

Chairman's Award - Team 6014

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2020 - Team 6014

Team Number

6014

Team Name, Corporate/University Sponsors

Zorlu/Inveon/Donmez Debriyaj/CitusData/LCWAIKIKI/Bosch/NETAS/Sabancı Holding/Fikret Yuksel Foundation&Robert College

Briefly describe the impact of the *FIRST* program on team participants within the last five years.

95% of our members got involved in international STEM education programs, receiving 2 patents and publishing 10 research papers, 1 being on FRC Turkey. 60% of our team discovered their interest in STEM in ARC, 85% pursuing careers in STEM fields. Our members took part in science competitions, became FRC&STEM tutors&attended internships. FRC and its warm, gracious professional environment inspired us all to take risks&be creative and lead us to be dancers, actors&artists as well as competitive engineers.

Describe the impact of the *FIRST* program on your community within the last five years.

Turkey was introduced to FIRST 5 years ago, ARC was among the first ones. After going to abroad for competitions, we realized an existing gap between the perceived FIRST values and real message. Fully understanding the gap after writing a research paper about perceived FRC messages, we worked to close it, conducting projects, conferences, and collaborations with other teams. Now, Turkey is the 3rd country with the most teams, and most importantly, an environment with internalized FIRST messages.

Describe the team's methods for spreading the *FIRST* message in ways that are effective, scalable, sustainable, and creative.

Sustainably spreading the FIRST message requires a deep understanding, so we wrote a scientific research paper on FIRST's impact on people&published it in an international US journal, "TechTrends". Fun&innovation are the basics of effectively inspiring children so we designed Arcopolis, ARCards,&Arc Up! We used them in Anatolian Maker Movement in 20 cities, teaching 3870 children about STEM. We published a storybook in 8 languages, which inspires children around the world about the power of STEM.

Describe examples of how your team members act as role models and inspire other *FIRST* team members to emulate

GOAT 8092, a team we started&mentor, regularly visit our school, and we show them our presentations about FRC values, awards, projects, fundraising, mechatronics, and programming to assist their journey. After founding RAMs 7729, we organized two conferences on FRC&STEM with them, reaching a total of 1000 high school students. For all teams to emulate and learn from our experience, we publish informative "Footprints" videos about FIRST every week on YouTube, and collaborate with teams daily on Instagram.

Describe the team's initiatives to help start or form other FRC teams

After working with SPARC for a year and helping 82 students from 10 schools to be immersed in FIRST, we parted our ways, believing they are experienced enough to continue & spread STEM on their own. We further founded/mentored RAMs 7729, ENKA Tech 6985, Adapazari ENKA 8011, UAA Tiger 7228, Roctopus 7134, Mevolution 7758 and 6414, Oksef 7140, Zmir Girls 7544, Bilsem 8181, Borusan 4972, X-SHARC FRC 6838 & GOAT 8092 teams, which have participated in various competitions to receive awards.

Describe the team's initiatives to help start or form other FIRST teams (including Jr.FLL, FLL, & FTC)

We started and mentored Hypers and Spartans. Through annual events such as RC Maker Faire and Code Week, we encourage 900+ middle schoolers to build and create through our FLL presentations and workshops. Our team consists of 18 residential students who give FIRST and FLL presentations to middle schoolers to mentor & inspire children in their hometowns all around Turkey. Our site SpreadtheFIRST.com, explaining how to establish an FRC or FLL team, has accumulated over 6000 clicks in 4 years.

Describe the team's initiatives on assisting other FIRST teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the FIRST program

Each season, we help translate the Game Manual to Turkish, publish Turkish programming resources on our site and volunteer in FLL, FLL Jr & FRC events. During the build season, we invited RAMs 7729 to our school and helped them with their building process, while assisting 50+ FLL, FLL Jr & FRC teams with tutorial videos, video calls, chats & lending materials; including teams 7469, 6459 & 6024. We reach & mentor more teams with our "Footprints" tutorial videos on YouTube, which have reached 1100 individual views.

Describe how your team works with other FIRST teams to serve as mentors to younger or less experienced FIRST teams (includes Jr.FLL, FLL, FTC, & FRC teams)

We mentor GOAT 8092 through their regular visits to our school and our presentations about FRC & STEM. In collaboration with RAMs 7729, we organized 2 conferences, mentoring them on the logistics of such an event. We publish informative "Footprints" videos about FIRST every week on YouTube, and collaborate with teams daily on Instagram. Our team's residential students make FLL-FRC presentations in their hometowns. We also created a page where teams collaborate for materials and projects.

Describe your Corporate/University Sponsors

Our biggest sponsors—including Zorlu and Inveon—not only support us financially, but also give us mentorship through workshops. Our partnership is mutual; we also play an active role in their community involvement projects, tutoring & assisting. Keskin Color supports us by printing our posters & manufacturing the games that we design, allowing many children to be inspired by FIRST, through our Anatolian Maker Movement project. Papa John's supports our conferences and competition performance by providing food.

Describe the strength of your partnership with your sponsors within the last five years.

