

Chairman's Award - Team 6998

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2022 - Team 6998

Team Number

6998

Team Nickname

NNKIEH

Team Location

Tainan, Tainan Municipality - Chinese Taipei

Describe the impact of the *FIRST* 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 *FIRST* programs as mentors/sponsors.

FIRST instilled a passion for STEM in NNKIEH. With only 13 students exploring STEM in 2018, due to FIRST, elementary school students now participate in FLL, middle-schoolers in FTC, and high-schoolers in FRC and our school's AI Robot Elective. All members attend college, and some pursue CS and Engineering at prestigious institutions like Brown and Purdue. Even after graduation, they become mentors and receive advice on their entrepreneurial pursuits through our Taiwan FRC Graduates.

Describe your community along with how your team addresses its unique opportunities and circumstances.

As schools in Southern Taiwan have fewer opportunities and resources than schools in the North, we serve as an inspiration by being the 1st in Southern Taiwan to form an FRC team. Uniquely, NNKIEH is an experimental school in the Southern Taiwan Science Park. Thus, over the course of 5 years, we cooperated with the Science Park Bureau, Ministry of Education, and sponsors in the science park to assist teams and run/host workshops and mock competitions to lower barriers restricting access to STEM.

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?

Many schools emulated our STEM curriculum as NNKIEH is the only public school in Taiwan with FLL, FTC, and FRC. We spread FIRST by hosting/running mock competitions with 20+ teams and 300+ participants, introducing Project-Based Learning, teaching programming at camps and underprivileged schools, and presenting about FIRST at community events and on YouTube. We also spread the FIRST value of engaging in volunteerism and community work by donating 1,800 USD to underprivileged families.

Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

Changing Taiwan's education system that stresses standardized testing, our team members act as role models by sharing their STEM expertise and fostering passion in STEM. Specializing in CS, Jay lead workshops and presentations on Solidworks and programming to assist teams. Brian is the lead presenter at exhibitions and engages with the public to promote FIRST. On the other hand, Rain leads our members in teaching underprivileged junior-high students Java to spread STEM in our community.

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

We believe in communication and everlasting bonds that transcend competition. Embodying Gracious Professionalism, we assisted 20+ domestic and international teams, ran workshops, and hosted/ran mock competitions for 3 years with 300+ participants. With the STSP, we provided our Nanke FRC Robot Base and 5 construction spaces with specialized engineering tools to other teams. We also started the school FTC & FLL teams and Taiwan FRC Graduates to spur alumni involvement with teams across Taiwan.

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 our club, we encouraged Rookies to voice their opinion, become leaders, and embrace STEM. To foster STEM in elementary and junior-high students, we taught topics ranging from Java to robot structures and provided hands-on experiences during community events, camps, and visits. Also, we formed Taiwan FRC Graduates for alumni to pass down expertise to all 38 teams in Taiwan. Thus, with the Southern Taiwan Science Park, we propelled STEM in Taiwan and allowed students to chase their dreams.

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

As NNKIEH is in the Southern Taiwan Science Park, we received sponsorships from 20+ companies and the Ministry of Science and Technology. We also secured 359,690 USD to establish the Nanke FRC Robot Base to train future STEM leaders and spread FIRST in our curriculum. Using the money, we created construction spaces with specialized engineering equipment. Moreover, we partnered with the Tree Valley Life Science Museum: the museum funded our projects, and we designed the museum's camp classes.

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

Our mission statement is to make STEM accessible to all. 6998 is an inclusive community with a 50-50 gender split, and more girls join and lead our subgroups every year. Last April, 6998 was a finalist at the 2021 Girls in CyberSecurity competition, shattering misconceptions that girls could not excel in STEM. Through fundraising, we also donated 1,800 USD to underprivileged families in our community and provided scholarships so all could pursue STEM regardless of economic circumstances.

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

With a government sponsorship of 269,760 USD, we introduced FIRST to our school's elementary and middle school students through FLL and FTC. We also expanded networking and collaboration with companies, the government, the Southern Taiwan Science Park, and domestic and international teams. To ensure long-term prosperity of the Taiwan FIRST community, we passed down leadership skills to our underclassmen, inspired schools to emulate our STEM-integrated curriculum, and assisted teams in need.

