



FIRST GLOBAL

2021 Impact Report



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On the cover: A global portrait of 2021 *FIRST* Global Challenge teams demonstrating their solution project themes in the areas of Education, Environment, Health, and Economy.

FROM OUR FOUNDER

Greetings to all of our *FIRST* Global supporters around the world. I want to express my deepest thanks to all of you for making another year possible. Especially in times such as these, we see that even though talent is equally distributed among all kids in the world, opportunity is not. *FIRST* Global is the solution to closing that gap.

Despite the continuing pandemic, in 2021 we furthered our impact with new and exciting initiatives. *FIRST* Global youth from 176 nations were empowered by the tools of STEM to identify opportunities when others saw problems, and to be pioneers in STEM frontiers.

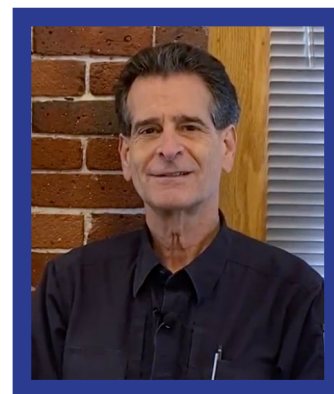
Teams worked together under the theme of “Discover & Recover” to innovate real solutions to problems faced in their communities through the Solutions Challenge, collaborating by forming alliances beyond assumed barriers of language, culture, and geography. Teams additionally polished their robotics skills by building robots equipped to complete tasks for the Robotics Challenge. This season we also opened a new domain for participants through the CubeSat Prototype Challenge, with several teams being the first youth in their country to launch their own nanosatellites into the atmosphere. We’re also proud to have launched the first-of-its-kind virtual robot-building tournament, the *FIRST* Global RoboCo Challenge, where teams designed and built robots in the sandbox game world of RoboCo for service and industry applications. This is just the beginning

of an exciting and expanding world of opportunities in the field of robotics and educational gaming for youth worldwide.

Throughout all these activities, participants have seen on the one hand how they can compete, each delivering better ideas than the next team. But more importantly, how they can work together. Realistically, we’re all on the same team. We’re all competing with global pandemics, climate change, food and water shortages, needs for education, economic equality, social justice, security, and much more. We need to make STEM opportunities like *FIRST* Global available to all kids around the world, so they can all participate in solving their own problems, and cooperate with each other to solve the world’s problems. *FIRST* Global is a testament to the power of teamwork and working together to make a positive change in the world, for today and the future.

As we work to broaden our initiatives and make 2022 an even better year, you have the opportunity to be part of that positive change. Can we count on your support?

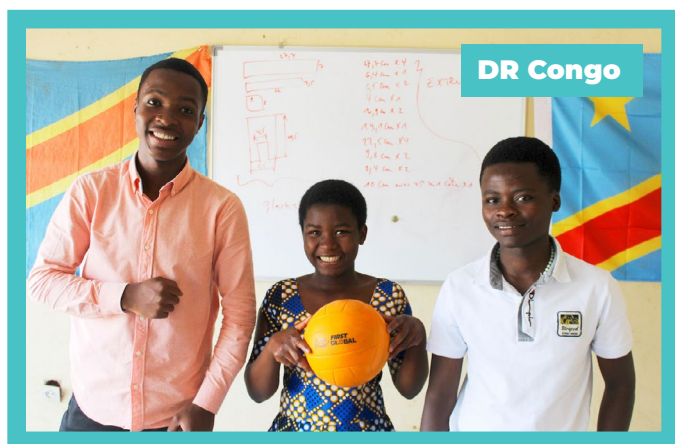
With thanks,
Dean Kamen



[SUPPORT NOW >](#)

OUR MISSION

is to inspire leadership and innovation in youth from all nations by empowering them through education in science, technology, engineering, and math (STEM).



We build the next generation of global leaders by connecting youth worldwide to work together in innovating solutions to global challenges.

The *FIRST* Global Challenge is our key mechanism for accomplishing this. It brings together students from nearly every nation in an olympics-style robotics event themed around an issue of global importance.



