

FIRST Impact Award - Team 548

2023 - Team 548
Team Number
548
Team Nickname
Robostangs
Team Location
Northville, MI - USA
Describe the impact of the <i>FIRST</i> program on team participants within the last 3 years. This can include but is not limited to percentages of those graduating high school, attending college, in STEM careers, and in <i>FIRST</i> programs as mentors/sponsors.
Post graduation, 89% of Robostangs have furthered their education in STEM and business fields. Many become developers at Big-Tech companies or expand the Robostangs' impact by mentoring other FRC teams. Our 2 lead mentors are alumni, providing us with knowledge and experience. Furthermore, Jack Ferguson, a leader of the Michigan Engineering Zone, the largest FRC mentorship program in the state, was a past Robostang. Finally, 2 former Robostangs have been recognized by Forbes 30 Under 30.
Describe your community along with how your team addresses its unique opportunities and circumstances.
Northville High School invites us to the STEAM fair, Activities Night, and Open House, where we exhibit STEM to 1200+ students. Fortunately, we have the resources to make a difference. For example, identifying inaccessibility to STEM resources, we ran 2 FIRST workshops for kids at Palaestra Homeschool Facility to give them exposure to STEM. To combat food insecurity in Metro Detroit, we donate over 1100 cans annually to our local food shelters and volunteer at our local food bank.
Describe the team's methods, with emphasis on the past 3 years, for spreading the FIRST message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?
We measure our results based on long-term engagement with FIRST. Our FLL Explore Expo grew to an attendance of 201 kids and FTC to 7 teams. 1 is going to Worlds. To help introduce kids to FIRST, we run Robocamp, which had 43 students this year. These efforts helped bring in 30% of our FRC team. To spread the FIRST value of inclusion, we scaled to over 8 UNIFIED teams at our last event. Through creating lesson plan blueprints for other schools, the program reached several teams across the state.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.
Robostangs are committed to guiding smaller FIRST teams in our community. At the Student Technology Showcase hosted at the Michigan State Capitol, we provided FRC 8774 with guidance on how to launch and expand their programs. The Robostangs donated motors and fabricated parts for other FRC teams

to help support the FIRST community. We also guide Northville FTC and FLL teams in design, mechanical, and software development through their build season and are role models for young FIRST members.

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.

We started 2 FLL Discover teams, 41 FLL Explore teams, 9 FLL Challenge teams, and 10 FTC Teams. This year, we started and mentored 7 FTC teams and 15 FLL Explore teams and started 3 FLL Challenge teams. Over 201 students attended our FLL Explore Expo. We assist 4 FLL Challenge teams and mentor 7 FTC Teams. We also assist 2 FRC teams. We work to start FIRST teams internationally and have recently started our fourth all-girls FIRST team at a foster-kids school in Pune through Project India.

Beyond starting teams, what initiatives have you done to help inspire young people to be science and technology leaders and innovators? What results have you seen from your efforts in the past 3 years?

To introduce young women to STEM, we assist Google in 2 workshops and run 2 more of our own workshops in partnership with Girl Scouts of Michigan. In these workshops, they build their own FLL challenge robot and interact with robotics. After completing the program, they successfully earn a robotics badge. To promote innovation, we run an AI workshop with an MIT Professor with over 100 FIRST attendees to virtually teach students about AI and showcase the applications of technology.

Describe the partnerships you've created with other organizations (teams, sponsors, educational institutions, philanthropic entities, etc.) and what you have accomplished together with emphasis on the past 3 years

We partnered with Girl Scouts Heart of Michigan and Google for Girl Scouts and with Community Financial for Stem Boxes. With Special Olympics Michigan (SOMI), we began the 1st UNIFIED Robotics program in Michigan, where students with intellectual disabilities and FRC peers built a sumo bot. With FRC 503, we introduced UNIFIED to FRC 302, 3536, and 7174 and over 130 athletes from 8 teams. SOMI honored our school as a UNIFIED Champion School, securing funding for future UNIFIED programs.

Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, *FIRST*, and your communities.

Within our team, we provide equal opportunities, shown by our 50% women leadership this year. To increase STEM equity in Detroit, we have run events at Palaestra Homeschool Facility (PHF) since 2019. At PHF, we provide homeschooled students with exposure to STEM by teaching students the principles of FIRST, how to program EV3, and build LEGO robots. Our efforts to make STEM a more diverse community extend to our Girl Scouts and Unified programs, expanding it by running state-wide workshops.

Explain how you ensure your team and the initiatives you have created will continue to run effectively for the foreseeable future

Our commitment to sustainability starts with our pipeline. We foster a love for STEM and robotics at young ages, so members are primed for the Robostangs before they even matriculate into the team. On the Robostangs, senior members train them through "New Member Bots," simulating competition

seasons and competing at Week 0. We pair this with comprehensive cross-functional training programs, documentation on past innovations, and an integrated alumni network to ensure sustainability.