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

Sharing our initiatives, we request sponsors through visits, emails, phone calls, and our award-winning business plan. To retain and engage our sponsors, we promote the companies at events, provide semiannual updates, host/run sponsor appreciation parties, lend venues for Tree Valley camps, and embellish uniforms and robots with sponsor logos to showcase at competitions and fundraising events. We also encourage friends, family, school faculty, alumni, and the PTA to support our future endeavors.

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

Sustaining team engagement is one area 6998 seeks to improve. Worn out by academic pressure, our members struggle to remain dedicated. Thus, we held 48+ hrs of interactive PBL during summer camps so members do not feel like they are falling behind. This year, we instituted an induction ceremony with mottos that remind us to contribute to our community. Also, members lead events they truly are passionate about. During the season, we go on field trips and parties to bond as a large, loving family.

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

6998 fostered youths in our community to contribute, develop passions in STEM, and become science and technology leaders. Besides strengthening existing teams through mock competitions and assisting teams through alliances, we expanded ties with the government and the science park that later supported future FIRST teams. Most uniquely, we established Taiwan FRC Graduates to ensure that FIRST alumni from Taiwan play an integral part in a cycle of mentorship and prosper into confident leaders.

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.

In 6998, we share a passion for STEM and a commitment to FIRST. We all feel like we belong, especially those who do not fit into Taiwan's education system. We accommodate diverse opinions and positively treat failure as a learning process, not an indicator of inferiority or a source of shame. We motivate one another to succeed through any highs and lows and celebrate our success in Kick-off and Chinese New Year parties. FIRST has been and will continue to be a life-changing bonding experience.

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MISSION STATEMENT:

6998 is a growing, loving family that passionately promotes FIRST through multifaceted, sustainable methods and positively impacts our community. FIRST is more than robots: it is about forming everlasting bonds with other teams, cultivating the best in all our members, spreading the access to and fascination of STEM to all, and contributing back to the community.

Through FIRST, we transform Taiwan's suffocating traditional education system that stifles creativity and imagination. We expose Taiwan to STEM education and motivate students to learn through application, not memorizing textbooks. We stand by our motto to "not just build robots, but also build great people."

Our mission is three-fold: (1) transform Taiwan's traditional education system by spreading STEM and FIRST, (2) instill good virtues, contributions, and applicable skills in students and our community, (3) make STEM accessible to all.

FROM HUMBLE BEGINNINGS TO A SCHOOL-WIDE STEM MOVEMENT:

What started as the culmination of the sweat and tears shed by 13 diligent students in our Rookie year resulted in a visit to the Taiwan Presidential Office Building for winning the Entrepreneurship Award at the Hawaii Regional and for spreading STEM education in Taiwan. Inspired by our success, our school NNKIEH, the Southern Taiwan Science Park, and the Taiwanese Ministry of Education wholeheartedly supported our school-wide STEM initiatives.

The Southern Taiwan Science Park funded 359,690 USD to establish the Nanke FRC Robot Base and five self-made bases, with equipment for high-level robot trials, at our school to train innovative talents for future generations. We also offered STEM classes like the AI Robot elective course that encourages youth to apply technology to solve today's problems and enhances their understanding of robots, AI/AR/VR, IoT/Big Data, and unmanned vehicles. From most students previously studying humanities elective courses, now at least 67% of FRC club members participate in the AI Robot Elective Course. Shattering the standard for Taiwanese students, our school's students enrolled in prestigious Taiwanese universities through special admission programs for excelling in STEM and FRC.

To expose students to STEM from a young age, 6998 partnered with our school to start an FLL program for elementary school students and an FTC program for middle-schoolers, becoming the only public school in Taiwan to have FIRST clubs spanning from elementary to high school! From helping with the official registration process to navigating the competition, we cultivated a passion for STEM in our underclassmen, and they will be embarking on their first Regionals next month after months of preparation! 6998 established a sustainable environment for self-development and innovation by youth in STEM.

STRENGTHENING THE ASIAN FIRST COMMUNITY:

Our STEM-integrated curriculum went on to inspire schools, teams, and educators across Taiwan, and many who visited our workplaces or attended our activities established FRC programs. Although schools in Southern Taiwan receive less funding and resources compared to schools in the North, we constantly implement new ways every year to expand our initiatives in spreading and strengthening the FIRST community in any way, shape, or form.

