FIRST Impact Award - Team 5338

2023 - Team 5338

Team Number

5338

Team Nickname

RoboLoCo

Team Location

Leesburg, VA - USA

Describe the impact of the *FIRST* 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 *FIRST* programs as mentors/sponsors.

Through RoboLoCo, community members gain leadership skills, a passion for STEM, and discover new opportunities. Within our team, 100% of our members graduate and attend college, with over 90% pursuing STEM majors, thanks to exposure from RoboLoCo. Since 2020, 40 students have graduated! Our alumni's passion for FIRST also continues after graduation. In 2020, a former member mentored FRC 125 (NU-TRONS) at Northeastern University. In 2022, another team alum returned to mentor RoboLoCo.

Describe your community along with how your team addresses its unique opportunities and circumstances.

RoboLoCo is based in Loudoun County—a rich and diverse community with 96 schools, 81,000 students, and 427,000 residents, making it Virginia's fourth-most populated county. Despite a high emphasis on STEM, many educational disparities continue to persist. RoboLoCo aims to increase the equity of access to STEM programs in Loudoun County by introducing students to robotics at a young age, starting teams, and helping underserved groups in government-funded programs and our 8 Title I schools.

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?

RoboLoCo spreads FIRST's message by increasing access to STEM. To scale our impact, we started a STEM advocacy podcast, Robocast, and a nontechnical resource bank, FIRST Steps, for FRC teams. Living near D.C., we meet with politicians (ex. Secretary of Education DeVos) and school administrators to advocate for increased STEM funding and start FIRST teams. We measure our impact by the continuity and growth of our outreach, from 2 years of Robocast to 5 years of NAC to 9 years of STEAM nights.

Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

Our team members strive to make a difference in the FIRST community and beyond. Ethan was a 2022 Dean's List Winner and Olivia was a FIRST Chesapeake Women in STEM Scholarship Winner. Both support FIRST by hosting/volunteering at workshops and competitions. Shruthika and Anya were SASA interns who organized the 2022 National Advocacy Conference, and Shruthika continued this year. Shalini used her experiences and Core Values to start InteGirlsDerived, a non-profit introducing STEM to young girls.

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

RoboLoCo mentors Loudoun County's second active FRC team, #9076—The Thunderbolts. We shared our resources (workshop slides & CAD models) and mentors, met with their leaders, invited them to Kickoff to brainstorm strategies, and co-hosted an FLL Challenge Tournament. We have hosted two FLL Explore Expos and started/are mentoring two FLL Explore Teams. We have handed out 250 FLL & FTC "Cheat Sheets" to parents, teachers, and administrators to help them start FIRST teams at their schools.

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?

RoboLoCo aims to be a community leader by opening the door to STEM involvement. We have hosted 6 STEAM Nights, 2 Hours of Code events for students at Title I schools, and organized workshops at VEX tournaments/hackathons to reach 1600+ individuals. We launched Robocast to share stories of FIRST teams/alumni/volunteers and STEM professionals to increase awareness about gaps in STEM opportunities & education. It is available on 4 platforms. The first season received 200+ listens in 3 months.

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

RoboLoCo has partnered with educational organizations like Bricks4Kidz, PROPEL, LEVEL UP, Head Start, STEP, and primary schools to spark early interest in STEM for ~1000 children, especially in underserved communities. We have partnered with teams like FRC 9076, 8726, 1629, and 4400 to share opportunities/resources for the greater FIRST community through Robocast and FIRST Steps. Partners like our school system, Janelia, and BAE Systems support us with supplies and funds to grow our efforts.

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

Regardless of skill, we host preseason workshops to build team knowledge & hands-on experience and help others by uploading them on YouTube & FIRST Steps. We embody our name, "Robotics - Loudoun County" by including students from 15/18 high schools and promote Women in STEM with 49% female members & 70% female leadership. We wrote an engineering-themed picture book that was translated into Spanish and read to 380 underprivileged preschool families in Loudoun County Head Start and STEP.

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

RoboLoCo believes impact comes from within, so we connect members to our programs early on. Members attend mandatory non-technical & technical workshops to learn about all aspects of the team and complete one off-season project. Our team structure ensures sustainability, with team leaders being assisted by younger project managers and encouraging the involvement of new members in specific initiatives (ex. podcast production or intake design) to increase responsibility and leadership experience.

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

We recruit sponsors through cold emails, cold calls, and in-person meetings to inform potential sponsors about becoming a contributor. RoboLoCo develops an annual sponsorship packet detailing our team efforts, ways to contribute, and a tiered benefits system. We have retained and engaged sponsors through our biweekly newsletters, showcasing at company events, and inviting them to competitions and end-of-year celebrations. We also plan to highlight their involvement through features on Robocast.

