FIRST Impact Award - Team 4253

2025 - Team 4253

Team Number

4253

Team Nickname

Raid Zero

Team Location

Taipei, TPE - Chinese Taipei

Describe the impact of the *FIRST* program on team participants within the last 3 years. Think about percentages of those graduating high school, attending college, in STEM careers, leadership skills, and serving as mentors/sponsors in *FIRST* programs.

Raid Zero (R0) drives change in STEM. With a 100% graduation rate, 99% of our alumni pursue STEM at top schools like MIT, Stanford, Harvard, and Caltech, later building successful careers at Google, NASA, and Microsoft. FIRST is our gateway to giving back—dozens of alumni volunteer as CSAs, translators, and judges. Even as past members move to high schools abroad, they continue to carry R0's mission worldwide. Last year, one even started the Philippines' first FRC team, 9715, with our support!

Describe your community along with its unique opportunities and circumstances. Think about your geographic region, diversity of town/school, language barriers, socioeconomic barriers, and cultural expectations.

Taiwan (TW), home to innovators like TSMC, is a hub for innovation. Yet, our Confucian culture prioritizes testing and rote memorization over curiosity. R0 challenges this by championing project-based learning (PBL) and reigniting passion for STEM. With an American education, our team bridges TW to the world by translating manuals and swerve docs, closing resource gaps, and partnering with the government's Department of Education (DoE) to transform the education system.

Describe the team's methods, with emphasis on the past 3 years, for spreading the *FIRST* Mission in ways that are effective, scalable, sustainable, and creative.

R0 strives to bring STEM opportunities to underserved students. In rural Taiwan, we introduced FLL to 200+ Indigenous students. At Taipei Veterans General Hospital, we helped 20 chronically hospitalized children explore robotics for the first time with FLL. To sustain growth, we've partnered with the DoE to train 6 FRC teams as FLL mentors through our Little Engineer Training Program, published detailed Mandarin mentor guides, and developed new public school robotics curriculums.

Describe your team's goals and the progress you have made towards them to fulfill *FIRST's* Vision.

R0 seeks to transform education with PBL, driving policy and cultural change in TW's education system. With the DoE, we've already implemented our Mandarin FLL curriculum and PBL grading rubrics in 6 public schools, inspiring 250 schools to attend our showcase in June! Within our school, R0 fosters a vibrant STEM community through our annual Extreme STEAM Fair and MakeToys event, inviting parents to see the innovative STEM projects that 60+ pairs of high school and lower school students created.

What impact has your team seen from your efforts described in the above question? How does your team measure impact?

Featured 5x on the news, R0 has reached 50K+ people online and 1000+ in person over 3 years. We've hosted 22 FLL sessions with 550+ people, 3 TechCube OpenHouses & Scrimmages, 2 webinars, and a nationwide FRC conference. Our outreach crosses borders, spanning Vietnam, the Philippines, and Bhutan. Yet, R0 measures impact not with numbers but people—moments like when a cancer patient told us he had finally achieved his dream of becoming a "robot builder" with FLL continue to drive us forward.

Please provide specific examples of how your team and team members act as role models within the *FIRST* community with emphasis on the past 3 years. How do you share these best practices with other teams?

R0 leads by example, embodying Coopertition to uplift FIRST. Promoting student-led learning, we hosted Taiwan's first FRC Research Conference, inviting 300+ students from 26 teams to workshops and panels. We prioritize knowledge-sharing by opening our TechCube to 30+ teams, providing tools, training 200+ students, and hosting scrimmages. To level the playing field, we supplied critical parts like gearboxes, shared CAD designs, and published Mandarin swerve guides for 10+ under-resourced teams.

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

In under a year, we've transformed FLL in Taiwan—impacting 550+ students, launching 15 teams, and providing $63K worth of LEGO kits. Our "Train-the-Trainer" program equipped 100+ students across 6 FRC teams as FLL mentors. We started the Philippines' first team (9715) and Taiwan's team 10034, while mentoring South Saigon's first team for 2026. We've mentored 26+ teams by publishing Mandarin swerve docs, supplying critical parts, and hosting OpenHouses, scrimmages, and a national FRC conference.