Our relationship with our sponsors is not only through finance & material but it is also strong, one-to-one & sustainable. We hold annual dinners, invite them to our conferences as speakers, and participate in their events, such as Zorlu's annual safety workshops. We are in partnership with "Cirak Atolye", who provides books about coding for kids we reach through Anatolian Maker Movement. This mutual commitment results as a strong, constructive support network between us and our sponsors.

Describe how your team would explain what FIRST is to someone who has never heard of it

Imagine a table full of delicious food. Now imagine robots on a competition field or STEM projects reaching limitless audiences. You may ask; what do they have in common? A large family behind these great works, ready to enjoy what they have created with collaboration & hard work. FIRST, inspiring many people with various backgrounds & talents and building life-long relationships, ensures that each person will have a unique ingredient to add up to the meal to nurture the family with love & passion.

Briefly describe other matters of interest to the FIRST judges, if any

We're constantly asked why our color is pink. We accept pink as "not a color, but an attitude." As only 13% of practicing engineers are female, we as 6014 have tried to overcome this by juxtaposing things that are perceived masculine and feminine. We showed this in our creative style: wearing our pink hoodies and waving pink dragon flags. If you want to explore our passion further, you are more than welcome to visit our pink pit, guarded by our pink dragon to play Arcopolis, ARCards, or ARC Up!

For FRC teams older than 5 years, briefly describe your team's broader impact from its inception.

Though Turkey is the 3rd country with the most teams, after competing in Houston, we realized cultural obstacles between some FRC values and Turkish culture. To understand how the concept of FRC is perceived by Turkish participants, we wrote a research paper—the first ever to be written by a team. In our paper, we tangibly analyzed the participants' change through interacting with FIRST; and inspired people by discussing possible next steps, which helped FRC in Turkey improve significantly.

Team Captain/Student Representative that has double-checked this submission.

Handan Dilara Bikmaz

Essay

DISCOVERING ARC

When we were founded 5 years ago, we were the only STEM club in our school, & one of the few FRC teams in Turkey. Since then, our main mission has been to introduce FIRST & its message in order to spread STEM, expanding our outreach circle every year.

TEAMWORK & INCLUSION

Collaboration within Our School:

We founded RCMakers, AR/VR, iOS, Android Development Clubs. Then, collaborating with the clubs we've established in the previous years, we started annual RC Code Week, RC Maker Faire & SumoRobot competitions, reaching 2000+ students, both in & out of our school. In each club, there are approximately 30 participants, cumulatively we reached 600 students over the past 5 years.

STEM Like a Girl:

Last year, when we were looking for new members, the applications to our team consisted only of 35% female members, which indicated an unacceptable imbalance in the encouragement of females & males in STEM world. For more female students to get involved with STEM, we decided to conduct another selection round, open only to female students. Not only did we try to break the prejudices & introduced FIRST to many skillful females but we also obtained a balanced gender distribution in our team.

SPREADING FIRST

Research Paper:

In order to spread the FIRST mission, it was crucial to understand & demonstrate its effects on individuals clearly. To present concrete evidence about FIRST's positive impacts, we wrote a scientific research paper about FIRST's positive impacts on individuals: "Determination of Turkish FRC Participants' Perceptions Towards FRC via Metaphors & Construction of a Novel Mind Map." It's the first Turkish research paper about FRC that has been published in an international journal, "TechTrends," in the USA. . The paper involves a concept map about FRC Turkey, visualizing FIRST values that FRC Turkey participants own, using data from 282 people. With this research paper, we set an example for other researchers & helped emphasize the importance of FIRST.

To make a juxtaposition between FIRST's mission and FRC Turkey participants' understanding of it.

Teams We Started/Mentored/Assisted/Collaborated with:

Emphasizing gracious professionalism in every aspect of our team growth & outreach, we prioritize starting, mentoring, assisting, & collaborating with teams around the world. We worked with SPARC 5665 for a year, helping 82 students from 10 schools to get involved with the FIRST program. After being sure that the schools became self-sufficient to compete & spread STEM on their own, we parted ways & encouraged them to found their own teams.

We've started/mentored FRC teams RAMs, GOAT, Adapazari ENKA, UAA Tiger, X-SHARC, Roctopus, Mevolution, Oksef, ?zmir Girls, Bilsem, Borusan Robotics; and FLL teams Hypers, Spartans. In addition, we mentored a VEX team Pre-Dators. During the build season, we invited RAMs, who didn't have a space to work, to our school & helped them with their robot. To enrich the FIRST experience of others & assist them, we constantly provide tutorial videos & make video calls with many teams. We assisted teams such as 7469, 6459, 7035, 6024, 7297, 4191 & 6038.

The teams we've collaborated with include BannerLords, Gultepe Robotics, NeuraBlink & RAMs, with whom we organized a conference named "Illuminating STEM", reaching more than 300 participants.

Conferences:

Our first conference last year was called "(In)Equality in STEM". We've inspired people to overcome inequalities in STEM by destroying the prejudices towards genders & crossing the boundaries of unequal resources (visit: bit.ly/arcinequality). Building on the impact we created last year, we organized "Technology for Social Good" conference this year, hosting 5 expert speakers in science & technology fields (bit.ly/arctechnology).

