

***FIRST* Impact Award - Team 6647**

2024 - Team 6647
Team Number
6647
Team Nickname
PrepaTec - VOLTEC Robotics
Team Location
MONTERREY, NLE - Mexico
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.
VOLTEC has shaped over 8 generations and 500 students on their STEAM journey. Last year's alumni generation had a 100% rate of involvement in STEM careers. Additionally, 90% remain engaged in STEM areas in its different facets, participating in sustainability and computational development projects, in addition to serving as mentors to our team and others nationally and internationally.
Describe your community along with how your team addresses its unique opportunities and circumstances.
We live in Mexico's most polluted city, leading to high temperatures and water scarcity. Since 2022, we have suffered from droughts that lasted up to 6 months. This is why we took on the task of creating projects to tackle these problems: Waste-E, recycling 1000 kg of electronic waste; and Smart Shower, saving 16,800 liters of water; impacting around 6,000 people. Nowadays, we are developing projects along with our community to reduce electricity consumption.
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?
Our mission consists of different projects: VOLTEC Institute, Amper Up, Open Alliance, Women Of Tomorrow, No barriers, among others with which we have impacted around 18,000 people. These are linked through a strategic design that allows us to accompany our participants throughout their development and inspire them constantly. As a result, we get around 2,000 young people into the STEM world each year and make sure they persist in it.
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.
We aim to inspire future generations through <i>FIRST</i> values. An example of this can be appreciated in our project VOLTEC Institute, where our team members teach Robotics and STEM-related topics to kids, ages 6 through 15. Junior members, Andrea and Karim, in addition to being VOLTEC Institute teachers,

are mentors of our FLL Explore team. They are not only outstanding students, but also leaders who constantly pursue the future, encouraging kids to believe in their capacities to change the world.

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

We created Amper Up, an international mentoring network that facilitates the exchange of information and assists rookie teams on their way to becoming self-sufficient. In addition, in 2022, we became the 1st Mexican team involved in Open Alliance, sharing the entire process of the making of our robot during the season, including our CAD, code, and even our mistakes, with another 112 international teams. Additionally, during the last 2 years we've started 2 FLL teams and 2 FTC teams.

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?

Guiding future STEM leaders is a VOLTEC member's mission. Therefore, we offer conferences and congresses through our program to attract and inform young generations about the team, as we did through the International Book Fair and Women of Tomorrow. In addition, we run projects such as VOLTEC Institute, reaching an estimate of 2500 students. As our main result, we have increased the interest of the children in our community to continue their studies in schools with STEAM programs.

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

Our goals heavily involve collaborating with entities that share FIRST values to impact our community. Some of our crucial joint ventures are with GM, Equitek, and Atos, with whom we produce big STEM Outreach projects, such as No Barriers, along with the CSO CONECTA, and Amper Up with national and international teams. This year, John Deer, our most recent alliance, is supporting us with mentors and resources in order to accomplish our objectives.

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

Highlighting the participation of women in academic, social and scientific fields is one of our major goals. To accomplish this, we collaborate with our local government to reach girls from more than 30 schools through the Women of Tomorrow project, dedicated to demonstrating their value and impact on our society. Additionally, we receive training from the CSO CONECTA to raise awareness of the different impairments, creating inclusion-oriented events on our campus and in underserved communities.

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

Through our STEM Outreach program, we've initiated 30 impactful projects addressing diverse issues across age groups in our community. To ensure their effectiveness, designated team members meticulously compile all our team related data. Additionally, every year seniors craft manuals with their experiences, which are then passed onto future generations, motivating them to innovate with the existing information and generate a meaningful impact on our community.

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

past 3 years

We received mentorships from various experts in the field. We have managed to recruit and create alliances with different corporations by assisting events such as Youth Innovation. Besides, through our social media, we promote events and contact organizations for them to engage in our team's activities. Finally, we are operating a crowdfunding link, where we have received more than \$26,000 dollars in donations, which we use for the involvement of more kids and teens to STEAM.

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

Following the security measures has been one of our main concerns now that we have new machinery in the workshop. Therefore, with the help of experts in the subject, we've established the new safety program ProTech, which includes the subsequent stages: the development of specialized guidelines; training for the usage of machines like CNC and DTF; and the assignment of supervision roles. This has helped us create a safer environment that will allow us to efficiently build several projects.