What other initiatives have you created, grown, sustained, or participated in (*FIRST* or otherwise) to help inspire young people to be science and technology leaders and innovators? What outcomes have you seen from your efforts in the past 3 years?

Alongside advocating for PBL, R0 champions environmental sustainability by empowering students to create eco-conscious solutions. We engineered a sumo robot from recycled materials and 3D-printed parts, allowing students to build and take home their creations. Launched in Hualien, our EcoRobot initiative reached 50+ underprivileged students with our Indigenous Impact Club. Expanding to Bhutan, we engaged 40+ K-6 graders, also teaching design through TinkerCAD and basic programming.

Describe the partnerships and relationships that you've created with other organizations (teams, sponsors, educational institutions, government, philanthropic entities, etc.) and what you have accomplished together, with emphasis on the past 3 years.

Our partnership with the DoE is reshaping education in Taiwan: we introduced our FLL curriculum to 10 public schools and secured government support for FIRST in classrooms. Inspired by our efforts, Foxconn's YongLin Foundation donated $18K for LEGO sets, while we rallied our community to contribute $45K in EV3 kits. In collaboration with 1919 Crisis Relief, hospitals, churches, and schools, we've brought FLL to students who would otherwise lack the opportunity, ensuring robotics access for all.

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

R0 champions gender equity with an all-female executive leadership, setting us apart in a traditionally male-dominated field. Our vibrant neon pink and dark gray colors symbolize our commitment to breaking barriers, as we partner with Girls in STEM to inspire middle school girls to pursue FRC, challenging the idea that robotics is "just for guys". We helped establish Taipei First Girls HS's Team (6191) and continue to assist all-girl teams 6191 and 8806 with technical training and scrimmages.

Explain how you ensure your team and the initiatives you have created will be sustainable.

Sustainability starts from within. In our school, we pushed for a Robotics & CS graduation requirement, ensuring all K-12 students gain hands-on STEM experience. To support knowledge transfer, we founded Raid One (8503), our junior team that gives underclassmen direct FRC exposure. Through Tasting Week—where freshmen explore subteams—and weekly workshops, we sustain team growth, cultivating future leaders who will continue R0 initiatives and help the DoE implement our FLL curriculums long-term.

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

With R0 students excelling in music competitions, varsity sports, speech & debate, and even joining K-pop groups, we've worked hard to ensure our talented members never feel overwhelmed. This year, we're especially proud of our improved workflow management and organization. By leveraging tools like TimeTree, Loops, and weekly subteam meetings, we've helped members stay focused, balance commitments, and stay connected even when they miss work sessions!

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, particularly noteworthy, or had a large impact.

We spearhead the Ministry of Education's (MoE) initiative to expand AI literacy nationwide through PAIA, an online machine-learning platform. While the MoE faces a shortage of trained educators for this new initiative, we took the lead to bridge the gap. With our grassroots program, RoboYouth Taiwan, we mobilized 10 FRC teams to implement PAIA's curriculum. Starting in June 2025, these teams will bring AI education to schools in five cities, ensuring broader access to cutting-edge education.

Judge Feedback

Thank you for your time! What aspects of our outreach stood out the most, and where do you see opportunities for us to deepen our impact?

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay

"My life goal has always been for my grandchildren to have access to classes like these—LEGO project-based lessons that are both fun and inspiring," shared Pastor Yuan after we introduced afterschool FLL sessions at the community church in his village. His words embody the ethos of Raid Zero.

Just as a single seed can grow into a thriving meadow, we plant seeds of innovation within and beyond Taiwan, cultivating the leaders of tomorrow. As the premier FRC team in Southeast Asia, Raid Zero drives creativity and critical thinking through hands-on, project-based learning (PBL), challenging the norms of test-based education.