In both conferences, we held problem-solving workshops, design thinking studios, and hosted guest speakers, encouraging people to find creative solutions. We are extremely proud that through these 2 years, we reached nearly 700 participants.

"Footprints" & "Writing Archive":

To assist as many teams as possible & help them begin their path, we made tutorial videos available to everyone on topics like starting a team, finding sponsors, programming in different languages & discovering motor types. We publish these videos on YouTube, reaching 600+ views, providing Turkish content to teams.

With the aim of spreading the FIRST values to even more people, we designed the website "SpreadTheFirst.com" that informs people about how to establish an FRC/FLL team, receiving 8000+ individual views.

Likewise, with our Instagram Writing Archive, we share Instagram stories weekly about our teammates' experiences about robotics, FIRST or STEM. Thanks to our active Instagram use & followers, we reach 2400 people with each post.

Essay - page 2**INNOVATION & FUN**

With the innovative & fun games that we have designed, we taught different aspects of STEM to 400+ children from all over Turkey.

Arcopolis:

The main purpose of "Arcopolis" is to teach children about engineering with fun facts & pictures. The game involves questions about inventions & engineering such as, "What was the name of the first space shuttle?" After playing our game in one of the Anatolian Maker Movement Projects, a kid told us, "Even though I didn't win the most ARC coins, I won because I learned the most." Moments like this are great motivation for us to keep creating, building & sharing.

Arc Up!

We've developed a mobile game called "Arc Up!" inspired by "Heads Up!" It's a game that consists of several categories of words, related to STEM & FIRST. The game teaches children the basic terminology of robotics & FIRST. It's currently published on the Google Play Store.

ARCCards:

To introduce important scientific findings & their inventors to children, we designed & produced our own "Top Trumps Card Game" about important scientific figures & their characteristics. The cards that also include biographies of them have been very useful in informing children through a little bit of competition & a lot of fun during the AMM projects.

ARC Science Magazine:

Last year, after realizing that we do not have a journal focusing on STEM in our school, we started to publish ARC Science Magazine, which consists of scientific articles written by us, interviews with our expert science teachers & news regarding the technological world.

IMPACT ON ANATOLIA: ANATOLIAN MAKER MOVEMENT

To reach out to Anatolia, we started the Anatolian Maker Movement (AMM), visiting schools in 20 cities including Eskisehir, Mersin, Kars, Edirne, & Balikesir reaching 3870 kids. In our projects, we provide Scratch, coding, & game design education to kids, assisting them to learn about STEM through the informative games that we created. While they have fun playing these games, they also learn about influential scientists & engineering tools in an effective way. So far, 400 children in 4 different projects have learned from these games, & they are all donated to each school we visit. In every school we go, we also bring at least 100 books with us, which we gather from our schoolmates, team members, & sponsors. Our sponsor & partner Cirak Atolye provides us with STEM-related books for children to be used & distributed in our projects. Until today, we've established 17 libraries, donating 2000+ books in the cities where we execute our projects.

To get more information about our project, you can visit <https://bit.ly/2D8bUBu>

IMPACT ON EVERYONE

To extend our outreach circle even more, we wrote & published books called "Women & Science Stories," which consists of biographies of successful women in the STEM field, & "Small Robot's Big Ideas", combining famous tales with fun adventures involving robotics to bring children's attention to STEM.

In collaboration with FRC teams around the world, we translated our books into 8 languages: Hindi, Chinese, Arabic, English, French, German, Portuguese, Bulgarian, Turkish. In order to spread them, we donated the hard copies to the schools we visited through AMM. Then, we converted it to audiobook & animation, publishing on our YouTube channel. In order to overcome all obstacles, we also made digital copies of it in the new Braille devices, the first in Turkey. Similarly, in partnership with Tribeca & Kahve Dunyasi, we produced Braille menus, which are currently in use in these cafes. We've also appeared on Fox TV with our Braille menu project, inspiring 20 million+ people about the FIRST values. Currently, we are in contact with 3 other cafes, in the aim of extending our project.

FUTURE PLANS & SUSTAINABILITY

We formulated a 5-year sustainability plan for our current projects.

-Research Paper: We will extend our research to other countries with a comparison study, elucidating the effect of FRC on students from different backgrounds.

-STEM Conferences: We will continue to hold our STEM conferences annually, widening our intended audience, & we hope to have even more participants.

-Books: We aim to write at least 3 new books, again translating to many languages as well as to the Braille alphabet.

-AMM: Reaching at least 7 new cities each year, we plan to extend our reach to 52 cities over the course of 5 years.

-Arcopolis & ARCCards: In partnership with Keskin Color, we'll start mass production of both of the games and, we'll donate more of them to each school we reach.

-ARC Science Magazine: We'll continue to publish our magazine in our school semi-annually, & in the future, we plan to even cross the boundaries of our school, starting to distribute it to the other schools.

**As we continue to build our community, we improve our abilities while impacting many young leaders, & we'll continue to grow this amazing community together. Our biggest aim is to eliminate all the limits of our outreach, & to bring FIRST to the "infinity & beyond".