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

It is crucial for VOLTEC to create a Coopertition® culture through mentorship projects like Amper Up and Open Alliance. By sharing our acquired knowledge and helping other teams, we've accomplished a supportive and caring community. Also, inclusion has become a great concern for our team; going from only 3 women members to almost 70% in a 100-members-team wasn't easy. Consequently, through donations, events, and our outreach program, we've impacted about 18,000 people with FIRST's values.

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 consider ourselves a team with a high social and cultural responsibility. Because of this, in recent years, we have created projects aimed to eradicate issues such as poor education, lack of opportunities, pollution, inequality, poverty, water scarcity, among others. We are proud to leave our mark on the world by fulfilling 14 out of the 17 sustainable development goals established by the World United Nations.

Judge Feedback**Who/When****Feedback**

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This team did not submit the optional question for the judges when entering their submission.

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay**ESSAY**

The world has somewhat imposed on us the belief that art only exists in the form of sculptures, paintings, and music. However, in VOLTEC, we have discovered that art is anything that involves creating

something. Throughout more than 8 generations, we have dedicated our efforts to materializing dreams and creating opportunities to generate an impact chain that enables them to become agents of change within their communities. Hence, we give color to our surroundings and our work with the certainty that art has no limits.

Blue Inspiration

In our country and in our city, there are multiple sociocultural realities. For a few, access to education and the opportunities to transcend are easily within reach. In contrast, for the great majority, both social and economic barriers greatly hinder their progress and growth.

Our team has spent over 8 generations fueling the belief that anything is possible through STEAM-focused education. To accomplish this, we created our first and major project in 2016. VOLTEC Institute stems from our desire to give access and provide children and young people in our state with quality education opportunities, which over 4 million Mexicans do not have. In this project, the moment we join the team, we become math, english and robotics teachers using Arduino and Lego Mindstorms, reaching over 2500 children in about 30 local schools, both public and private.

Annually, we hold 3 editions of the VOLTEC Institute, being active for 9 months of the year and thus, ensuring the monitoring of the progress of our students. Even during the pandemic, our project remained active by offering the training via Zoom. Additionally, with our scholarship program, some of our students have participated in national mathematics Olympics and FIRST competitions, participating in all categories in recent years.

We strive to model what we have learned ourselves. This is why we do not focus only on the teaching of robotics. Day by day, we guide future generations to be agents of change in our society, encouraging and developing their sense of curiosity, critical thinking, and teamwork. Through this training, we have created 2 FLL teams and 2 FTC teams with the aim of continuing to hone their skills comprehensively.

We've all had mentors who have guided us in our learning journey. The work of learning by teaching is something that accompanies us even after graduation. Therefore, we are proud of our Community is FIRST project: which allows us to continue sharing our knowledge even after graduating high school, either as teachers at the VOLTEC Institute or as mentors of one of our 5 teams. In the last 3 years, over 300 FIRST alumni have returned to the team as role models for each of the categories and areas.

At the VOLTEC Institute, students not only acquire new knowledge but also become part of a family that values every step of their development. That is why, with each edition, we implement new strategies to foster their personal growth. An example of this is our recent collaboration with the Contemporary Art Museum of the city. With prior training, we guided the students from the last edition of the VOLTEC Institute through the exhibitions of renowned Mexican and international artists. These experiences not only awaken interest in art but also cultivate curiosity and exploration in a unique way. With every step we take together, we create an impact that endures in the hearts and minds of our community.

Yellow Collaboration

We firmly believe that the greatest victory is achieved by teaching and learning together. In recent years, we have focused on impacting our community, but we have not overseen our FIRST teammates. In our

project Amper Up, we have worked hand in hand with local and foreign teams to create an international mentoring network with the purpose of promoting enthusiasm for helping while in competitions.

Our socializing sessions and mentoring with national and international teams have allowed us to foster Coopertition®. A solid example of this is our collaboration with team Cyberius, with whom we have offered mentorship to 23 FRC teams in Mexico, so they can program their swerve-type chassis without the need of previous knowledge. In this way, we boost the level of robotics in our country's competitions.

