

FIRST Impact Award - Team 5985

2023 - Team 5985
Team Number
5985
Team Nickname
Project Bucephalus
Team Location
Wollongong, NSW - Australia
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.
Limits overcome, skills expanded and opportunities explored. Statistics from the last 3 years show that for 5985, FIRST is a: -Community: 57 members from 18 schools in 3 continents -Passion: 61% in multiple programs -Dedication: 49% mentoring FIRST teams -Future: 100% planning tertiary education and 97% seeking STEM careers -Legacy: 56% of alumni returning as mentors -Pathway: 100% of alumni in tertiary education or STEM careers -Lifeline: 54% claim FIRST as their place to be safe and belong
Describe your community along with how your team addresses its unique opportunities and circumstances.
PB's home is Wollongong (pop. 310,000). Between rural and urban, a recovering steel industry adds to restricted funding. Here, PB has built: -A system organising STEM grants and equipment for 34 schools and FIRST teams -A major FIRST Hub accessible to rural teams, with a robust FLLC community of 206 teams (69% mentored by PB) -A teaching network active in 44% of city schools -A business model catering to locals and tourists -A diverse team including homeschool (19%) and low-income (33%) families
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?
PB's Teaching Program funds the team and inspires youth to engage with STEM and FIRST. 3 years of statistics show the impact: -Run year-round for 2,279 children in 33 venues and online. Engaged students attend for up to 9 years, whilst 86% of PB members learn to teach -Unique incentive from PB has seen 37% of students use personal robotics kits, freeing PB resources for 18 new locations - Students are engaged by 110 PB-designed robotics challenges, including 5:1 scale FRC games for LEGO robots!
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

GP defines PB culture. Over 3 years, members have: -Taught in 2,307 hrs of STEM classes, representing FIRST to students and inspiring 7583's partner program -Volunteered at 47 in-person and remote global FIRST Events -Fixed dropped robots and calmed panicked teams at 4 FLL events - Modelled Coopertition at 8 FRC events with a scouting project requiring multi-team collaboration and data sharing, even in opposition -been primary support for Australian FLLC teams, with 60+ hours of ad-hoc lessons

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

PB builds teams worldwide. In 3 years PB has: -Assisted teams via 26 published resources, 6 official programs and 7 Kickoff events -Started 10 FLLE teams through My Maker's Space -Started 28 and mentored 53 FLLC teams globally in the Teaching Program -Started 3 FTC teams, aided outreach and spoke at 2 international conferences -Created 3 FRC programs teaching strategy and GP to 34+ teams from 2 countries -Started 4 FRC teams, 2 during COVID -Started a program for at-risk youth, starting 2 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?

In 3 years, PB's STEM opportunities have: -Reached 22 diverse venues via weekly classes for all skill levels, growing attendance 35% and female participation to 30% -Engaged all ages in 172 hrs of demonstration -Formed Australia's first SWENext club, connecting 63 girls with international experts - Produced middle-school CAD lessons, used to train 28 PB recruits -Built a Scouts Australia STEM program reaching 456 youth in a National activity format -Run classes in 12 Special Education schools

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

PB thrives on collaboration. 2023 marks: -8 yrs bringing STEM to rural areas with the University of Wollongong -8 yrs running 2 STEM programs with the Rotary Club of Corrimal -6 yrs teaching CAD and creating resources for IronCAD -6 yrs mentoring 7583 and 6035, donating space and building an integrated STEM program -4 yrs promoting tertiary education with TAFE NSW to 1,202 students -2 yrs running female STEM programs with Propel Technologies -1 yr teaching STEM to at-risk students with Flagstaff

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

PB strives for accessibility, 3 years of efforts include: -Gaining 48% female membership -A free all-girl STEM program for 94 girls, reaching refugee families and starting 4 FLL teams -Remaining financially accessible. 86% of PB teach in lieu of fees -Government accredited funding programs providing 703 students access to PB classes -Providing educational and vocational STEM training to 233 youth and adults with disabilities -Engaging ages 3-97 in STEM with visits to preschools and nursing homes