[LEARN MORE ABOUT US >](#)

2021 FIRST GLOBAL CHALLENGE

The 2021 *FIRST* Global Challenge focused on advancing new ways STEM can prioritize practical solutions and counter the effects of the problems youth and their communities continue to face across the world. Under the theme of “Discover & Recover,” the virtual Challenge consisted of three main components, enabling students to strengthen their technical and soft skills, as well as bring benefit to their communities.



Solutions Challenge

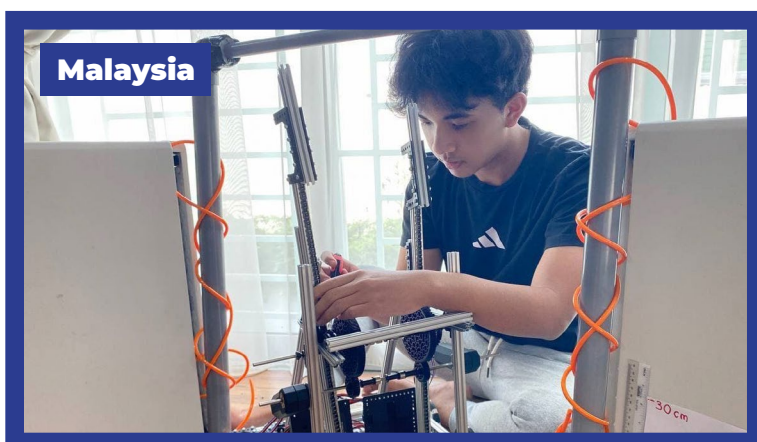


Teams identified problems in their communities in the areas of education, environment, health, or economy, and then created a project to solve it using STEM. They then collaborated on international alliances to augment their work and come up with global solutions.

Cubesat Prototype Challenge



Teams used components from a provided Arduino-based kit to design and build a nanosatellite prototype and launch it into the lower layers of Earth’s atmosphere.



Robotics Challenge



Teams reinforced their robot design, build, and programming skills using a standard REV Robotics kit of parts to complete four individual build tasks representing different components of a *FIRST* Global robot.



And They Persevered — The *FIRST* Global Afghan Girls Robotic Team

FIRST Global Team Afghanistan has continued to inspire ever since their debut in 2017. Although team members have changed over the years, they've had the same mission and continued dedication — to pursue education in order to serve others and solve problems in their community.

Team Afghanistan's activities were disrupted in the middle of the 2021 *FIRST* Global Challenge, and with no internet and limited ability to even leave their homes, they faced immense barriers to continuing their participation. Despite these many reasons to drop out of the competition, they persevered forward. They had to continue their education.


“We wanted to show the world that girls have abilities, and all the Afghan generation have abilities, they just need the facilities to make a big change in the world,” said

student-turned-mentor Somaya.

The all-girl Afghanistan team made the difficult decision to leave their home country, families, friends and previous robotics work all behind.

Upon their arrival in Doha, the girls enrolled in school to continue their studies, while *FIRST* Global Team Qatar helped them settle in, receive their kits, and gain access a dedicated workspace with the tools and equipment they needed.

Inspired by their perseverance and furthering of *FIRST* Global values despite extraordinary obstacles, *FIRST* Global judges gave the team special recognition during the 2021 *FIRST* Global Challenge Celebration by awarding them the Judges Award.

 Find the full story [here](#).



FIRST Global Team Honduras — Sowing STEM in Rural Honduras

In the Intibucá region of the Honduran mountains, quality education can be difficult to come by. More than half the population of Honduras lives below the poverty line, and the net enrollment rate in secondary school was only 43% in 2020. But for one group of teenagers, these challenges aren't a setback — they're motivation. It all started when they were introduced to robotics in 2017.

For the 2020 *FIRST* Global Challenge, the team reached out to a government official to pitch how they could work together to further STEM education opportunities. The government agreed to help build the first technological center in their region, which they estimated would benefit more than 2,000 students. The team continued their work, and in June 2021 the center opened.

As part of Team Honduras' project for the

2021 *FIRST* Global Challenge, the team's newest members focused on expanding the center's capabilities by creating a variety of resources and training materials to not only teach kids in their area, but to also train teachers in STEM education and robotics at schools throughout the region.

