

***FIRST* Impact Award - Team 2438**

2024 - Team 2438
Team Number
2438
Team Nickname
'lobotics
Team Location
Honolulu, HI - 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.
Our Center for Innovation & Leadership (SCIL) is a shared resource for our community. It is home to FIRST® programs which enable 100% of our members to attend college and 99% to pursue STEM careers (compared to 50% & 31% respectively for students statewide). 93% of members are involved in STEM outreach programs after graduating. Alumni mentors volunteer for FIRST; alumni business owners become FIRST sponsors. Members develop skills by mentoring FRC/FTC/FLL & running STEM workshops & curriculum.
Describe your community along with how your team addresses its unique opportunities and circumstances.
We are from Honolulu, Hawai'i where 25% of youth ages 16 - 19 are not enrolled in any type of school. 18.2% of our school is Native Hawaiian and/or Pacific Islander (86% are multiracial) compared to 0.2% nationally. The demographics of our team reflect our diverse community. We are 100% BIPOC &/or multilingual, and this guides our outreach work. We work specifically within Indigenous communities to build STEM proficient youth; this combats their underrepresentation in the labor force.
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?
Ignite Publishing House (IPH) shares FIRST principles via K-12 STEM curricula (1,700 downloads/51 countries/6 languages). We started robotics programs to indigenous communities in HI, NZ, Tahiti, Navajo/Yüpiik/& First Nations, contributing an average of \$27,000 per project. We develop teacher PD to advance FIRST principles. We track STEM involvement & surveys show a 236% increase after our programs & 100% of schools continue robotics. FIRST with Aloha supports FRC teams arriving for HI Regional.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

Members volunteer at FIRST events, mentor FRC/FIRST Global/FTC & FLL teams, develop FIRST teams/robotics clubs, build sustainable robotics programs at schools that serve primarily indigenous populations, start campaigns for FIRST principles, design open-source community projects, lead global outreach initiatives (focus on marginalized communities), empower students from 20+ countries, manage Make-A-Wish partnerships, meet w/ govt officials, build Ignite & IPH & volunteered 2500+ hrs since 2020.

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

We have assisted 140 teams, mentored 7 teams, started 12 FLL/FTC teams, & worked in 17 schools. We have updated our SCIL with \$175,000 of new equipment to better serve other FIRST teams & groups. We have secured \$60,000 as of 2024 for FIRST programs to create STEM proficient youth in HI by partnering w/ senators Michelle Kidani & Brian Schatz. We brought LEGO® robotics to 4 indigenous nations; FLL leagues will begin there in the 2024-25 season. We fundraise for rural teams (\$37k for team 7724).

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've put \$102k into igniting robotics passion in indigenous communities from New Zealand to British Columbia & revolutionized STEM education in Hawai'i's 23 Immersion schools w/ our transformative E Ola Nā 'Ōpio initiative. Collaborating w/ industry giants like Apple & global movements such as the UN's Clean Water Initiative, we're not just teaching—we're pioneering. Our Ignite programs increase STEM engagement by 236%, proving our unwavering commitment to crafting the innovators of tomorrow.

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

Collaborating w/ partners like Apple, the NZ Consulate, & the Yukon First Nations Education Directorate, as well as local government and education departments, we've secured significant funding. Through grants from the Okamura Family, Apple Education, and federal support for Native Hawaiian education, we've launched 15 STEM programs, developed over 15 curricula, raised \$40k+ for statewide STEM education, dedicated 2k+ hours to accessible STEM, and directed \$300k+ into community-focused projects.

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, entirely BIPOC and International, with two-thirds of our coaches and over half our members identifying as female, champions DEI. We offer an open-source curriculum enhancing DEI, supporting the UN's Women/Girls in Science initiative. Through We Are FIRST, we develop DEI curricula with expert-led spotlight sessions for educational staff. Our collaboration with the Office of the Kula Kaiapuni underscores our dedication to celebrating diversity, embodying our commitment to inclusivity.

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

We create open-source, customizable, curriculum based on sustainable resources. This includes users learning to teach others for continuous knowledge sharing. Programming involves training participants in

fundraising, budgeting & sponsor acquisition. We work w/ our govt to promote STEM ed funding. We are now engaged in the grant writing process to secure funds for an 'Oahu Tech Center. Our program receives ongoing support from our school's general operating budget due to our valuable work.

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

Through immersive STEM experiences & community upliftment, we foster meaningful collaborations. By aiding FIRST partners like Boeing with technical projects & crafting technology solutions for the DOE, we strengthen our ties. Partners from the private sector, like Apple & Hawaiian Air, have bolstered our STEM outreach, & in turn, benefit from our role as a bridge to community involvement. Our Sustainable Engagement Plan strategically nurtures these relationships for long-term sponsorship growth.