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

PB and its projects endure because of the Teaching Program: -Financially, it provides 77% of team income. This grants stability and absorbs risk of new projects. Integration with government programs gives security -Structurally, it provides flexibility and removes reliance on others. Classes are easily started, stopped or moved. PB was welcomed to 18 new locations since 2020 -Socially, it provides community visibility, free student access to FRC and a pathway for 78% of recruits
Describe your team's innovative strategies to recruit, retain, and engage your sponsors within the past 3 years
PB has seen 90% sponsor growth in 3 years, building partnerships that include: -special access to season insights in a Build Blog -award plaques featuring “used” FRC Game pieces -running robotics classes for sponsor employees/members -creating excitement at sponsor events, such as robots visiting Santa at holiday BBQs -engaging employee children in team activities 58% of sponsors met PB via the Teaching Program, engaged by team members and class quality - and the fun had by children!
Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.
PB struggles with scheduling. The team spent too long getting designs to work, and over-analysed decisions. This meant reduced build time, missed deadlines, and stress. In the 2022 Off-Season, PB redesigned their Build Season approach by: -Mapping a new production schedule -Setting hard deadlines and limits on discussion time -Ensuring full-team awareness of schedule and progress -New processes for sub-team management Implemented in 2023, the changes have already made dramatic improvements
Describe your team's goals to fulfill the mission of <i>FIRST</i> and the progress you have made towards those goals.
PB has 3 main goals: -Make robotics a familiar activity. PB classes are highly visible and connect 180+ students a week with STEM -Create opportunities for all. A chance to engage is a prelude to being a STEM leader! PB’s program for children with disabilities has reached 218 students since 2020 -Build leaders, creators and thinkers. PB teaches robotics, but also collaboration, patience and more. Health providers fund student access to PB programs for both practical Life Skills and STEM learning
Briefly describe other matters of interest to the <i>FIRST</i> 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.
Independent, self-sufficient and accessible, PB: -Members travel up to 129km to meet -Treasure their oldest fans in the IRT nursing home -Ran a national FRC webinar series -Restarted the Vocational Skills Network for Special-Ed teachers -Turned a function centre into workspace for 20 FLLC and 5 FRC teams -Ran an FRC robot in a theatre performance, reaching 550+ people -Created a community library out of donated textbooks A PB member was Wollongong’s Young Citizen of the Year for robotics work

Essay

Nestled beside the football fields, the worn brick building doesn't look like much. Yet it hosts a robotics education program worthy of any modern structure - and is the heart of a community of belonging and security for a wildly diverse group of students. This home of 5985 Project Bucephalus (PB) has empowered the team's Vision: "Create Opportunity, Transform the Community". From Beaches to the Bush and Pre-schools to Nursing Homes, PB's STEM programs reach an ever-expanding audience. Now a powerful presence in the City of Wollongong (WOL), the team inspires across the world as they show Community is not just where you live.

In Community we teach. The Teaching Program is the core of PB. Since 2015, team-run robotics classes reach anyone, inspiring a love for STEM whilst generating income. The logistics are astounding! Each week PB travels 500+km, reaching 180+ students in 22 locations across the state. The program runs year round, holiday workshops reaching an extra 300+ students yearly. Pandemic classes ran in 4 COVID-safe locations, reaching 150+ students in person and expanding globally with 112 online lessons. A PB class is in session every day of the school week.

PB gleans every opportunity from the Teaching Program. It seamlessly caters to all ages, skill levels and learning styles. The program introduces PB to communities and grants self-sufficiency, providing 77% of team funds in FY2022! Vitally, it makes PB accessible: 86% of members volunteer as teachers in lieu of team fees, gaining vocational experience in the process. This financial stability and skilled workforce frees PB to trial new programs.

In Community others surround us. The Teaching Program has shared PB's identity with 6,997 Australian students. Beyond robotics, it builds resilience and creates a place of belonging. STEM-minded children are recognised early, inspired to explore FIRST and challenged to join FRC. Powerful bonds form; 78% of PB began their STEM journey in these classes - students becoming teammates, then teachers. With a new record of 42 members, stories like these define PB:

Anastasia met PB when she was isolated and floundering. Her first robotics class lit a fire that fueled a 3 year journey through FLLC and ultimately FRC. Despair was replaced by dancing with teams in Houston! In PB, Anastasia found friends and a gift for STEM - her greatest joy was being selected to work on PB's Swerve Drive. Her enthusiasm and courage now shine on every level.

In Community lies purpose. PB chooses to highlight the overlooked, creating programs like Rocketing Girls Into Robotics: a free, weekly robotics class engaging 94 girls from indigenous, refugee and low-income backgrounds just since 2020. Other programs reach varied age groups and rural and linguistically diverse communities - yet success revealed further inequity.

PB made the difference with Unlimited, a program reaching far beyond traditional STEM audiences. In just the last 3 years it has inspired STEM interest in pre-schools and nursing homes, run classes in

autism spectrum schools and Vocational Training for adults with disabilities. A \$125K Government Grant in 2020 expanded the program to weekly STEM classes for children with disabilities - reaching 196 students and 8 schools. This diversity shapes PB membership: 48% female, 67% with diagnosed disabilities or disorders, and varied educational and cultural backgrounds.

In Community lies connection. Social visibility sees PB sought out for high-profile events like youth Entrepreneurship festivals, the Comic Gong convention and Australia Day festivities, collectively reaching 50,000+ people. PB's highest priority is mutually-beneficial partnerships - the most powerful being with TAFE NSW (Technical and Further Education), PB bringing youth STEM opportunities to campus in return for the use of a vacant function centre. The building was a COVID-Safe home for 16 FIRST teams and is now a robotics hub and multi-team workshop. Here, PB hosts scrimmages, FLL and FTC tournaments, holiday workshops and 5+ weekly robotics classes. Inspired, TAFE scheduled their 2023 Industry Day with FIRST tournaments, teams astounding industry leaders.