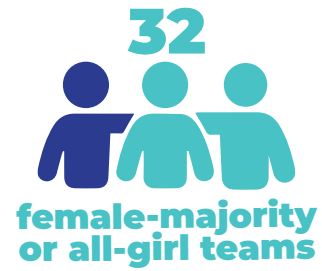
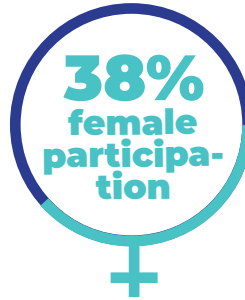
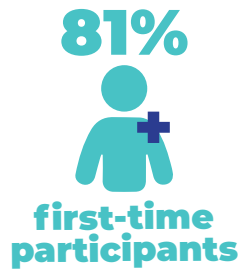
This is just the beginning. Each team member has their own life mission, and whether that's to pursue higher education, to teach, or to have a career in technology, it's rooted in a desire to serve others.

“By supporting *FIRST* Global you would be supporting many young people to be able to believe in themselves and make a change in themselves, in the community, in our country, and even around the world,” said 2019 team member Dulce.

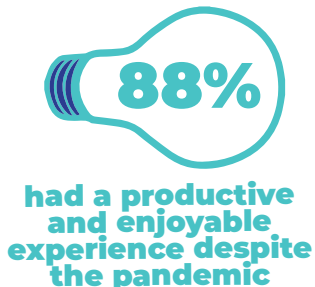
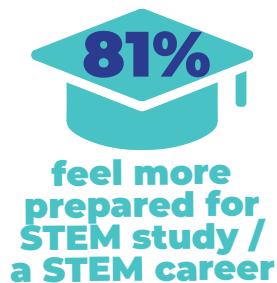
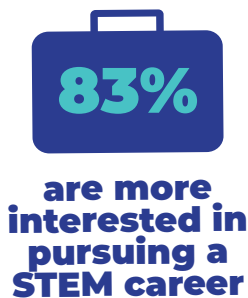
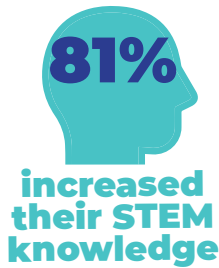


Find the full story [here](#).

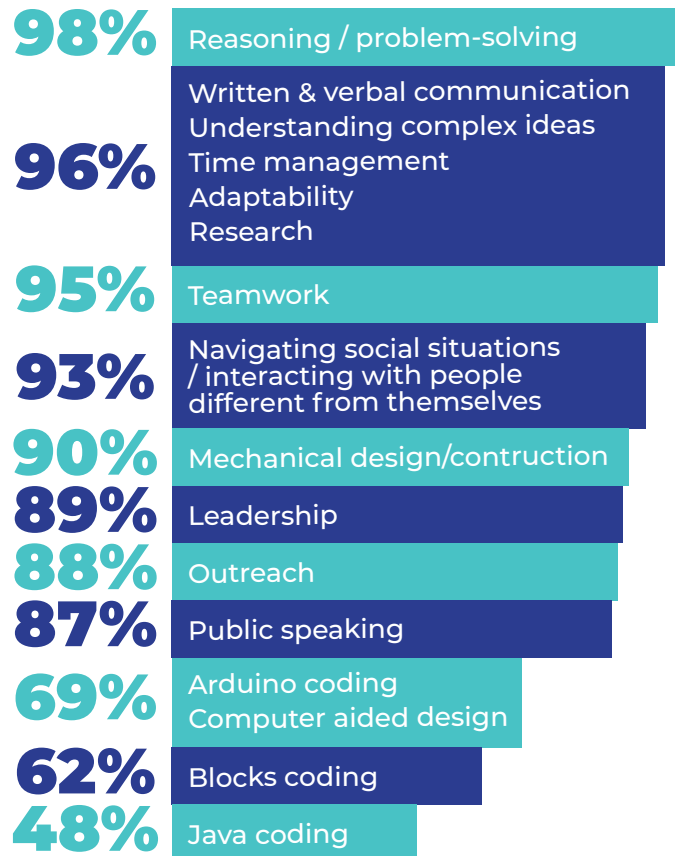
FGC BY THE NUMBERS



Through participating...



