

Chairman's Award - Team 4451

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2022 - Team 4451

Team Number

4451

Team Nickname

ROBOTZ Garage

Team Location

Laurens, South Carolina - 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.

Since 2019, LDHS has an average graduation rate of 80% and only 49% of its alumni pursue a post-secondary degree. However, 100% of 4451 graduates earn a diploma and either seek a STEM degree or enter the STEM workforce. Our recent alumni are enrolled in Mechatronics(4), Mechanical(3) and Electrical Engineering, Biomedical Sciences, Biological Sciences, Computer Science, Physics, and Graphic Design programs. Three 4451/LDHS alumni are currently mentoring our team (2 mechanical & 1 electrical).

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

Economically, Laurens is significantly behind our more affluent neighboring counties. According to the 2020 Census: 19% of Laurens residents are living in poverty, Laurens residents per capita income is \$9,765 less than Greenville, Laurens has 5,742 fewer employer establishments than Spartanburg, Laurens % change in total employment is 6.9% lower than Anderson. 4451's mission is to aid the economic development of Laurens County by producing a highly skilled workforce to attract more industries.

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?

In addition to many community events, 4451 primarily spreads the *FIRST* message and inspires STEM exploration with our Hot Rod STEM Camp. Since 2014, our annual camp for rising 3rd-8th graders has resulted in 16,942 hours (705.9 days) of camp interaction. Since 2019, campers averaged 2,167.7 hours (90.3 days) per summer, including 2 pandemic impacted summers. Students participate in STEM challenges, listen to guest speakers, and take a field trip to discover how STEM is used in future careers.

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

After our school experienced multiple suicides over a 6 month period, leaders from ROBOTZ Garage and the LDHS Student Council established "Laurens Uni;ted." The purpose is to start a conversation among students about the importance of mental health. The semicolon represents that you, as the author of your life, have the power to continue your story. We expanded that idea into "Robotics Un;ted", and we work to build a coalition of teams that address the struggles of mental health.

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

4451 recognizes that South Carolina FRC teams need to come together to improve the performance of our teams on the regional and world stage. We are hosting a "Drop-In" scrimmage in our shop at LDHS for 8 teams (4 in the am and 4 in the pm) to collaborate and prepare for the upcoming season. This scrimmage will motivate teams to wrap up their build with enough time to work out mechanical and programming issues prior to their first regional. As the saying goes, "A rising tide raises all ships."

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?

The excitement around the success of ROBOTZ Garage has motivated our district to widen its STEM offerings. After the growth of our STEM Camp, the LCSD55 Department of Teaching & Learning began offering "STEM Saturdays" throughout the school year. The Project Lead the Way program also expanded to include Biomedical Sciences and Gateway to Technology. Our district saw an 84.7% increase in middle school students exposed to problem based learning (98 GTT students in '19 to 181 in'21).

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

The mission of the Laurens County Development Corporation (LCDC) is to advance economic opportunities resulting "in a viable future for all county citizens" making them a natural partner for our team. For the past 3 years, our interactions have included: LCDC sponsoring SCRAP 2021 and 4451 mentors included in the LCDC "Talent & Workforce Solutions Team" during the strategic planning process. Our team was spotlighted in the commercial advertisement "Laurens County: A Higher Opportunity- 2.0."

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

We began hosting "Girl Powered Garage" in October '19 (International Day of the Girl is celebrated in October) and continued in '21. Ten 8th grade girls from each of LCSD 55's middle schools spend the morning in our shop. Participants are introduced to 4451, participate in an activity, and interact with a female engineer guest speaker. In 2019 our speaker was in person, but in 2021 LDHS Alumni Rachel Griffin ('17) presented via Zoom from Omaha, NE where she is an engineering project manager.

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

Our partnership with Laurens County School District 55 safeguards a sustainable future for Team 4451. We are a recognized LDHS extra-curricular activity (our award banners hang in the gym alongside the athletic teams). 4451 has a mutually beneficial relationship with the PLTW, Welding, Automotive, and Building Construction CATE programs. Annually, we are included in the LDHS local plan for Perkins funds, and the LDHS bookkeeper provides financial oversight to monitor expenditures and income.

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

Our primary recruitment strategy is to target sponsors with a personal connection to our team. Companies who employ 4451 parents are the most generous and consistent sponsors (ie. BOSCH, Walmart, Michelin, Palmetto Air Solutions). We also emphasize the exposure received by sponsoring a team that competes in an average of 2.5 events/year, who regularly appears at promotional nights and festivals, works with 8 different afterschool programs, and hosts a STEM Camp averaging 73 campers a year.

