

Chairman's Award - Team 649

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2022 - Team 649

Team Number

649

Team Nickname

MSET Fish

Team Location

Saratoga, California - 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.

Students gain leadership, communication and interpersonal skills. 3 of our mentors are FIRST alumni, who use their experience to better the next generation of FIRST participants. In the past 3 years, 100% of MSET students have graduated high school, and 99% pursued higher education. More than 85% major in STEM in college. Because FRC has given them advanced CAD/CAM and hands-on machining skills, students also pursue STEM work opportunities and internships even while still in high school.

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

In our community, a few miles can mean the per capita income difference between \$93,627 and \$27,703. We close this sharp gap in wealth and income by developing curriculum and hosting 4 week courses, like Home Science Experiments and Python for over 20 children at the Santa Teresa Library and Blackford Elementary, a Title I school. Machine parts for FRC teams such as 972, 2813, and 3501. Spread FIRST through robot demonstrations at MakerFaire, Sunday Friends, and the Rotary Art Show.

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?

Emphasize STEM accessibility by: Partnering with local schools to set up FLL teams, expanding FIRST and making FRC-related skills available to the wider community. Effectively advancing FIRST's message by partaking in a TV educational documentary program for South Korean audiences. Measuring success through our reach □ 11 teams mentored, 500+ hours of mentoring, 19 GoBabyGo! children impacted, four Scout troops, & 15+ meaningful partnerships formed.

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

Team members demonstrate their commitment to strengthening and spreading FIRST programs by devoting 1000+ hours to outreach events annually, including hosting our seven year-standing Saratoga Qualifier and FLL Junior Expo, mentoring FLL teams, and spreading STEM knowledge to underprivileged communities. Senior members create a supportive, inclusive atmosphere for younger teammates to flourish. Actively mentor and train them, inspiring them to practice gracious professionalism and cooperation.

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

-Over the past three years, we have started and expanded our FLL mentoring program from 3 to 11 teams by partnering with all three local elementary schools, a Girl Scouts troop and a private team, who made it to regionals twice. -Meeting biweekly we have: assisted & mentored the students by setting weekly goals, providing technical feedback on the Innovation Project, and empowering everyone to get involved. Fostered tight-knit relationships with the students, parents and team coaches.

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?

Developed and led two six-week virtual summer workshops for FLL students, igniting their curiosity in STEM at a young age and inspiring them to join our FLL programs. Organized summer camp at Cityteam, a youth organization based out of San Jose, and Bright Futures, for gang impacted teens, where we helped them build basic robots. Before attending, several students were not considering STEM-related careers. With our guidance, the students were inspired to pursue engineering activities.

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

AbilityPath, a physical therapy organization Established GoBabyGo! NorCal chapter. Modified 19 toy cars for handicapable children. FLL Developed connections with Argonaut Elementary's leadership. Leveraged this to expand our program to 3 elementary schools. Girls Education Vikalp Sansthan, an organization aiming to eradicate child marriage via education. Leveraged our work to partner with the WeEducate Foundation, One Billion Literates Foundation & Shadhika.

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

Through our global partnerships, our work promotes diversity. Due to COVID-19, the Vikalp girls' schooling stopped. Created 49 conversational English & math videos, reaching 600+ students. Produced computer-skills videos featured in Shadhika's toolkit for 80 girls. Videos enabled the girls to continue their education, giving them an equal pathway to achieve their potential. Within our team, we ensure that girls are recruited & are able to build their own community with constant mentor support.

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

Even as underclassmen, all students have the opportunity to drive initiatives, ensuring that when seniors graduate, they can lead programs and sustain established connections. Each initiative is assigned a team lead and core group. For example, GoBabyGo! has a core team responsible for planning, construction, & delivery of the vehicles. The following year, new leads are chosen from the members of that team. Detailed documentation on the car modification process to aid future endeavors.

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

Attend sponsor events, where we present to Apple, KLA, and Rotary Club of Saratoga to demo our robot and raise awareness about our outreach. Have sponsors speak at our school, including an MSET alum, from Intuitive Surgical, who discussed the robotics work happening in the medical field. During competition last year, sent a biweekly newsletter, the "The MSET Catch," to our sponsors to maintain and nurture relations Recognize our sponsors on our robot, t-shirts, and banner.

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

We strive to improve our team organization & structure by: Upperclassmen prioritize hands-on trainings for underclassmen during off-season Improved ratio of upperclassmen to underclassmen from 5:1 to 2:1. Documentation written as teaching aid. Concrete goals Take time to make team & subsystem goals. Constantly refer to these visions when making decisions to determine whether they align with overall strategy. Team communication Use spreadsheets for timelines. Weekly team meetings for updates.