We have always aimed at expanding the reach of our actions. In December 2022, we became the first Latin American team to be part of the Open Alliance. This network consists of 116 teams from 10 different countries that openly share their codes, designs, and processes to promote a culture of innovation and collaboration in FIRST.

We are not only focused on working together to develop Engineering areas but also on the social sphere. Because of this, we invited our families, teachers, and students from PrepaTec Monterrey to our first edition of collecting and separating plastic caps in favor of children with cancer. We managed to gather a total of 541.1 kg, equivalent to approximately 108,220 caps. Thanks to this effort, we fulfilled our goal of benefiting those in need by covering the expenses of a chemotherapy session.

Purple Empowerment

We have learned that art is plural, diverse, cultural, inclusive, but above all, inclusive due to its infinite shades. At VOLTEC, we have gone from having only 2 women on our team to having the valuable contribution of more than 40 women, with more than 50% of them being team leaders. This has not only strengthened us, but it has also created an outstanding internal group of women determined to positively impact society through female empowerment. From their inspiration, originated the "Women of Tomorrow" congress.

We have held annual editions since its creation in 2022. In the most recent one, we had the collaboration of our local government, the Ministry of Women, and the Ministry of Public Education of Nuevo León. In this congress, women from our team and leaders of our society give conferences and workshops on various topics. With themes ranging from artistic introspection, video game programming, to digital design of rocket and robots, we promote that girls and teenagers break the gender stereotypes that persist in STEAM.

This congress has reached around 300 girls in our state. With the support of congressmen, mayors, and sponsors, we succeeded in organizing and transporting girls from 50 schools from 5 municipalities of Nuevo León, including low-income areas, such as a public school in the rural municipality of Cerralvo in our state. It is of the utmost importance for us to create a safe and respectful environment which takes into consideration the geographical and demographic circumstances of the attendees too.

Our commitment continues to grow along with our reach. This year, in collaboration with the BOSCH Foundation, we sponsored Herstory EGL, a student association from our high school that promotes gender equality and women's empowerment. With this support, the congress "Write your story and change the narrative" will be held in March 2024, where we will have the attendance of more than 270 girls from public primary schools in Nuevo León.

Pink Motivation

We create and participate in events to involve more young people in science and engineering. In 2022, we gave a conference about our team at the Monterrey International Book Fair, where around 250 teenagers from 3 different secondary schools attended.

Likewise, every year we visit the San Ángel Sur community to celebrate Children's Day and, last December, Christmas. In both events, we donated toys collected at our high school; and for our Christmas Miracle event, we had STEM activities and workshops at a secondary school in this community, reaching and having an impact on approximately 2500 young people.

In our commitment to spread inclusivity within FIRST, we initiated the No Barriers project with the CSO CONECTA, promoting the participation of individuals with disabilities in robotics. Through joint efforts, we provided diversity training and welcomed more than 25 participants from their programs, fostering a sense of belonging in our team.

Orange Empathy

At VOLTEC, we focused on developing projects and events to meet the needs of our community. In 2023, we participated in the "Zero Hunger" campaign, which aims to eradicate food shortages in low-income communities in our state. Along with our team's families we donated around 342 kg of basic food products. In this way, and with the help of the PrepaTec community, we beat the collection record of previous years.

Green Innovation

We are committed to finding solutions to promote the construction of a sustainable society. In response to the severe drought we experienced in 2022 in our state, 3 VOLTEC women developed a "Smart Shower" to optimize water consumption in bathroom systems, saving around 48 liters of water per shower. Their functional prototype won first place nationally at the Caterpillar Hackathon.

In 2022, we led an internal campaign at PrepaTec, gathering 1000 kg of electronic waste in one semester. Additionally, we partnered with a local recycling company for mass e-waste collection. Our "Week in the Dark" initiative involves voluntarily cutting off electricity daily for a week, aiming to raise sustainability awareness among 1500 people and save 15% of PrepaTec EGL's total electricity consumption.

In each project and event that we have carried out since the beginning of our team, and with a special focus in the last 3 years, we have supported the advancement of 14 of the 17 Sustainable Development Goals established by the UN. Our pledge to innovation and art has transcended beyond the limits of a simple color palette and we have reached goals that are a testament to our firm commitment to a more sustainable, inclusive, just, and balanced planet. We are proud to know that we are leaving a lasting and positive footprint in our world.;