In our Rookie year, we founded the Southern Taiwan Alliance to promote FRC and provide advice to schools in Tainan and Kaohsiung of Southern Taiwan. We maintained regular contact through video chats, emails, and exchanges to help other teams creatively and sustainably grow their FIRST initiatives. Since then, this project has expanded to FRC teams all across Taiwan and Asia.

We posted videos of presentations on Java/Solidworks programming and robot building in Chinese on our FRC 6998 and Taiwan FRC Graduates YouTube channel, greatly helping teams in Asia that struggle from daunting language barriers of comprehending English. Treating all with professionalism and respect, we ran/hosted mock competitions with 20+ teams and 300+ participants to ensure teams could reach their potential at official FIRST events. On Kickoff Days, as the leading FRC team in Southern Taiwan, we were one of the teams that led discussions with teams all over Taiwan to discuss future endeavors and strategies for the new season! Besides providing expertise, we additionally lent our Nanke FRC Robot Base and self-made construction spaces to FRC teams challenged by financial constraints to build their robots.

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We ran workshops and attended exchanges with 20+ teams in Taiwan, especially Rookie teams, to share our experiences and guide them through the season on aspects such as member recruitment, programming, and award submissions. During exchanges, we conducted hands-on activities with and introduced Project-Based Learning to FRC teams from Macau and Japan. We aim to expand our exchanges to more teams across Asia to further challenge the traditional educational system in Asia that defines a student's self-worth on academics, inspiring a new generation of STEM leaders.

PROMOTING SUSTAINABILITY OF OUR PROJECTS:

6998 is dedicated to ensuring the sustainability of our initiatives and those of the Taiwan FRC community. During club meetings and after competition seasons, we conduct SWOT analysis discussions, seek ways to grow our programs, and identify areas to improve on in the future. Through engaging with sponsors and companies, we also fundraise 17,980 USD annually to expand our future programs.

Through multiple discussions, we realized that student-led leadership in subgroups (of engineering, programming, financials, public relations, media image, paperwork, and artistic design) was not enough. Thus, in 2021, we formed the Taiwan FRC Graduates (sponsored by the Southern Taiwan Science Park) to promote a cycle of mentoring and foster alumni involvement in the Taiwan FIRST community. Becoming confident mentors in STEM through Taiwan FRC Graduates, alumni from FRC teams in Taiwan to provide expertise and share their experiences to all 38 teams in Taiwan.

TRANSFORMING THE CULTURE OF STEM IN OUR COMMUNITIES:

6998 believes that individual growth carries little significance if it is not harnessed to galvanize a positive cycle of problem-solving that spans entire communities. Using our resources wisely to grow future initiatives, 6998 inspired the love of STEM in the general public and students of different backgrounds.

During camps at the Tree Valley Life Science Museum and annual Mega Maker Day, we teach elementary and middle-schoolers how to build, program, and operate robots. People of all ages also attended our annual workshops, exhibitions at city centers, and community events. We also spread FIRST through news media and video promotions. Through these efforts, we recognized the importance of branding and PR to successfully engage with the public; later, we learned how to package and make the message of FIRST digestible. Writing an email to the President of Taiwan and later receiving an invitation to the Taiwan Presidential Office Building, our team inspired prominent government officials to spread FIRST and STEM education in Taiwan. Bringing the public along our FIRST journey, we showcased FIRST and the application of STEM as a problem-solving mechanism, building a solid partnership with our community.

In 2020, we designed a pandemic prevention robot that sprayed alcohol and conducted temperature checks to make tedious pandemic prevention efforts fun and spark interest in STEM! We stationed our robot in our school every school day morning and at local train stations in Tainan on weekends. This year, we taught Java programming and 3D printing at disadvantaged middle schools, transforming youths' lives through education. We also donated 1,800 USD to underprivileged families through fundraising efforts and provided scholarships to students in our community so all could pursue STEM regardless of economic circumstances. We hope to expand the scope of our current community outreach and volunteerism projects in the years to come.

6998 sets a precedent for the Taiwan FIRST community: we inspire youths to break the boundaries of the Taiwan educational system, conquer the impossible, and chase their dreams on the global stage through STEM. By helping teams and spreading STEM through community outreach and volunteerism, we have instilled a new culture of STEM in our school and our communities.

Changing Taiwan's education system, inspiring a new generation of STEM innovators, and spreading FIRST and STEM has been challenging. However, it is genuinely worthwhile.