ESTABLISHING OUR ROOTS: Our Community of Robot Lovers

From a dilapidated basement room, our school community raised $10 million to build the six-story 4,380-square-meter TechCube that acts as a headquarters for STEM innovation in our K-12 robotics program. Every year, we unite students across all divisions in Extreme STEAM, an event where secondary students mentor over 60 elementary students, guiding them in creating projects like button game boards and sumo robots. The event culminates in a showcase, igniting a passion for innovation through collaboration.

Recognizing our impact, our school administration implemented a Robotics & CS graduation requirement, ensuring 100% of K-12 students engage in hands-on STEM courses. To provide more STEM opportunities, we established Raid One (8503) in 2021, a junior FRC team that equips underclassmen with FRC experience and leadership training.

Our success drew national attention, with the Taipei Department of Education (DoE) studying our robotics program as a model for STEM education. After touring the TechCube, they requested our engineering notebook templates, grading rubrics, and course catalogs to shape education policies. Our TechCube has become their inspiration for a potential robotics youth center.

BLOSSOMING INNOVATION: Transforming Education

Innovation starts with empowering the youngest minds.

Raid Zero actively devotes our time and resources to addressing the traditional focus on rote memorization in Taiwan's education system, which often overlooks the value of hands-on PBL learning. To bridge this gap, we introduced FLL to 550+ students across four regions (Taipei, Taoyuan, Hualien, and Taitung), integrating PBL classes into the public school curriculum and hosting mentor training to ensure lasting impact.

We proposed the 小小工程師培訓計劃 (Little Engineers Training Program) to the DoE, advocating for the establishment of semester-long FLL courses in six elementary schools across Taipei. We invited FRC Teams 6191, 7497, 7589, 7645, and 8020 to our "Train the Trainer" sessions in the TechCube. These sessions equipped 100+ FRC students with the skills to mentor FLL Challenge teams, teaching them how to design and construct EV3 robots with Mission attachments.

To establish and sustain this initiative, we raised $18,000 from Foxconn's YongLin Education Foundation to purchase 30 LEGO SPIKE Prime Sets and Extension Kits, equipping 15 FLL teams with essential resources to start competing next season. Additionally, we successfully rallied our community to donate 60 EV3 kits, worth $45,000 to support furthering our FLL outreach.

We knew sustainability required structured learning tools, so we developed the first Mandarin FLL performance-based curriculum that guides students and teachers through an entire FLL season. Piloted at Taipei Changan Elementary School, we successfully guided 170+ 5th and 6th graders in building and programming FLL driving bases.

Impressed by our success, the DoE approved and adopted our initiative. This semester, FLL has already been implemented in six Taipei public schools, where FRC students are mentoring 180 students to compete in FLL. In June, all 250 schools in our city are invited to our FLL showcase, inspiring more teams to join the world of FIRST.

The DoE's adoption of our program has inspired us to scale nationally by expanding to non-FRC partnerships. We recognize that mentorship is the cornerstone of a sustainable FLL team, so we are training not only FRC students but lower school teachers, high school students, and parent volunteers to become FLL mentors for their communities.

POLLEN ON THE WIND: Expanding Access to Rural Areas

It is the ethos of Raid Zero to break resource barriers.

In Taitung, we partnered with the 1919 Chinese Christian Relief Association's after-school tutoring program—which serves underprivileged children—and offered FLL mentoring to 150+ children. We built dancing robots and FLL bases with students ages 6-13, fostering their passion for engineering.

We also provided FLL mentoring at two Indigenous schools (Amis tribe) in Taitung, where students' smiles from building LEGO robots for the first time fueled our passion to continue.

