. As a result, relationships were formed with these teams that will continue into the future, and many SWE members have signed up as volunteers and judges to

become more involved, creating a reciprocal relationship among STEM professionals and FIRST teams."

Members of FIRST Alliance organizations spoke at events during the 2015 FIRST Championship and shared their personal and professional experiences with FIRST students. Pamela Jackson, vice president of technology for Emerson Electric Company and a leader in the Society of Women Engineers, shared her insight and experience with FIRST LEGO League students during the "Encore Presentations and Medals Distribution" event. Barry Cordero, president of the Society of Hispanic Professional Engineers, shared his successes and challenges with students at the FIRST Tech Challenge Closing Ceremonies. "A new Alliance, SHPE is aligning with FIRST to bring the program to JrSHPE high school chapters throughout the country as a means to engage more Latinos in STEM education/careers," Bossi says. "Both Pam and Barry are great advocates for our mission and believe in 'paying it forward.'"

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In addition to its ongoing work with the Society of Women Engineers, Girl Scouts and the Society of Hispanic Engineers, FIRST is exploring collaborations with other organizations that reach underserved youth. The National Center for Women & Information Technology, a FIRST Alliance member, works to correct the imbalance of gender diversity in technology and computing. Through the Award for Aspirations in Computing program, NCWIT honors young women at the high school level for their computing-related achievements and interests. Awardees are selected for their computing and IT aptitude, leadership ability, academic history and plans for post-secondary education. In 2014, 20 percent of the nearly 3,000 award winners were affiliated with either FIRST Tech or FIRST Robotics.

#### Leading by Example

An award-winning metro Atlanta program is an example of how FIRST teams throughout the U.S. are encouraging underrepresented students to excel in STEM. The Kell Robotics Team, which was formed more than a decade ago, is made up of students from seven high schools and area homeschool students. They work together to develop skills and knowledge in STEM fields with an emphasis on FIRST Robotics programs, in addition to performing outreach to a broad and diverse audience. Ed Barker, the team's director who is also assistant director of Advanced Computer Services at Kennesaw State University (Georgia's second largest university), says, "Our team has an extensive year-round outreach program, participating in 36 to 40 events in each of the last three years. In the past five years, we have spread our message at more than 175 events."

The Kell team is made up of about 30 high school students, about 20 of whom come from diverse backgrounds. In addition to

partnering with the 100 Black Men of Atlanta to promote FIRST to more than 1,000 urban Atlanta school children, and reaching out to the Hispanic community by participating in Fiesta Atlanta, Kell Robotics has continued to develop its women's program for the past nine years. "We conduct workshops at Girl Scout camps every summer. In the fall, we help conduct a STEM robotics workshop at the Girl Scouts Atlanta headquarters and participate in the annual Girl Scouts of Greater Atlanta STEM Expo," Barker says. "We have hosted several Girls Get IT Workshops with Women in Technology." WIT is nonprofit promoting the advancement of women in Georgia's technology community.

The Kell Robotics Team is consistently 60 to 65 percent female. "The females on our team are really the rock stars of STEM," Barker says. "Almost without exception, the young women that have come through the team had initial career expectations that were non-STEM. Over half of them went on to major in engineering or science degrees in college. They have gone on to study a variety of fields, including product development and test, engineering operations, management and consulting.

"I think the students that get this experience of organizing and leading complex work tasks, and doing this in a team environment, are extremely attractive to future employers. You often hear that the top issues businesses have in hiring employees is finding candidates

that can solve problems and work in a team environment. STEM activities such as FIRST Robotics are an excellent training ground for those much needed employees. And it is an excellent way to produce top notch young adults."

Barker's team is also constantly working to expand opportunities for students to participate in STEM programs such as FIRST Robotics. The team has helped start and train more than 33 additional teams, representing half of all the FIRST Robotics teams in Georgia. Kell students have also developed a training and support center — the Kell Innovation Center — to train and support their team as well as other teams in Georgia.

The team has earned seven Regional Chairman's Awards, in addition to awards and recognitions from Georgia Natural Gas, SeaWorld Busch Gardens, White House Science Fair, the U.S. Congressional Robotics Caucus and the National Center for Women and Information Technology. ■



A Kell Robotics Team member adjusts the robot's code during a competition.