

FIRST Impact Award - Team 4593

2024 - Team 4593
Team Number
4593
Team Nickname
Rapid Acceleration
Team Location
Rapid City, SD - 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.
The impact of FIRST extends beyond the four years students may spend on our team. Those who have left continue to use what they learned from the program—from technical skills like CAD, soldering, and mechanics to interpersonal skills like cooperation, leadership, and self-confidence. Whether they return to mentor or leave to MIT, Microsoft, SpaceX, Amazon, the US Navy, VRC Metal Systems, or Caterpillar, we are proud of our alumni and of the way they continue to foster the spirit of FIRST.
Describe your community along with how your team addresses its unique opportunities and circumstances.
Our community faces a lack of STEM and FIRST opportunities. Being the only FRC team in a state with minimal science and engineering culture has proved difficult. However, this has given us a unique opportunity to become trailblazers in STEM. As a team we have created our own opportunities and impact. At first, we had to reach out to organizations to gain support or participate in their events, but through our outreach we have become the group to come to about anything STEM.
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?
Although we spread the FIRST message through our partnerships, the biggest impact has been through our members. Team members take initiatives to share the experience with their friends or others interested. Many female members volunteer for Women in Science (WISE) events to encourage girls to pursue their interests in STEM. Students also volunteer for STEM nights and recruit their old FLL teammates. We see our efforts pay off because of how we consistently gain 12-14 new members each year.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.
We aim to be leaders in our FIRST community. Every year we host an FLL scrimmage and volunteer at the FLL regional qualifier. During these events, we showcase our robot and teach students about the

next step in their FIRST journey. We also invite FTC teams to showcase their robot and teach students about options other than FLL and FRC, giving them an opportunity to interact with the FIRST community. Many team members who were past FLL kids also help us find creative ways to engage younger teams.

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

As the only FRC team in South Dakota, we have a responsibility to mentor and guide FLL and FTC teams by sharing the knowledge that we have gained. Over the history of our team, we have started, mentored, and assisted over 40 FLL teams, including introducing FLL-E into our state. We help these teams by providing mentors, parts, and guidance. Beyond FLL and FTC, we have also made great progress in our mission to help start a FRC team on the Pine Ridge Indigenous reservation.

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?

As a team, we strive to create a STEM environment that fosters leadership in our community. Team members have volunteered at Camp Invention, which is a summer design program. This camp encourages kids to explore science and technology through their own project. This gives kids the opportunity to lead and make ideas reality. As a result of helping with this camp, we get to see kids get inspired to pursue STEM; it even leads kids and parents to ask when the next event is.

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

For the last four years, we have had a close partnership with the Rapid City Rush. Every year we bring our robot on the ice and showcase it to hundreds, promoting STEM and FIRST in our community. Additionally, we are partnered with a local chiropractor to design a mechanism, called "Fit to Lift," that measures how much a person can safely lift to prevent injury and workman's compensation claims. Although this has been an ongoing project, we have made a fully built and tested prototype this year.

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

Our team actively promotes equity, diversity, and inclusion by fostering an environment where everybody, regardless of gender or race, feels welcomed and appreciated. By annually attending WISE at our local college, we have noticed an increase in women participating in and exploring future career paths in STEM (even outside of FIRST). These women, making up half of our team, have played pivotal roles in our team's success within the design, electrical, programming, and outreach sub-teams.

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

We ensure that we will continue to run effectively through our education and partnerships. Our pre-season curriculum guarantees that all students get equal opportunity to participate in all aspects of the team, from picking a drive train to our impact and outreach. The curriculum aims to engage new members to encourage their continued attendance. Additionally, we continue to engage our partners and sponsors by visiting them and showing appreciation and how their contributions benefit the team.

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

Our team develops long-lasting connections with great sponsors to ensure their support. Every season, our team visits local companies to share information about our team and encourage their patronage. We continuously show our appreciation by sending out hand-delivered "thank you" letters to each and every sponsor. At the end of the robotics season we hold a banquet for them, where we showcase our robot, provide food, and host a silent auction.

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

Our team continues to see growth in members but our funding remains roughly the same. Our sponsorships help us pay for the bulk of our robot but don't cover much of the excess expenses, and we can only take up to 12 students to our first regional. To improve upon this, we are working in partnership with our local chiropractor and manufacturers to make Fit To Lift a reality. Our team will get partial profit from this project to help provide kids with more opportunities.