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

Our process knowledge is carried in and w/ senior members of our team. We do so much in a short period of time that it's easy to overlook reflection. We've realized that this is mission critical for perpetuating our team culture & structure. Now, we build time into our practices for documentation & have created positions in our subsystems dedicated to archival. This includes project postmortem, organization of curriculum, aggregating stakeholder information, & chronologizing digital artifacts.

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

We work w/ K-12 students locally and abroad to develop STEM skills needed for the future. We work w/ schools/teachers, global companies, govt. reps., & The Office of Hawaiian Immersion Schools to uphold the vision of FIRST. We devoted 2500+ hrs & \$300,000+ to this. Our goal is to also make STEM ed. accessible and equitable for indigenous & marginalized communities at home and across Polynesia (Hawaiian/Tahitian/Māori) & North America (Yüpiik/Navajo/Kwanlin Dün/Champagne/Aishihik/TI'etinqox).

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 aim to strengthen our DEI work and lean on our unique identities to propel us forward. Our team diversity inspires us to unite technological innovation and ancestral knowledge. We believe that innovation is not despite cultural differences, but rather, because of them. In highlighting the person behind the engineering we unlock a future of possibilities, where who we are, and where we come from is our power, not our hindrance.

Judge Feedback

Who/When	Feedback
Apr 06, 2024 02:14:38 AM EST	Mahalo piha for your time. What advice do you have for us to continue in our work beyond the robot and how can we be more clear in communicating the magnitude and impact of that work? An area the team has an opportunity to improve. Something that really impressed the judges.

Essay

We are 'Iobotics, Team 2438 from 'Iolani School in Honolulu, Hawai'i and we are committed to building a STEM proficient future for our island home. We believe that programs like FIRST® are mission critical for developing a thriving community of young people. We work to empower underserved and marginalized indigenous and native learning communities locally and globally through our outreach division: Ignite. Our season theme this year, Ho'okumu (coming full circle), represents the new phase of our greatest initiative, E Ola Nā 'Ōpio (the youth shall thrive). E Ola Nā 'Ōpio embodies our multi-year effort to support STEM education for Hawai'i's keiki (children).

BREAKING BARRIERS TO EDUCATION

STEM Proficient Youth In Hawai'i, the challenge of rising homelessness, poverty, and emigration threatens community prosperity. Our mission is to counter this by promoting STEM education across the state, believing in the power of education and technology to uplift communities. Our efforts have led to significant achievements, including the implementation of robotics in 17 schools, enhancing STEM participation by 236%, and contributions of more than \$300,000.

Our season's motto, "Ku'u one hānau Hawai'i" (Hawai'i, the cherished sands of my birth), embodies our profound connection to our homeland and our dedication to its future. Through our flagship initiative, E Ola Nā 'Ōpio, we have achieved success in our local community. Our efforts have expanded across O'ahu, leading to a partnership with the DOE's Office of Hawaiian Language Immersion. This collaboration integrates robotics into the curriculum of every Hawaiian Language Immersion school across the state - a network of 23 schools distributed across O'ahu, Maui, Hawai'i Island, Molokai, and Lāna'i. This milestone underscores our commitment to build a technologically proficient generation throughout Hawai'i.

Ignite We run a global alliance of FRC teams and schools united in advancing the FIRST mission. Our international network spans across diverse regions including the Navajo Nation, First Nations in Canada, New Zealand, Taiwan, Spain, & Belize. Beyond facilitating STEM programs in Ignite-affiliated schools, we foster deep connections both within our team and with our global partners, supporting mutual objectives. Highlighting our commitment to solidarity, we redirected our Engineering Inspiration award of \$5k and raised an extra \$13k to enable the Molokai team's debut at the World Championships, when financial constraints threatened their participation (\$37k to date).

Ignite Publishing House (IPH) Under IPH, we publish free open-source (O-S) STEM curricula in 51 countries & 6 languages. More than 15 lessons have been used in schools in Hawai'i, the US, Yukon, Canada, New Zealand, South America, Mexico, South Korea, Spain, Hong Kong, & the Philippines.

Working with Government To create meaningful change, not only do we need strong programming and well-written STEM curriculum, but we need resources, funding, & supportive legislation. Systemic change begins in government. We meet and talk to representatives to secure funding (\$60,000) for STEM programs and encourage (STEM) professional development opportunities for teachers. Our partnerships include Hawai'i State Senator Michelle Kidani, Former Governor David Ige, U.S. Congresspersons, and our most recent fellow, Senator Brian Schatz. Continued partnerships with government officials will pave the way for conversations & collaborations between the government and our youth.