"We've long sought to bring digital learning to our church's tutoring program, and your program removed the resource barrier we faced in previous outreach efforts. With your complete user manual, high school students can learn LEGO independently before teaching elementary students, eliminating the need for an external teacher. This makes digital education a reality and bridges the resource gap between our community and cities." - Pastor Lin (Taitung Chenggong Church)

In Hualien, we partnered with our school's Indigenous Impact Club and SAIL, a nonprofit that supports underprivileged children, to bring STEM education to 50+ underserved students. During summer and winter camps, students built sumo robots from recycled materials to take home.

NECTAR OF HOPE: Inspiring Young Minds in Hospitals

While we address resource gaps in rural communities, we bring the joy of learning to hospitals.

Partnering with the Pediatric Ward of the Taipei Veterans General Hospital, we brought FLL to 20 children in long-term care. While guiding each child to build their own FLL robots, we found ourselves deep in conversations about their aspirations—many dreaming of becoming robot builders or doctors. Through FLL, we hope to empower them to look beyond their illness and dream bigger.

"One moment that stood out was a five-year-old boy who had just completed a year of cancer treatment. With mild hyperactivity, he had previously struggled to stay in activities, often leaving early. I worried he wouldn't follow along, but he was completely engaged. His mentor was patient, and despite occasional restlessness, he finished his robot. The joy and pride in his eyes were unforgettable, and even his medical team was amazed by his focus. This event was so meaningful!" said Ye Yafang, a social worker at the hospital.

CULTIVATING COMMUNITY: Nurturing FRC Growth

Serving as an incubator for robotics in Taiwan, the TechCube has welcomed over 40 FRC teams from around the world. Today, the TechCube is a hub for innovation, hosting FRC research conferences, technical workshops, and scrimmages for Taiwanese teams.

Last September, we hosted the inaugural Taiwan FRC Research Conference, bringing together 26 FRC teams and over 300 students. The conference had a keynote speech by a Mechanical Engineering professor at National Taiwan University about robotics opportunities in college; bilingual workshops on vision programming and statistical collection; and student panel discussions on team culture. Beyond technical learning, the conference sparked new research partnerships and strengthened community bonds through activities like games and the YMCA.

During the season, we host annual pre-competition FRC scrimmages, providing a rare chance for teams to practice on our full-length field—an invaluable resource in space-limited Taiwan. We also offer year-round training for FRC teams across Taiwan; last winter, six teams participated in our OpenHouse, engaging in technical workshops like advanced CAD and autonomous pathing.

In addition to in-person workshops, we are dedicated to breaking the language barrier, providing Mandarin technical YouTube tutorials and translated swerve docs.

PLANTING NEW SEEDS: Expanding FIRST Beyond Taiwan

Globally, we have expanded our reach to nurture robotics education and innovation in diverse communities.

In Vietnam, we supplied $2,000 in critical parts, helping a rookie team navigate import challenges during kickoff. We are currently mentoring Saigon South International School, a rookie team registering in 2026. They visited the TechCube, where we provided comprehensive guidance—from detailed manuals for specific subteams to software tools for programming—equipping them with the knowledge and resources to create their own team.

In the Philippines, we partnered with schools and local organizations to establish the country's first-ever FRC team, Team 9715. We provided them with a kit of parts and a complete AM14U base in the offseason before they registered, while actively communicating with their school administration to highlight the value of sponsoring FIRST teams in school.

In Bhutan, we introduced robotics to 1st-6th graders. We built sumo robots using recycled materials and 3D-printed parts, taught CAD using TinkerCAD, and covered basic programming, equipping students with the knowledge essential for thriving in an increasingly technological society.

FLOURISHING MEADOW: Sustaining Innovation

Raid Zero is more than a team—we are a movement reshaping STEM in Taiwan. We break test-driven norms, address resource barriers, and cultivate a nationwide hub of innovation through the TechCube.

By uniting industry, schools, hospitals, churches, and the Department of Education, we have built a thriving meadow of STEM education. But our mission doesn't end here. We will continue to expand our ecosystem, ensuring that every child across Taiwan is empowered to create, innovate, and lead.;