Describe your team's innovative strategies to recruit, retain, and engage your sponsors within the past 3 years

Our team recruits and maintains sponsors with a personal and interactive relationship. Uniquely, we invite sponsors to our competition and offseason showcase, where we showcase our robot and IMPACT presentation to show the products of their sponsorships. We send out quarterly newsletters to update sponsors on progress and support their events, such as Siemens' MiA. We recruit statewide sponsors at the Student Technology Showcase in Lansing and community sponsors at the Northville STEM Fair.

Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.

After COVID, our team had a serious experience shortage. Restrictions had prevented us from accessing the shop in any meaningful way for the 2021 season, so we effectively lost two seasons worth of experience. This prevented us from meeting our goal of qualifying to the world competition. To address this issue, we started forming concrete training plans, such as a comprehensive software curriculum and our new mechanical handbook. We are hoping to emulate our past success to restore our prestige.

Describe your team's goals to fulfill the mission of *FIRST* and the progress you have made towards those goals.

In addition to providing countless opportunities in STEM and mentor-based student-led initiatives as previously stated, our team strives to emulate the last clause of the first mission: self-confidence, communication, and leadership. For example, we host interview-building workshops, leadership development seminars, and attend conferences to build networking skills. Working with our sponsors, we invite industry professionals to mentor our members and help them succeed professionally.

Briefly describe other matters of interest to the *FIRST* Judges, including items that may not fit into the above topics. The judges are interested in learning about aspects of your team that may be unique or particularly noteworthy.

Every year, we publish a scouting app, helping teams record and analyze other teams' performance. Our previous app had 145 downloads from 17 countries. To share the power of scouting with more teams, our 2023 app is being developed on both iOS and Android, so we project over 250 downloads. In partnership with the app, we developed a predictive reinforced machine learning coach app and a webscraper that downloads data from The Blue Alliance and aggregate real-time statistics using linear algebra.

Essay

FIRST: FIRST ENABLES THE ROBOSTANGS TO IMPACT THE WORLD In 2001, the Robostangs built a community of students united in their passion for FIRST and desired to make a positive impact in the world. Today, we fulfill our purpose by using FIRST to electrify our surroundings. Our 79-member team specializes in 10 subgroups: 5 business and 5 build. We are a student-led team ready to inspire other students and promote a love for creativity and innovation, setting our team apart. Collectively, the Robostangs are CHARGED UP to implement FIRST values to create a meaningful impact in our community.

INSPIRATION: FIRST MOTIVATES US TO INSPIRE YOUTH THROUGH OUR IMPACTFUL PIPELINE PROGRAM After understanding the impact of FIRST on our team, we developed the Northville Robostangs Pipeline Program to support all FIRST programs in our community. This program exists to engage young students with FIRST to use STEM in making a difference. The Robostangs' pipeline program has a total of 207 students and 28 teams. In FLL Discover, we started and mentored 2 teams in this new program with 18 students to introduce them to FIRST. We continue to inspire students with our FLL Explore program. We started and mentored 15 teams with 94 total students, increasing membership by 56% in the last year. The Robostangs have run the FLL Explore Expo, a one-of-a-kind 12-week program with 201 students and 35 teams across Michigan annually since 2012. The expo encourages involvement with the FIRST community to constitute the first half of our pipeline program. For the past 12 years, the Robostangs have run Robocamp, a week-long camp introducing students from 4th through 8th grades to FIRST robotics and STEM. In 2022, 43 students attended and developed their own FLL Challenge robot. Many continue to pursue their exposure by joining the FIRST Pipeline following Robocamp; in fact, 33% of the current Robostangs have attended Robocamp. FIRST inspires us to extend our mission toward the youth through FLL Challenge and FTC. This year, we started 4 FLL Challenge teams, including 3 rookie teams. From our mentorship, FLL Challenge 52448 qualified for the world competition. We also assisted their development by renting EV3 kits and donating game fields. Additionally, the Robostangs ran a coaching workshop to assist new FLL Challenge and FTC mentors. In FTC, the Robostangs started and mentored 7 teams including 4 rookie teams. We oversaw their design, mechanical, and software development. Our FTC teams benefited from our mentorship greatly, with 2 teams progressing to playoffs at the state competition. FTC 16671, the Broncobots, was captain of the winning alliance at the state competition and are currently preparing for the world competition. Three of the teams, FTC 19940, FTC 16671 and FTC 21340, also won the Inspire Award at their district competitions. 31% of our FTC members continue to pursue their passion for FIRST by joining the Robostangs.

RECOGNITION: FIRST ENABLES ROBOSTANGS TO BE RECOGNIZED FOR THEIR IMPACT FROM OUR SMALL NORTHVILLE COMMUNITY TO WORLDWIDE RECOGNITION In our community, the Robostangs have recognized graduating Northville seniors who make a STEM impact with two \$548 scholarships for the past 10 years. Furthermore, we display our team to our community through events like our Offseason and Competition Showcases. This year, we started the Offseason Showcase with 100+ people in attendance to display our events. We presented Robocamp, UNIFIED Robotics, and our off-season robot, displaying our progress in the 6 months prior. Beyond our local community, we have annually presented at the Student Technology Showcase at the Michigan State Capitol for the past 5 years to advocate for FIRST and STEM to state legislators and industry leaders. Northville Public Schools and state representatives have recognized our robot and our outreach events. Globally, Robostangs alumni make an impact inside and outside of FIRST. Within the last 3 years, 89% of Robostangs alumni furthered their education in diverse STEM undergraduate programs. Robostang alumni are sought out for internships and recruited for jobs by renowned companies like Microsoft, Google, and Tesla. Robostangs take FIRST with them wherever they go, whether being active members in the FIRST Alumni Mentor Network, working with the Michigan Engineering Zone (MEZ), volunteering at competitions, or mentoring local teams. For example, Jack Ferguson is a leader of MEZ and 2016 Robostang alumni. He continues to use the lessons he learned as a Robostang to mentor FIRST

students throughout the state. Robostang alumni take their developed skills to the next level, using their passion for STEM to impact the world positively.