Scalable & Sustainable Programs Our programs are created with scalability & sustainability in mind. We

do this with: O-S curriculum, equitable design and most importantly, STEM training so communities can continue programs autonomously. For example, our SumoBot program immersed students in engineering and taught them to build small bots. After running this program in the Boys & Girls Club, we developed an open-sourced, affordable, curriculum that eliminated the need for a laser cutter, thereby breaking down financial barriers to entry in robotics. We also created a corresponding training program to support rising STEM leaders on their own journeys; we recognize how impactful & important it is for students to see people from their own communities in positions of STEM leadership. Our focus extends beyond immediate financial viability to ensure the enduring impact of our programs. We build and maintain our relationships for the long-term. It's an incredible feeling to work with a kindergarten student who later returns to our middle school programs as a STEM proficient 8th grader.

Sponsors & Stakeholders Our Sustainable Engagement Plan (SEP), designed with 3 and 5-year outlooks, delineates our strategic approach to attract and keep sponsors engaged. By aligning our project's mission and vision with our donors' community objectives, we streamline our goals and magnify the success and impact of our initiatives. Our most substantial support has been garnered from the Apple Education Grant, Hawaiian Airlines New Zealand, Apple Canada, and Apple New Zealand, along with federal grant opportunities facilitated by the Office of Senator Brian Schatz and Hawaii Family Grants. Thanks to the generosity of these sponsors, we have successfully secured \$1 million in funding for the next 7 years. This will ensure the continuation and expansion of our programs and lay a solid foundation for sustained growth and community impact.

PRESERVING CULTURAL IDENTITY

Building Global Communities In the vibrant mosaic of Hawaii's Lāhui, we are deeply committed to fostering innovations that are culturally meaningful, safeguard identity, and celebrate heritage. Our mission is to extend these enriching educational experiences to indigenous and underserved communities throughout Polynesia and North America.

In our project, Te Hekenga a Rangi (Descendants From the Skies), we ran scaffolded STEM programs (IPH) for Māori schools in NZ. Through this work, we increased student involvement in RoboNation & SeaPerch, an underwater robotic platform. Students built a custom bot that served a community purpose (water sampling). In this way, we are empowering communities to move beyond the scope of competitions to a place of culturally significant innovation that is more than just robots. The next year, this team from Rotorua qualified for the world championships in their corresponding robotics division and traveled to the US to compete for the first time. We continue to nurture this relationship and welcomed Māori schools to our campus in Sept. 2023 for an immersive robotics training.

Since 2022, we have developed a LEGO® robotics curriculum series (IPH) that joins technology and innovation with explorations of place, identity, and heritage. In February of 2023, we piloted the program in First Nation communities across Yukon, Canada. In partnership with the Yukon First Nations Education Directorate we ran 5 FIRST programs with the Kwanlin Dūn, Champagne and Aishihik First Nations (Project Name: Nlāyè ghàkenùúdān shì - We Will Learn Together). With sustained passion, unwavering commitment and sponsor support we can bring STEM learning experiences to every indigenous community across Polynesia and North America. An average of \$27,000 in resources and in-kind contributions are provided to every project (\$102,000 to date). In April we will welcome the TI'etinqox Nation to our school for a week long training in FIRST robotics.

Diversity, Equity & Inclusion Our DEI initiatives are central to our mission, ensuring that our programs are accessible and inclusive. By addressing barriers and biases against non-native English speakers (e.g. braille keyboards, apps that use symbols rather than words) and other historically disadvantaged groups, we aim to create a learning environment that reflects the diversity of our community and empowers all students to engage in STEM.

Through We Are FIRST, we have established a DEI Advisory Board, bringing together a diverse group of field experts to guide and support FRC teams in their efforts to embrace diversity. Our advisors lead DEI workshops, known as Spotlight Sessions, that delve into critical issues such as race, identity, the value of seeing cultures through an abundance lens, the integration of ancestral knowledge and engineering, and the importance of cultural fluency. These initiatives are pivotal in shaping an inclusive and equitable future in STEM, reflecting our unwavering commitment to diversity and inclusion.

INSPIRING INNOVATION - IGNITING PASSION

Every year, members of our team step out of their comfort zone to develop innovative solutions to global issues. Projects such as the portable data-collecting catamaran, autonomous water sampling drone, water monitoring sensor system, vertical takeoff & landing plane, sustainable electric one-man aircraft (first human-piloted flight completed in Spring 2023) and microplastic sifting robot, were showcased with the hope of inspiring future STEM leaders. These projects, shared as open-source contributions, aim to ignite a passion for STEM in the next generation by demonstrating the power of innovation in making a positive impact on communities worldwide.

'Iloboitics is at the heart of a transformative movement in Hawai'i, driving STEM education forward through innovative programs, global partnerships, and strategic collaborations. Our efforts not only address immediate educational challenges but also lay the groundwork for a future where every child in Hawai'i can thrive in a STEM-driven world.

The Executive Summary and Essay were written by TEAM 2438 and minimally edited to meet the character count with the help of ChatGPT ;