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

One goal we have is to spread FRC across South Dakota. To achieve this, we are working closely with the FIRST FLL director who lives in the largest metropolitan area in the state. Even though he is 6 hours away from us, we have been hosting virtual meetings with him, school boards, STEM organizations, and businesses. We have been providing guidance on how to navigate starting and maintaining FRC teams, attracting sponsors and mentors, and how to use outreach to encourage STEM growth.

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.

Our team has one of the most impactful and close-knit teaching environments. Our presence within the community has invited many college students and team alumni to mentor. This has resulted in unique one-on-one learning, benefiting the team as a whole. Our team is also unique in how we engage students to learn through humor, by memes in our pre-season PowerPoints, or inside jokes that all students come to appreciate. This environment gives students equal opportunity to learn and feel welcomed.

Judge Feedback

Who/When

Feedback

Mar 09,
2024
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What about our team specifically stands out to you?

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay

“The bigger picture” involves looking beyond what is immediately possible and focusing on your overall successes, thinking about how your actions contribute to the end goal or outcome. Rapid Acceleration aims to look beyond what others may think is feasible and contribute to the bigger picture of science and engineering in our community. Through our outreach, partnerships, volunteer work, and student impact, we have become the epitome of STEM in South Dakota. RECOGNIZING ADVERSITY Rapid City, South Dakota is the home of 4593. While being the only team in South Dakota has given us many great opportunities to grow STEM throughout our state, it doesn’t come short of its challenges. In a state with many attractions like Mount Rushmore, the Black Hills, and the illustrious Corn Palace, it’s a given that South Dakota’s economy is based on agriculture and tourism. Unfortunately, this has resulted in a lack of a STEM culture, where education, specifically STEM education, is not a forefront priority. In order to become part of the bigger picture, it is important to consider our challenges and find ways to improve upon them. South Dakota has one of the lowest education budgets in the United States, amounting to only \$10,208 per student with most being spent on textbooks and facilities. Within our district, funding for non-athletic extracurriculars is even lower. Without a priority for academic electives, our meeting space within the district is limited, restricting our space for supplies, sub-teams, and field elements. We are also at risk of losing our building as parts have been condemned due to foundational issues. With academics historically being undervalued, students in our district do not have viable pathways into science and engineering. We are doing our best to change this narrative and give students an equal opportunity to experience the joys of STEM. HELPING UNDERDEVELOPED COMMUNITIES In a state that belittles the importance of STEM, it is crucial to bring it to those less fortunate who may not get the opportunity to learn otherwise. In our district, 50% of the elementary and middle schools are Title One, meaning that 40% or more of the students fall below the poverty line. We find it incredibly important to bring STEM to these communities through our STEM nights, in which a team of two or more students bring our robot for kids to drive around. This also helps us advocate for the creation of more FLL teams in our city. In addition to helping those less fortunate within our city, we are currently working on bringing FIRST to the Pine Ridge Indigenous Reservation through the local high school, Lakota Tech. This is very important to the development of FIRST in our state as it will double the number of FRC teams in South Dakota. It is estimated that only 23% of the students at Lakota Tech graduate high school, and we hope our team will encourage more students to graduate and pursue careers in STEM. Although this team will be a big step for FIRST in our state, it has taken much effort to get to this point. The Pine Ridge Reservation is more than an hour’s drive away from Rapid City, so it’s proved difficult to find viable ways to support them, with the addition of a complicated process to receive permission to enter the reservation. The hourly drive caused communication with the future team to be ineffective and we had to take the initiative to get the process started. We are currently planning a team trip to the reservation in April to show them what FIRST is all about and help them in the application process. Because of our overall efforts, their team should be ready to register in the next few seasons. CREATING A PASSION FOR STEM IN OUR COMMUNITY The Pine Ridge Reservation is not where our influence ends. Since we are a team based in a rural community, our STEM impact is very important. We support the pre-existing FIRST community by assisting its teams. Altogether Rapid Acceleration has helped over 40 teams, FLL-E, FLL-C, and FTC. Every year since 2017, we have hosted an annual FLL scrimmage for FLL teams, which has become a highly anticipated event among our FIRST community. We also volunteer to help out with our regional qualifier and show our robot to FLL teams to introduce them to the next step in their FIRST journey. On top of FLL, we support other programs for youth to encourage the development of STEM in our community. One way we do this is by showing off our team to scouting programs such as Cub Scouts, Girl Scouts, and Scouts BSA. Every year we invite a local Cub Scout pack to come in and tour our lab and drive our robot. Additionally, we invite Boy Scout troops into our lab annually to assist them in completing the robotics merit badge. We teach them about the robotics industry, hazards that may be