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

We plan to expand the ROBOTZ Garage *FIRST* footprint by launching a FTC team. COVID-19 restrictions have prevented us from accessing our primary build space with BOSCH, and we've relocated much of our resources to the PLTW shop at LDHS. When team operations return to Fountain Inn, we will establish a FTC team on campus for students who struggle with the transportation to an off-site facility. A SWOT analysis brainstorming suggested adding a "Girls Only" FTC team to increase female participation.

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

Our 2022 theme is, "Moving Forward; Preparing for what is NEXT." Just getting students to the NEXT level isn't enough. ROBOTZ Garage wants to help students flourish by providing strategies and experiences in handling adversity. Our team prepares elementary/middle school students for STEM program success with HRSC. FRC prepares our team for success after graduation by requiring them to apply lessons learned in school. Our team doesn't use kids to build a robot, it uses a robot to build kids

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 Christmas, we partner with the LDHS NJROTC to hold a toy drive to aid the Laurens County Sheriff's "Christmas For Kids" program. In the past, we would host a competition between classes and produce a treasure trove of toys. In '21 we transitioned from quantity to quality. We challenged the LDHS students and faculty to work collaboratively to raise \$ to purchase a bike. Our school was able to donate 35 bikes and 28 helmets to the campaign and make the holidays merrier in our community.

Essay

FRC Team 4451's rookie season was in 2013, but our story really began in 1968 in the backyard of our lead mentor, Mr. Mike Bryan. It was there that Mr. Bryan's father, Mr. Jim Bryan, would gather the neighborhood kids and teach them how to repair Indian motorcycles, paint cars, and work on engines. The lessons learned were about more than the technical skills needed to overhaul a motorcycle or to "soup up" a car. Working alongside an experienced mentor, the kids learned that integrity, caring, and honesty were their most important tools. Mr. Mike wanted to recreate the learning environment he experienced as a child, but with robots. His dream became a reality with the creation of ROBOTZ Garage and establishing a partnership between the Apprenticeship Program at the Fountain Inn BOSCH/Rexroth plant and Laurens District 55 High School (LDHS). Introducing Laurens to FIRST forever changed the culture of our school, and created a legacy for which his father would be proud.

For many years, the unofficial goal of LDHS was to send as many students as possible to a 2 or 4 year college/university. The number of students enrolling after graduation, and the amount of scholarship dollars earned were metrics used by school, district, and state leaders to evaluate the quality of the education received by LDHS students. But those numbers did not tell the whole story. "We were doing a fairly decent job of sending students to 2 and 4 year schools." Says Rob Sheffield, FRC Team 4451 Mentor and LDHS teacher (1997-present), "The problem was that so many of our students were not prepared for the rigors of college life. They were on their own for the first time in their lives and ran into difficulties, only to return home after a semester or two." Therefore the motivation for ROBOTZ Garage's 2022 season theme is: "Moving Forward; Preparing For What is NEXT." For the past decade, our team has strived to prepare students to be successful when we leave our program by giving us tools and strategies to persevere when we face adversity. Yes, we want to better ourselves by attending a university/college/technical school/apprenticeship, but we need to be ready for the challenges when we get there. Not only are we working on ourselves, but we are also "Paying it Forward" by helping to inspire younger students in our district to be ready when they arrive at LDHS. And finally, our team has identified the importance of mental health in preparing us, not just academically but emotionally, for the obstacles that lie ahead.

HOW FRC TEAM 4451 PREPARES US:

As members of ROBOTZ Garage we gain valuable experience with the strategies we will need when we enter "the real world." According to the Battelle For Kids P21's Frameworks for 21st Century Learning, to be successful in work and life we need to be proficient in: Flexibility and Adaptability, Initiative and Self Direction, Social and Cross Cultural Skills, Productivity and Accountability, and Leadership and Responsibility. Each of those skills is reinforced through membership in ROBOTZ Garage and participation in FIRST Robotics Competition. What better way to experience flexibility and adaptability than through the iterative design process our team goes through each year to create a robot to play a new game? Our team's Student Leadership Team and Sub-Team Leaders structure give us first-hand experiences with management and reinforces the importance of responsibility and accountability. Our social and cross cultural skills are sharpened as we work collaboratively to identify team goals and determine the strategies to achieve them. Our mentors like to use the statement that "FRC Team 4451 doesn't use kids to build a robot, but we use a robot to build kids." When we come together to develop a strategy and then assemble our concepts into a functioning robot, we are engineering better versions of ourselves.