Partnerships can deliver unexpected opportunities - like rescuing the 2022 FRC Australian Regional! When problems arose, PB stepped in with a competition-ready alternative in WOL - dusting off plans for a COVID-cancelled event from 2020. For 2 years, PB has hosted the Regional, been part of the Planning Committee and provided volunteers. Lobbying government and community groups, PB arranged \$50,000+ in funding from tourism boards.

In community is guidance. PB stands at the heart of FIRST in Australia as stewards for teams everywhere - guiding 514 students to a home in FIRST just since 2020. Sustained outreach has created a FIRST powerhouse on the South Coast of NSW. This passion transcends borders - notably to the Quad Cities (QC) of Iowa and Illinois, USA. PB equipment and volunteers have supported 38 official FLL, FTC and FRC events in these areas since 2020.

PB's passion has transformed the Australian FLLC experience. Outreach, mentoring and 4 official support programs span Kickoff to Competition. Teams that travelled 600+km to PB's FLL Kickoff now attend virtually, joining coaches from every state in Australia, even overseas! PB sustained FLLC in WOL during 2 COVID seasons, mentoring 24 teams remotely and transporting equipment to isolating students. Having run the WOL FLL Regional since 2015, PB continued the event virtually - then roared back to life in 2022 with 32 in-person teams.

Since 2015, PB has mentored 237 FLLC teams globally (starting 130), including 69% of all South Coast teams. 72% of team members are alumni. In the QC, PB brings FIRST to communities by mentoring, running displays, and assisting with grants. PB also created and runs the first FLLC/E Joint Kickoff, reaching 169 QC teams since 2017.

Creating opportunities for all ages, PB started 89 FLLD/E teams, and has run 6 Expos at the WOL FLL regional. In the QC, 42 FLLC teams have attended PB Kickoffs since 2017. PB is truly proud of creating "My Maker's Space", an official season-in-a-day event that has served 132 marginalised QC youth since 2019.

PB champions FTC as an accessible STEM option, mentoring 10 FTC teams (starting 9) in the USA and Australia. Teams use PB events for outreach, and 19 PB members assist FTC teams in their schools - even serving as emergency drivers and coaches. PB presents at coach conferences and Kickoff events. During COVID, the team's experience in remote team management was in demand - speaking online at

the 2021 Canadian FTC Kickoff and a Coach Professional Development conference spanning North America. Running a 10-team scrimmage in 2021 launched PB into running the 2022 WOL FTC Qualifier, providing access to rural teams.

Responding to need, and powered by members in 3 countries, PB has reached every continent except Antarctica! LEGO robotics kits were taken to schools in Tanzania, Ethiopia, Ghana and Kenya - team members starting FIRST in the latter. Since 2020, PB has trained teachers in Mauritania, translated and ran 2 online FLLC conferences for rural Chinese schools, spent 3 years mentoring FLLC teams in Germany, taught online classes in Singapore and mentored 2 rookie FRC teams in Brazil - translating PB resources into Portuguese.

In Community lies strength. Given this truth and scarce local resources, PB takes care to create sustainable FRC teams. Aware this takes time, initial focus was partnerships with existing teams. PB shares space and expertise, running FRC scrimmages and National Webinars. The team moderates and speaks at Mentors Without Borders, 24 Hrs of STEM, and has assisted teams globally in the Compass Alliance Call Centre. Ultimately, PB created 2 programs: The South Coast Alliance (SCA) and the Collaborative Scouting Project (CSP).

PB co-founded SCA in 2017, a collaboration of 8 teams. SCA allowed PB to save teams from collapse, run scrimmages and help 7583 start a complementary teaching program. Most importantly, workspace was provided for teams in need, 5 teams sharing PB's workshop since 2020.

CSP teaches Coopertition and strategy: building alliances that share scouting, data and analysis - even in opposition! An annual enterprise, PB leads 12+ international teams to produce a system used by 25+ teams in events worldwide. In 2022, CSP covered 3 Championship Divisions.

In Community is persistence. PB's long-term approach paid off, starting 4 sustainable FRC teams - 2 during COVID! Validating team passion, all had roots in FLL outreach and the Teaching Program. PB is excited for 9145, a 2023 rookie team of culturally and linguistically diverse students. Yet the greatest victory was in 2022: the Unstoppable program and 8844.

Unstoppable returns lost opportunities. This program targeted Flametree, a Special Education (SE) high-school for high-risk students: 52% involved with the Justice System, 100% with backgrounds of trauma, abuse and neglect. PB designed the program, pitching it to disability service providers, Dept. of Education, and Dept. of Justice - and the school received \$521K for an FRC team! Under PB mentorship, 8844 seized the opportunity with such tenacity that cautious optimism became full-fledged support: FRC is now part of the Flametree curriculum. Calling results "miraculous", Staff addressed the Vocational Skills Network - and Unstoppable expanded, PB starting FTC team 21768 at Smith St Unit SE school with striking results.

In the heart of FIRST in Australia stands a worn brick building. It was designed with very different intentions - but like many of the students within, STEM unlocked new potential. From this place of welcome and self-discovery, PB creates and links communities around the world - united by the belief that regardless of age, gender, ability, skill or location, all transformation begins with the creation of an opportunity.;

