

## **FIRST Impact Award - Team 6413**

<b>2024 - Team 6413</b>
<b>Team Number</b>
<b>6413</b>
<b>Team Nickname</b>
Degrees of Freedom
<b>Team Location</b>
Chandler, AZ - USA
<b>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.</b>
Since 2022, Degrees of Freedom (DoF) has had a 78% increase in the size of our team. DoF students are actively learning new technical skills, including manufacturing & design processes, and non-technical skills like public speaking & networking with companies. Currently, 13% of our students will be the first in their family to graduate high school & 19% of our students will be the first in their family to attend college.
<b>Describe your community along with how your team addresses its unique opportunities and circumstances.</b>
DoF is based in Chandler, Arizona and home to students from over 12 different schools located around Maricopa County. DoF realizes that being on an FRC team may be financially hard for some students, so we don't charge team fees. To ensure all students can participate, we cover costs for team shirts, travel expenses, and meals while traveling. Removing financial burdens allows students who wouldn't ordinarily have this opportunity to join robotics.
<b>Describe the team's methods, with emphasis on the past 3 years, for spreading the <i>FIRST</i> message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?</b>
DoF participates in community events, like the Chandler Farmers Market and the Chandler Innovation Fair, to spread our team's message and <i>FIRST</i> . With robot demos and adapted toys, DoF introduces STEM to kids in an immersive way. We keep a record of the number of people reached in each event in our impact documentation form. Since the pandemic, we began a tradition of making Valentine's Day bags for people in retirement homes to foster a connection.
<b>Please provide specific examples of how your team members act as role models within the <i>FIRST</i> community with emphasis on the past 3 years.</b>
Our team leads by example when it comes to assisting others. Our robot code being public on GitHub is one such example. With our Beak Squad Initiative, we dedicate part of our team to help other teams work through faults and cheer for them during competitions. This subsection of the team strives to help other

AZ FRC teams to make the Arizona FIRST community more fun and sustainable. DoF has also hosted a few student-led workshops to help spread the lessons our team has learned over time.

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

Our team opens up our build space to many teams! Team Pi, from the Netherlands, used our space during their stay in Arizona for both AZ East and West Regionals in 2023. When teams can't come to us, we go to them, like when we assisted FRC 4111 with programming. To expand our reach, we hold workshops like our programming and CAD workshops. Beak Squad assists teams however we can from programming to machining parts. DoF also helped MakersPlace start 10 FLL teams by donating 9 EV3 Kits.

**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?**

We drove 5+ hours to St. Michael Indian School in the Navajo Nation to teach middle schoolers about renewable energy and power budgeting with fun experiments using solar panels and batteries made from oranges. We introduced two Navajo Nation FTC teams to coding with a LEGO robot demonstration and CAD with the software Onshape. To draw the attention of kids, we bring a WALL-E toy to our outreach events. This inspired us to make a working WALL-E replica as an interactive outreach robot!

**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**

DoF works with many organizations to spread STEM to kids all around the globe. DoF has demonstrated our robots to Girl Scouts and kids at the Geek Girls and Bring Your Kid to Work Day events with General Motors. The Arizona Diamondbacks invited DoF to their baseball games, for us to represent STEM! We ran an FLL scrimmage in Ghana remotely, which allowed 6 FLL teams to compete. This included refereeing, judging, scorekeeping, and producing a broadcast of the event.

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

DoF holds team bonding events to encourage inclusivity, like potlucks & karaoke, creating a safe space where we build robots and have fun! Multilingual members help our non-native English-speaking members feel included. DoF has given out Pride pins at Regionals, and "I Am Enough" ribbons and Imposter Syndrome awareness pins at the 2023 FIRST Championships. Impostor syndrome is the feeling that you are not successful despite your hard work.

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

DoF students give tours of our build space to potential sponsors. This leads to donations for our parent foundation, Si Se Puede Foundation, some of which come to us. Many DoF alumni volunteer at outreach events, competitions, and mentor our sibling FTC teams. We use our Beak Squad initiative to reach out to other AZ teams in FRC, providing assistance, creating strong relationships between teams, and improving the FRC experience in AZ. We've assisted 18 teams with Beak Squad!

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

Last year during the World Championships we talked to Boeing, and they were so touched that they decided to support our team further by becoming a Beak Squad sponsor. This year, DoF invited our friends at Boeing to participate in our annual Jeep Hack where we modify toy jeeps for children with motor disabilities. With their help, we modified 5 toy jeeps! To engage our anodization sponsor and show them the effects of their support, we gave them our robot and outreach documentation.

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

This year, 50% of our students are new to DoF, allowing us to achieve more than ever, but also introduced additional challenges like how to properly onboard and train the new team members. To better onboard the new students, veteran students made workshops introducing the subteams. To train our students and prepare them for competitions, we built a new robot for our multiple off-season competitions. During this, our new students also learned how to scout and strategize.