SCIENCE AND TECHNOLOGY: FIRST EMPOWERS THE ROBOSTANGS TO DEVELOP THE NEXT GENERATION OF LEADERS WHO MAKE AN IMPACT IN SCIENCE AND TECHNOLOGY

Alongside our community impact, we strive to have a scientific and technological impact. New members are challenged to push boundaries, as every year they are tasked to create a robot to compete at Week 0 and off-season competitions. This allows them to simulate an FRC build season. This year, our new members are building a competitive bot to play CHARGED UP and a soccer shooting bot for future outreach events. We also develop a scouting application based on the current FRC game. We use Tableau and Android Studio to develop this application, which is available on the Google Play Store. This year, we have developed an iOS application as well. This app is not only beneficial to us but also beneficial to other FRC teams. Our previous app had 145 downloads from over 17 countries. We hold workshops to energize others and challenge their creativity and problem-solving skills. We ran a virtual coding workshop to teach elementary students EV3 programming. The Robostangs have run and hosted design workshops at the start of the build season, familiarizing our members and members of other teams with the design process and CAD software. Perhaps our most impactful workshop is the Artificial Intelligence (AI) Workshop. Cognizant of the importance of AI in robotics, we reached out to an MIT Professor to develop an engaging 3-hour seminar regarding the topics of Robotics and AI. We encouraged the entire FIRST community to get involved in this event, and 125 people from over 10 different FRC teams attended the event, with many others watching it afterward. Robostang members and mentors have also worked with the Northville Public Schools planning to open STEM centers at every school across the district. With a 10 million dollar bond dedicated toward developing collaborative spaces, we are fostering STEM and robotics interests throughout our community. The Robostangs started workshops with Girl Scouts and Boy Scouts. For the past 5 years, we partnered with Google to assist 2 annual Google Girl Scouts events in Ann Arbor. Additionally, with Girl Scouts Heart of Michigan, we ran and hosted multiple Girl Scouts events, where scouts earned 3 robotics badges after learning about STEM. This year, we took our program statewide by running 3 new programs and starting a Boy Scouts program. Over 110 scouts attended, sparking a new interest for FIRST among children in STEM. In 2017, the Robostangs started Project India to empower students internationally. We started and mentored 4 FLL Explore and 4 FLL Challenge teams in Baroda, Hyderabad, and Coimbatore. However, we had to pause due to the COVID pandemic. This year, we restarted our program in India. Along with the teams above, we are working with a foster home to start and mentor an all-girls FTC team, FTC 22723, in Pune, India. Through all these endeavors, the Robostangs continue to build the next generation of leaders in science and technology.

FIRST VALUES INSPIRE ROBOSTANGS TO CREATE A MORE INCLUSIVE STEM FUTURE

As members of FIRST, we learned that increasing access to resources for the greatest number of students should be at the forefront of our mission. Therefore, we made it our core effort to increase diversity, equity, and inclusion in STEM by reaching out to people who may otherwise not have access to the resources we do. We have provided exposure and basic engineering education to homeschooled and displaced students at the Palestra Homeschool Facility since 2019. We teach students the FIRST core principles and mentor them in building their own LEGO bots. They learn important STEM skills, allowing them to pursue various careers. The Robostangs have started the first UNIFIED robotics program in partnership with the Special Olympics of Michigan to provide over 200 intellectually disabled students an opportunity to interact with STEM. The students worked together weekly with intellectually disabled students, guiding them in developing their sumo bots and EV3 code. To increase our reach and make our program sustainable, our team has expanded our UNIFIED programs to FRC 302, FRC 503, FRC 3536, and FRC 7174 at our very own competition. As the host in 2022, the Robostangs welcomed over 130 students from 9 teams to our competition, expanding from 50 students in 2020. Students competed with their creations and partook in

activities and games, creating valuable memories for Robostangs and students with intellectual disabilities alike. After working with the athletic programs in our district, Northville High School was awarded the UNIFIED Champion School Award, and we now receive funding for running UNIFIED programs. We are determined to expand UNIFIED Robotics in Michigan and globally with the platform FIRST has provided us, continuing to give opportunities to those who may not receive them otherwise. Using the resources and initiatives we developed, the Robostangs are ready to not only expand the reach of our impact but also provide the whole world with the opportunity to create their own circuits and energize tomorrow's brightest minds. By adapting FIRST's mission, we are creating a promising and inclusive future STEM world. ;