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

During the pandemic, RoboLoCo lost many sponsors, and as of this season, we are restricted by county policies on how we can recruit sponsors. Because of this, our goal is to establish more stable and long-term sponsorships/partnerships to ensure financial security and team sustainability. We are currently working to reach out to organizations through our school system, alumni, mentors, and parents, establish a streamlined grant application system, and develop a regular fundraising schedule.

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

For us, a culture of change means advocating and innovating ways to enter STEM. By expanding Robocast and FIRST Steps, our collaborative programs, we share knowledge and connect FRC teams. We hope to combat equity gaps by partnering with local institutions to bring robotics to underserved schools, starting a resource center for FLL teams, and increasing diversity by supporting girls in our outreach. Ultimately, we want to be a hub for opportunity in Loudoun County to make STEM available for all.

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.

“We are more than a FIRST team, we are a community.” - Gerald the Safety Lemon. RoboLoCo’s mascot, a foam lemon found at the NOVA Maker Faire, has been RoboLoCo’s unifying force. Gerald taught us the importance of emphasizing nontechnical and technical skills, Gracious Professionalism, and caring for the alliances we build. He inspired us to leverage our position as one of our area’s only FRC teams to become the “Gerald of Loudoun County”, unifying everyone through STEM to create future leaders.

Essay

When life gave us a lemon, we made connections.

In September 2019, while volunteering at Northern Virginia Community College's annual Maker Faire, RoboLoCo members stumbled upon a small foam lemon lying by the sidewalk outside, naming him "Gerald the Safety Lemon". Since then, Gerald has grown to become our unifying mascot.

Over the past three years, RoboLoCo has worked to use its position as one of the original FRC teams in Loudoun County to become the "Gerald" of our community, innovating ways to connect students from diverse backgrounds to make a difference.

RoboLoCo's connections stem from within our team. Prior to the COVID-19 pandemic, we strongly focused on the technical aspects of FRC. In 2020, noticing a lack of nontechnical involvement, we began to adopt a holistic approach by emphasizing business, outreach, and design in addition to manufacturing and programming. Members also participated in virtual nontechnical and technical rotations. Our workshops and projects connected people with different skill sets and created a new pathway for students with diverse interests to contribute to the team.

By 2021, our interdisciplinary model was officially integrated into the team. Four subteams - mechanical, software, business, and creative - were created to ensure all members had the tools to succeed in the build season. We required members to attend a series of technical and nontechnical workshops, which provided instruction on foundational concepts and gave students the opportunity to apply their knowledge to hands-on projects. That year, RoboLoCo also reorganized its leadership to consist of a president, two leads for each technical subteam, one lead for each nontechnical subteam, project managers, and officers for safety, strategy, and social media.

These internal changes were expressed in our team's growth, particularly in our recruitment. Last season, we expanded our efforts by hosting booths dedicated to each subteam at six after-school open houses, club fairs, and interest meetings. In 2021, we recruited a record of three mentors and 120 members. Over 100 students participated in preseason workshops this year, with 15 of 18 high schools in Loudoun County represented. However, RoboLoCo understands that recruitment goes beyond membership. As a part of our focus on increasing diversity within STEM fields, we support women involved in FIRST and participate in events such as the FIRST Chesapeake Women in STEM panel. Furthermore, this is exemplified in our team demographics, as 70% of our leadership and 49% of our total team is female.

We continuously use our resources to improve access to STEM education in Loudoun County. This is reflected in all the connections RoboLoCo builds, many of which go beyond our team. This past fall, our creative and mechanical subteams wrote Gerald and His Robot, a picture book that showcases the adventures of Gerald the Safety Lemon! The book highlighted the importance of Gracious Professionalism and the function of motors in a fun and easy-to-understand manner. We partnered with Loudoun Literacy Council, Wolf Trap National Park for the Performing Arts, and Loudoun County Head

Start and STEP (federal- and state-funded preschool programs for underprivileged families) to host four STEAM-themed “Book Parties”. To foster interest in STEM at an early age, we not only read our book, but also gave children the chance to drive our robot, explore its features, held a coloring station, and gave resource guides to parents with free STEM activities to take home. Since many of the families were non-native English speakers, we worked with a native Spanish speaker to translate the book and read it aloud. In total, our Book Parties reached over 380 children and families! However, cultivating a passion for STEM extends further than inspiring young children. RoboLoCo uses the relationships we built to create an environment where students can pursue science and technology through high school and beyond. For the past two years, we’ve partnered with the Academies of Loudoun’s Computer Science Honor Society to host an Hour of Code event for Level Up! and PROPEL—two county-wide programs that introduce elementary students at Title I schools to STEM learning opportunities. In May 2022, we collaborated with Bricks4Kidz to mentor two FLL Explore teams including students from Title I elementary schools. Beyond these long-term partnerships, RoboLoCo consistently looks for ways to spread STEM throughout its community. In June of 2022, we were presented with the opportunity to speak to school board administrators and teachers at the annual Inspire Loudoun conference. We discussed the importance of establishing a comprehensive STEM curriculum and provided resources for starting up FLL and FTC teams at schools. Whether it’s sharing the benefits of participating in robotics at the Stone Springs Hospital Center’s Robotics Takeover or demonstrating at STEAM nights at six elementary and middle schools across Northern Virginia, we’ve been able to connect with over 1,650 students, educators, and professionals.