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

Our goal is to help ALL students prepare for the future. DoF offers hands-on STEM learning opportunities that many schools cannot. DoF focuses on developing creative problem-solvers. Failure is inevitable, like code not working on the first try. We are taught how to problem solve, which lets us grow from failure, which anyone can use no matter their profession. DoF doesn't strictly create engineers or machinists, but rather a generation of people who are inspired for a successful future.

**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.**

DoF encouraged all students to participate in this year's Impact submission. Within 1 year, we increased participation by 267%! Last year, we had non-technical days where students helped with Executive Summaries, and the essay and practiced communicating our team's story. Contributing to this year's Impact submission was a requirement for being considered for Drive Team or Pit Crew. This year we had 11 people from our team audition to be an Impact presenter, nearly 3 times more than last year.

**Judge Feedback**

**Who/When**

**Feedback**

Mar 25,  
2024  
03:50:38  
AM EST

**What parts of the submission were unclear to you?**  
**An area the team has an opportunity to improve.**  
**Something that really impressed the judges.**

**Essay**

Degrees of Freedom (DoF), founded in 2016, began as an all-girls team that provided young women access to STEM opportunities. In 2020, DoF merged with its sibling team, Binary Bots, creating a

gender-inclusive team. To proudly display our support of women in STEM & to recognize the girls who started DoF, bows are a part of our team uniform. Today, DoF members come from 12+ schools across the AZ East Valley. DoF is sponsored by the Si Se Puede Foundation (SSPF) & shares a build space with two FTC teams (18312 & 18445). DoF recognizes & embraces the diversity of our community as an inclusive team. We welcome non-native English-speakers & currently have members who speak Spanish, Hindi, Gujarati, Tamil & Mandarin, in addition to English. Our students support those learning English, ensuring they feel welcome on the team.

DoF is due-free, bridging the STEM divide for students who otherwise couldn't afford to participate in FRC. We cover all fees & travel expenses & raised \$61k in 2022 & 2023 for the FIRST Championships through families, friends, & sponsors! It is important DoF raises money to remove financial barriers for students interested in STEM.

Our mission is to empower our community with STEM, no matter their gender identity, race, creed, national origin, age, sexual orientation, or disability. Historically, minorities aren't proportionally represented in STEM, so we work to provide opportunities & a space to these students. 25% of us are Hispanic, 34% are women, & 6% are non-binary. Approximately 25% of us are in the LGBTQIA+ community. We provide students with the tools, environment, & sense of belonging that is necessary for them to reach their full potential, not only in building robots, but in everything they do in the future.

Our team seeks to share FIRST values to our community. We impact those around us, such as making imposter syndrome pins to hand out at competitions or creating a laser-cut Gracious Professionalism (GP) pin that we pass around at meetings, recognizing those who displayed GP. This was inspired by a FIRST Championship volunteer who gave one to us in 2023!

DoF encourages teams to come to our STEM Center & use our resources. We offer access to multiple machines: a manual lathe, manual mill, CNC router, CNC mill, laser cutter, & 3D printers. One of our most used commodities at the SSPF STEM Center is assisting teams when they are machining parts. We also provide access to 1/2 an FRC field for teams to run tests. We monitor teams' requests & share this information with the AZ Regional Director so she knows how to better support AZ FIRST teams.

Beak Squad is a student-led initiative created in the 2022 offseason, inspired by our previous efforts in uplifting other teams by helping with technical & non-technical issues. We helped 4111 by visiting them, helping with programming. We had a booth at the AZ FRC State Championship where we assisted 6 teams. Beak Squad continued into the season by announcing its support to teams at kickoff. We presented workshops at kickoff on the following topics: Impact, Imposter Syndrome, Beak Squad, & Scouting/Design. Since its inception, Beak Squad has assisted 18 teams! DoF engages with our community in many ways! We went to an Intel Event at the AZ Science Center where we talked to 1100 people about our team & the skills we've developed. At the Chandler Farmers Market, we partnered with our sibling FTC teams to demonstrate our robots & talk about FIRST to people who may not be exposed to STEM. We participate in the Chandler Innovation Fair where we represent our team & FIRST to all ages. DoF partners with many organizations & sponsors to support our community. For the past 3 years, we partnered with General Motors to perform a captivating presentation & robot demonstration to local Girl Scouts. In 2023 we partnered with Magical Motors, SSPF, Boeing, & our sibling FTC teams for our annual Jeep Hack where we worked together to adapt 5 power-wheel toy jeeps for kids with motor disabilities by adding accessible buttons to the cars. Reaching out through STEM is amazing, but DoF helps our community in different ways! Before COVID, DoF had a bond with the seniors at Solterra

Senior Center, helping them with technical difficulties, like installing a TV or using a smartphone. When we couldn't continue the meetings during COVID, we started a tradition of making them care packages for Valentine's Day every year since. DoF partnered with Matthew's Crossing Food Bank to host food drives at Sanghi States, collecting 476 lbs of food since 2022. With these efforts, we've reached many people from kids to seniors in our community.