HOW FRC TEAM 4451 PREPARES OTHERS:

Our team is not just concerned with growing ourselves. We also want to make an impact in our community. The many outreach programs performed by ROBOTZ Garage allows us to do that. Our primary outreach program is Hot Rod STEM Camp (HRSC). What started as one hour workshops conducted at two local daycare facilities, has grown into a 4 day (8:30-5:00) camp hosted on the campus of LDHS. Our team members serve as counselors, and teachers (mentors and non-mentors) donate a week of their summer to share the love of STEM. Campers are divided into teams (named for the divisions at the World Championships) based on grade (3rd-5th and 6th-8th) and gender. The teams compete in STEM challenges throughout the week to win the "Garage Cup" (similar to the Hogwarts House Cup from Harry Potter). Students hear from multiple guest speakers, attend classes, and go on a field trip all based around the summer's theme. In 2022, our camp's theme will be "STEM Sports", and campers will learn how STEM is used in athletics. For the past three summers, we averaged 67 campers a summer (including 2 COVID impacted summers). Since the inaugural summer of 2014, 581 campers (an average of 73 per summer) have attended HRSC and spent 16,942 hours (705.9 days) developing a love of STEM. The percentage of girls attending camp has increased from 19% of campers in our first summer to a high of 54% in 2020. Over the past three summers, an average of 40% of our campers were females. We hope to further approach our goal of a 50-50 gender split by the 2023 summer.

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But our team's impact on younger students does not end with HRSC. We partnered with Laurens County School District 55's (LCSD55) Department of Teaching and Learning to incorporate FRC Team 4451 into all of our district's 21st Century After-School programs. We took our 2020/21 robot "Woodie Wagon " on a district wide tour of every LCSD55 elementary and middle school. The district started these after school programs to help the students identified as "the most affected by" the school closures and distance learning environment associated with the COVID-19 pandemic. We introduced these students to FIRST, our team, and conducted multiple STEM activities. Our team members guided the students as they programmed VEX-Go robots, worked together to tackle open-ended challenges, and were able to answer their questions about "Woodie Wagon." After the 2022 competition season concludes, we will undertake a "Spring Tour of Schools" to reconnect with the students and to further establish relationships. Our hope is that many 21st Century After-School students will become hooked on robots and join us when they reach LDHS!

HOW FRC TEAM 4451 ADDRESSES MENTAL HEALTH:

Our school and community were rocked in the Fall of 2018 when 2 current and 2 former students decided to take their own lives. Leaders from the LDHS Student Council and ROBOTZ Garage meet with the goal of "doing something" to address the mental health of LDHS students. Those student leaders were anxious about talking publicly about suicide, but the group decided that not talking about it was not working. They decided that afternoon to establish a student organization called "Laurens Un;ted" with the goal of starting a conversation at our school about the challenges of mental health. The inclusion of a semicolon in the name was inspired by the Project Semicolon movement. According to a July 2015 article in People Magazine, the project started by asking supporters of friends suffering from mental illness to draw a semicolon on their wrist and to post a picture on social media. "The semicolon was chosen because in literature a semicolon is used when an author chooses to not end a sentence. You are the author and the sentence is your life. You are choosing to continue your story." A school wide assembly was held to launch the organization, and the group conducted a school wide "Out of the Darkness Walk" in the Fall of 2019. That same Fall, Laurens Un;ted began to host an annual 5K race to raise money to fund a scholarship to assist an LDHS graduate who plans to major in a mental health field. ROBOTZ Garage believes the "Un;ted" message is so powerful that we chose to expand it to "Robotics Un;ted." We began promoting it at the 2019 Palmetto Regional, and continue to spread the message at every competition we attended. Each time we interact with other FRC teams, we invite them to join us in including mental health awareness in their teams safety strategy. Although we have encountered speed bumps with the suspension of in-person competitions in 2020, 29 teams from 5 states have expressed interest in joining the Robotics Un;ted community. Our Purpose: To educate students on how to respond and react if they, or someone close to them, encounters the difficulties of mental health.

Our Mission: To utilize the robotics community to spread the message that "IT IS OK TO NOT BE OKAY." Robotics Un;ted hopes to inspire students to start a conversation with their peers, in their communities, and among their family and friends that we all must endure the challenges of mental health.

Our Goal: We will stand together to meet the challenges of mental health and engineer a future where everyone believes that "YOUR STORY IS NOT OVER."

Mr. Bryan established this STEM family to prepare students to be ready when we leave LDHS and head out on our own. 2019 graduate Noah Shelton tells how FRC Team 4451 prepared him to major in computer science at Clemson University: "ROBOTZ Garage helped prepare me for the future by exposing me to a constructive, professional environment through which I developed the qualities and skills necessary to succeed in my personal life as well as my professional life; qualities such as teamwork, dedication, and leadership." Mr. Bryan's gift to this community will be this team and the message to keep "Moving Forward; Preparing for what is NEXT."