On and off the field, RoboLoCo works with the alliances formed in FIRST to drive change. Despite the increasing prominence of STEM within Loudoun County, we have been the only active FRC team for the past 9 years. However, that changed over the summer. Our veteran members began mentoring FRC 9076 Thunderbolts—Loudoun County’s newest FRC team. We have met with their leadership and provided guidance on FRC-specific CAD, programming, and electrical processes, supplied information for establishing outreach programs, and helped manage logistics. Additionally, we shared our mentors and resources with the Thunderbolts and invited them to our Kickoff event so that we could brainstorm game strategies together. RoboLoCo also helps with other FIRST programs. In November of 2022, we hosted an FLL Challenge Regional Qualifier tournament, which saw 15 teams in attendance. Last season, RoboLoCo also collaborated with the Academies of Loudoun and Bricks4Kidz to host two FLL Explore Expos, building on the FLL workshops that we’ve organized since 2019, which have helped over 40 teams.

Even outside of competitions, we continue to look for ways to bring FIRST teams together. RoboLoCo advocates for improved educational equity by lobbying for the increased funding of after-school STEM activities, particularly in underrepresented areas, under ESSA Title IV Part A. For the past five years, our members have attended the National Advocacy Conference (NAC) on Capitol Hill to address this issue with politicians such as VA-10 Representative Jennifer Wexton, Senators Tim Kaine and Mark Warner, and former Secretary of Education Betsy DeVos. We became a member of NAC’s Advisory Council in 2018 and utilized this position to encourage other FRC teams from across the nation to become involved. Additionally, in 2022, two of our team members interned under NAC’s parent organization SASA and helped organize the conference. Through this event, we used our platform to share our passion for science and technology with others and form relationships within the political system to help advance STEM accessibility.

Inspired by NAC’s mission, RoboLoCo launched Robocast, an educational podcast focusing on

advocacy and student involvement within STEM programs. On Robocast, we interview professionals and FIRST alumni/volunteers, who provide insight into their experiences and advice for students interested in pursuing a STEM career. The podcast has also given us a unique opportunity to connect with FIRST teams across the world, increase awareness of gaps in STEM equity and education, and provide a global platform for them to share the different ways in which they have spread STEM in their communities. Teams featured on Robocast include FTC 11112 (RoboLords) from Virginia, FRC 1629 (GaCo) from Maryland, FRC 1108 (Panther Robotics) from Kansas, and FRC 4400 (CERBOTICS) from Mexico. Two engaging seasons of Robocast have been uploaded onto Spotify, Google Podcasts, Apple Podcasts, and Youtube. Within three months of our first season's launch, we received over 200 streams!

We carry many of the relationships we have built through Robocast into our other virtual initiative, FIRST Steps. After realizing that there were no comprehensive resources to help teams with the marketing, outreach, finance, and safety aspects of FRC, FIRST Steps was designed to be a "one-stop-shop" for rookie and veteran teams to learn about these topics and grow their impact. The collaborative database includes workshop slides and video recordings, free templates for sponsorship packets, resources to help with fundraising and acquiring grants, and outreach activities. Through blog posts, FIRST Steps also highlights advice from rookie and established teams alike, including FRC 4400, CERBOTICS, and FRC 8726, The CryptoHawks. To further develop FIRST Steps, we plan to add design resources about team branding, team imagery, and guidance on promoting team safety.

Connections are at the core of everything RoboLoCo does. Whether it's through creating a holistic team structure, introducing students from underrepresented areas to robotics, or building partnerships with organizations in Loudoun County and FIRST, we aim to make opportunities in STEM inclusive and accessible. With every event held, lesson taught, and alliance formed, we multiply our impact on those around us. Looking ahead, we plan on expanding our outreach by inviting more teams to share their vision for STEM equity on Robocast, continuing to update FIRST Steps, and establishing a resource center for FLL teams in the Loudoun County area. Together, we connect, include, and innovate. Together, we are more than a FIRST team, we are a community.;