In 2023, 7 of us went to St. Michael Indian School on the Navajo Nation to host STEM-related activities with students from that community, including 2 rookie FTC teams. During the trip, we taught electrical concepts using oranges as batteries, discussed renewable energy using solar panels, helped with a power budgeting workshop, & participated in Rube Goldberg Machines. We also led a Robo Roundup event with Rockpoint Community School in Kayenta. During Robo Roundup, DoF showcased FTC field elements, taught programming using LEGO robotics, & introduced them to CAD.

In May 2022, MakersPlace in Ghana, Africa, reached out for help starting an FLL program. DoF donated 9 EV3 Kits to MakersPlace & sent 4 more from other teams recruited through Chief Delphi. We recruited 5 FRC teams to help MakersPlace mentor the 6 FLL teams they started with the kits donated. In April & May 2023, we helped set up a scrimmage for MakersPlace to show the kids what a competition is like. In February 2022, we spoke to Mexican FTC team 20327, providing them with guidance in Spanish on ways they can stay organized, develop a social media presence, & create an Engineering Notebook. In May 2022, FTC 18335 in Colombia reached out to us to learn about DoF. We raised funds to donate & deliver an FTC kit to them. We spoke to FTC 19196 & 19197 from India & shared our experiences in FIRST. We reached out to team 6968 from the Netherlands, coming to compete in AZ. They needed a place to send their robot, but rather than being just a mailing address, DoF offered them our guest pit & build space so they could practice for the upcoming competitions. 6968 used our machines to make parts for their robot and their drive team used our field for practice. We offered 6968 technical & motivational support during the competitions by cheering them on with their team chant. After the AZ Regionals, we received a heartwarming statement from 6968: "Degrees of Freedom played a huge role in refreshing our motivation for the future."

DoF uses both social media & news sites to "make it loud" in our community. AZCentral news articles shared DoF's team's story & successes, spreading FIRST in our community! Multiple news stations, including ABC15 Arizona, shared the story of our Jeep Hack done with Boeing & Magical Motors. On Facebook, our team posted videos & photos of our robot's progress during Build Season. DoF has annual Robot Reveals to show our robot & its abilities. Before the 2023 FIRST Championship, DoF & other AZ teams needed to transport their robots to TX from AZ, so we offered to transport other AZ teams' robots. We recorded the journey through Facebook & Chief Delphi with WALL-E as our driver. This led to our "Where's WALL-E?" campaign which reached 60k+ people on social media & Chief Delphi. This past off-season we built a working WALL-E replica to join us on outreach events & connect with our community. During the 2023 FIRST Championships, DoF gave out pins saying "Not an Impostor" to raise awareness of Impostor Syndrome. This is the feeling of unworthiness despite being qualified to participate. Soon, we saw lots of people coming to our pits for these popular pins. We also had badge ribbons made that said "I am Enough" to help remind everyone that they ARE enough. At our local kickoff this year, DoF gave a presentation about Impostor Syndrome & applied to present this workshop at FIRST Championships!

DoF has been featured in promotional videos with organizations & sponsors. In February 2023, we participated in a video for MakerBot, showing how we use the 3D printers they donated to SSPF. Since

25% of us are Hispanic, our sponsor Cox filmed us for Hispanic Heritage Month. The American Industrial Hygiene Association also filmed us promoting safety in the workshop & even presented us with a donation. Last season, Microchip created videos to highlight AZ teams, DoF being one of them. They came to our buildspace & filmed us during competition. The video production professional stated, "In my 20+ years of working in video production, I have never run into such an amazing group of people."

The heart of our outreach is our students. Being a community team, we have members from various places. DoF recruits students via word of mouth, the Chandler High School club fair, & current students' family members. Students & mentors have also been recruited from our outreach at events. We maintain close relations with our two sibling FTC teams through sharing our STEM Center, creating a welcoming environment for them to join DoF.

Engineering benefits greatly from diverse viewpoints, which lead to innovative solutions. We connect people who might otherwise lack access to STEM with the resources & encouragement they need to change the world. We are dedicated to creating an environment where everyone, regardless of their background, is accepted & given the chance to thrive while learning STEM. By reaching out to teams & people both locally & globally, we create strong and inclusive leaders who have the skills to overcome obstacles and will inspire others as they create an innovative future.

Wings Up! Hearts Out! Reach High! Degrees of Freedom! ;