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

MSET's mission is to foster a generation of leaders and innovators with an emphasis on equal opportunity for all. We have focused on mobility and equal representation. GoBabyGo! Applied our technical skills to solve real-life problems in our community, helping the underserved. Girls' Education FLL teams Started and mentor two girls teams Actively encourage girls to enter STEM at a young age Education in India Videos reinforce girls' self-worth and uplift them to follow their dreams.

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.

Operational Style: Various leadership roles, all catered towards specific aspects of FRC. FRC Team lead spearheads organization. Sub-leads lead their respective groups (Hardware, Software, Outreach). Multiple subsystem leads within outreach allowed for rapid expansion of initiatives. Primarily student run: - Team lead is elected. - Training and outreach events predominantly run by students. -Team strives to capitalize on the opportunities that arise to make splashes in our community.

Essay

Diving into the ocean of FIRST, Team 649 MSET Fish has inspired the next generation of STEM leaders, harnessing the power of technical expertise and community outreach to create a big splash by promoting FIRST's core values, facilitating innovation, and catalyzing lasting impact.

The Team, Mission, & Values:

Team 649 first began competing in FIRST in 2001 as Saratoga Robotics Team (SRT). Though SRT hit some waves, it was reborn as the Mechanical Science and Engineering Team (MSET) in 2010. Our club has grown from 10 students to an unbelievable 100, with 55 in the FRC program and 45 spread across three FTC teams, reviving the engineering community in Saratoga and embodying FIRST's ideals □ Gracious ProFISHionalism and CooperFISHion.

Staying true to our values of a student driven culture and continuous improvement, students are placed into environments that encourage them to hone their leadership and teamwork skills. Through student-led retrospectives and weekly technical progress meetings, students lead our team's initiatives and set team and subsystem goals. This allows us to foster open communication and pursue purposeful endeavors that maximize impact.

To heighten our effISHiency and sustainability, we have appointed underclassmen subleads and have redesigned our training structure to give them hands-on experience during the offseason. As a result, active student participation on the robot has skyrocketed.

We constantly strive to align our outreach initiatives with our mission of fostering a generation of leaders and innovators with an emphasis on equal opportunity for all. Propagating this mission to the rest of the team has enabled us to increase the scope and number of our projects despite COVID-19.

By nurturing an inclusive atmosphere and forging meaningful connections with local and global communities, we work towards our mission to drive transformational change on FIRST teams, the FIRST community, and beyond.

FIRST Involvement:

Team 649 is a proud contributor to the FIRST community. For the last seven years, we have hosted a FTC qualifying tournament at our facilities, and our members have helped organize, set-up, and staff the event, which bring in 400 attendees. In 2019, we also hosted the FLL Jr. Expo.

This year, we expanded our FLL mentoring program. Since 2018, we have started, assisted, and mentored three teams. In 2020, we also mentored and assisted a fourth team, who qualified for the Northern California Championships and was FIRST Alternate at the Northern California Innovation Expo. This year, we grew our program to 11 teams, which spans all three local elementary schools and a Girl Scouts troop, aiding 100 students with robot design and the innovation project. Since the program's inception, we have collectively accumulated 500+ hours of mentoring with FLL teams.

Along with mentoring, we have made it our goal to provide learning experiences for students regardless of challenges that arise. In 2020, our season and outreach initiatives were cut short due to COVID-19. Nonetheless, we pivoted by hosting a six-week virtual software camp to prepare students for the FLL competition season. Because of its efficacy to engage students, we expanded the program to include hardware and software in Summer 2021.

To extend the effects of our splash, we host multiple robot demonstrations every year at Sunday Friends STEAM Fair and Los Gatos Rotary Club □ to name a few □ and hold assemblies at all of our local schools. Not only does this help with our team's direct recruitment, but it also increases FIRST awareness and inspires younger students to pursue STEM and FIRST.

Local Outreach:

From workshops at our local library to extensive STEM programs, we have spread our fins across our local community.

At Saratoga Library, we ran several programs called Dot & Dash, which uses robots to teach children basic programming logic, and "Wonky Wiring" workshops, introducing them to the world of digital electronics.

Last year, we hosted three four-week virtual workshops at the Santa Teresa Library and Blackford Elementary for over 20 students. The workshops were geared towards elementary school students, conducting home science experiments to teach scientific principles in a fun, interactive way and the basics of Python coding. By leading these programs, we sparked their interest in STEM at a young age.