encountered, programming, and the design process. At the end of the night, they get to build their own robot. Biannually, we attend a Girl Scout jamboree and showcase our robot to help them with their Daisy Robotics Badge, where they have to learn what robots do, how they move, and how to design their own. We love to work with local Scout Troops especially when we are helping them to advance in rank, experience, and their interest in STEM. Girl Scouts specifically, is very important to us because we strive to introduce young girls to the possibilities of an engineering career. We have seen success in the way that the women on 4593 play pivotal roles, as leaders, teachers, and innovators. As a team, we pride ourselves on having a one-to-one women-to-men ratio, and we sustain this because of our women-targeted outreach events. Every year we showcase our robot at the South Dakota School of Mines Women in Science conference, a fair that brings 1,400 middle school girls together to explore future science careers and experiences. This is a highly anticipated event among our female members as they get the opportunity to share their joy in STEM with like-minded girls and even recruit them to the team. We sustain our female members by treating all students the same regardless of gender. The unique environment and experience we provide to our members allows us to inspire them in impactful ways. We work to create a preseason curriculum that engages rookies and encourages them to explore all aspects of every sub-team. Our preseason curriculum is also unique in how we use humor to engage new team members in a lighthearted learning environment which encourages them to keep coming back to every meeting. This engaging environment has impacted its students in substantial ways. All of our alumni have graduated high school and over 90% have gone into STEM fields and colleges. FIRST has helped our students grow to be community leaders and innovators. HOPES FOR THE FUTURE Being part of the "bigger picture" also means focusing on where you are heading and striving to create a better future. We have envisioned a future in which we will be able to expand to more teams, influence, and opportunities. This includes working to create a better future for our team and community as a whole. We ensure a bright future through our initiatives, outreach, and community partnerships. One partnership that we are excited about is with South Dakota School of Mines (SDSMT). This partnership has been beneficial to our FIRST community, as they provide the space for our Regional FLL-C qualifier. Currently, SDSMT is constructing a new club building and they have stated that they will provide a space for us. We are grateful for the room we have currently, but there is not much space to work in a 1,200-square-foot area. This is an extremely exciting prospect as it will provide us with more space to work on separate projects, access to SDSMT's tools, and space to host our own summer camps. Although we help with summer camps like Camp Invention and STARBASE, hosting our own summer camp will allow us to give kids an experience directly affiliated with FIRST, and push for more teams in our community. Due to our focus on community, we strive to foster long-lasting relationships with our community partners. Our method of fundraising gives us a unique opportunity to build personal relationships with local businesses and companies. Caterpillar, VRC, and EMW, local engineering companies, provide us generously with monetary support and wonderful mentorship. In return for supporting our team, many of Rapid Acceleration's students go on to work internships at these companies. In addition to financially, sponsors help us in any way they can, from pit signs and food to gifting and manufacturing us parts. We have created relationships with 180+ different organizations, from large companies to family-owned businesses, ranging from nonprofits like Feeding South Dakota to our local professional hockey team. The relationships and partnerships we build help to strengthen our team's public image and ability to impact those around us. We hope that these lasting partnerships will continue to sustain us in the oncoming future. BEING PART OF THE BIGGER PICTURE Throughout the decade Rapid Acceleration has existed, we have worked towards securing our place in the bigger picture of science, engineering, and our community as a whole. This has not come without challenges, but our team finds unique ways to turn adversity into opportunity. Our dedication to helping STEM grow in our community has helped us persevere through whatever obstacles may come our way. Our team stands as an example of how a

small group of kids with limited resources can work together to make a big difference in a state where STEM is neglected and undervalued. We may be a small team, but we have made progress in our goal of being the epitome of STEM so much so that if we disappeared tomorrow, it would not go unnoticed in South Dakota's STEM and FIRST community. We have secured our place in the bigger picture because we have been able to inspire, educate, foster curiosity, and most importantly, make an impact. ;