Essay - page 2

We are leveraging our Python curriculum to build an intensive after-school engineering program for Breakthrough Silicon Valley, a nonprofit that provides academic support for first-generation college students, and Latimer Middle School, a Title I school. We hope to create lasting change for these students to enable them to reach their full potential.

Finally, we hosted a program to help Scouts BSA troops 581 and 582 get their Robotics Merit Badge. Through our arduino curriculum, we have designed an affordable means to receive the badge, furthering our mission. Additionally, we donated our curriculum to FRC Team 2813 to grow this project.

Along with the robotics merit badge, we have designed a software curriculum and are aiding troops 325 and 2457, about 30 students in total, receive their Programming Merit Badge.

Going beyond Saratoga, in 2019, we hosted a robotics summer camp at Cityteam, a youth organization in San Jose. With our guidance, the students were inspired to become engineers, opening doors to the possibilities the students had never known before. With the nonprofit Bright Futures, we held a workshop to introduce robotics to youth impacted by gang violence. In the beginning, the teenage students were extremely reserved. However, at the end, their intellectual curiosity was ignited, inspiring them to pursue similar opportunities in the future.

Sponsors:

We strive to foster, retain, and engage our sponsors by attending their robotics events. For example, we have visited multiple sponsors' sites, including Intuitive Surgical, Tula Technologies, and Apple. For the last two years, we have presented to KLA and Saratoga Rotary, discussing our experiences in FIRST and the value of FIRST in our education, while expressing our gratitude for their support of the FIRST community and our team.

In June, at the SASA National Advocacy Conference, we met with Representative Anna Eshoo's office as well as the offices of California Senators Alex Padilla and Dianne Feinstein to advocate for increased future funding on federal grants from the Student Support and Academic Enrichment (SSAE) program. The Congress members supported our request to pursue increased funding, and the FY22 appropriations bill approved in July funded SSAE grants at \$1.3 billion, a roughly \$85 million increase in the allocated budget. Through this experience, we acquired the knowledge necessary to be an effective advocate for STEM opportunities at the local, state, and federal level, and we're excited to use these lessons to take us to the next level.

Equity:

Mobility: In 2019, we partnered with AbilityPath, a local physical therapy organization, and founded the GoBabyGo! Northern California chapter. We have customized and retrofitted 19 toy cars and ATVs for toddlers with disabilities across the span of multiple events. One car was modified for children with poor limb and core strength who had trouble holding themselves up. Another was developed for toddlers learning to stand - the cars would move when the child stands and stop when the child sits. We enabled these adorable toddlers to move independently and socialize with their peers, thus creating equity.

To grow this initiative, we plan to collaborate with other schools and clinics to involve more teams in the journey as it has been such a rewarding experience to apply our technical skills to help solve a real-life problem. To this end, we developed instructional materials and videos to document the modification process to help FIRST teams.

Education for Girls: Through our international work aimed to support girls, we promote diversity and gender equity. In 2020, 649 partnered with Vikalp Sansthan, an organization dedicated to eradicating child marriage and empowering girls in rural India through education. Due to COVID-19, the girls' education had stopped, increasing their risk of child marriage and abuse. To date, we have produced 49 conversational English and math videos, reaching 600 Vikalp students across 18 learning centers. Additionally, we partnered with the WeEducate Foundation, which rehabilitates girls traumatized by sex trafficking, and the videos are viewed by 25 girls across two shelters.

Inspired to do more, we've actively sought greater opportunities to widen our impact by partnering with Shadhika, an organization affiliated with Michelle Obama's Girls' Opportunity Alliance. We created five computer-skills videos featured in Shadhika's toolkit for 80 girls, as part of Unicef's International Day of the Girl.

Despite language and distance barriers, our videos have enabled the girls to continue their education, uplifting them to pursue their own aspirations.

Finally, we've partnered with the One Billion Literates Foundation, aiming to increase literacy in rural Bangalore. Unfortunately, the teachers helping these students have limited English proficiency. We are modifying our videos and making quizzes to aid 60 teachers, allowing them to better teach over 4,500 students in 79 schools. By helping teachers improve their English, they can apply this lifelong skill beyond the scope of this initiative, creating a ripple effect.

What started as a splash, originating in our small space at Saratoga High, has now gained greater strength and momentum. From our work to elevate excitement in FIRST at local elementary schools, to our development of STEM virtual programs, to our initiatives that promote equity, we hope the waves leave an indelible impression on those we touch, transforming their inspirations into future innovations in the world.