Students improved in...



Data sourced from *FIRST* Global participant self evaluations.

“ I consider the *FIRST* Global Challenge the most rewarding experience that I had in high school, since I had the chance to contribute to solving a pertinent issue in my community. We started as 10 high school students but **we finished as confident and collaborative individuals that made a change in our country**, showing what can be achieved in just 3 months. Thank you for this challenge!

—Brianna, Team Romania



The Power of STEM

Empowering the next generation with the tools of STEM unlocks a world of possibilities. Students combined their voices to share what STEM means to them in this powerful video.



A WORLD OF IMPACT

“ I think the Solutions Challenge is probably the most important part of the project, because young people from all over the world get together, share their ideas to solve global problems, and exchange with others to be able to have the best possible solution.

- Male student, Team Canada



“ It is one of the best competitions worldwide because young people feel part of the implementation of new technologies for today. Through it we learn about the social and global problems that affect us and that **with STEM we have solutions.**

- Female student, Team Honduras



“ The *FIRST* Global Challenge changed me into a completely different person, someone who is confident in their abilities and can easily integrate into their society.

- Male student, Team Tunisia



“ It was a once in a lifetime experience that I will never forget! I learned a lot, met new people, and I had amazing personal and technical growth.

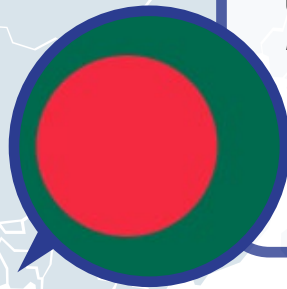
- Female student, Team Brazil



“ Seeing the work every teenager across the globe puts into this challenge inspires me to work harder and gives me so much hope for the future! It makes me believe that **we are the generation that will change the world for the better!** The most important thing about *FIRST* Global is that it brings together people from all over the world! - Female student, Team Greece



“ It’s important to provide a platform for students to discover their passion for STEM while simultaneously showing them how to be globally conscious and contribute to their communities. [The *FIRST* Global Challenge has] shown me how STEM can be used to be a force for good. - Male student, Team Bangladesh



“ The *FIRST* Global Challenge seriously **changed my life** in 2021. I thought 2021 was gonna be a bad year because of COVID-19, but somehow joining the *FIRST* Global Challenge made me explore, learn, and improve. - Female student, Team Cambodia



“ I was not sure whether to pursue STEM careers because I didn’t believe I could do it, since in our community they believe it is for males. But after my experience with the 2021 *FIRST* Global Challenge, **I made up my mind and I’m going for it.** - Female student, Team Botswana



177 TEAMS

| | | | |
|--|---|---|---|
|  Afghanistan |  Bulgaria |  Djibouti |  Guinea |
|  Albania |  Burkina Faso* |  Dominica |  Guinea-Bissau |
|  Algeria* |  Burundi |  Dominican Republic |  Guyana* |
|  Andorra |  Cabo Verde |  Ecuador* |  Haiti |
|  Angola |  Cambodia* |  Egypt |  Honduras |
|  Antigua & Barbuda |  Cameroon |  El Salvador |  Hong Kong, China |
|  Argentina |  Canada |  Equatorial Guinea |  Hope* (Refugees) |
|  Armenia |  Cayman Islands |  Eritrea |  Hungary |
|  Australia* |  Central African Rep. |  Estonia |  Iceland |
|  Bangladesh |  Chad |  Eswatini |  India |
|  Barbados |  Chile* |  Ethiopia* |  Indonesia* |
|  Belarus* |  China, People's Republic of* |  Fiji |  Iran |
|  Belgium |  Chinese Taipei |  France |  Iraq* |
|  Belize* |  Colombia |  Gabon |  Ireland |
|  Benin |  Comoros |  Gambia |  Israel |
|  Bermuda |  Congo, Dem. Rep. of the |  Georgia |  Italy |
|  Bhutan |  Congo, Rep. of the |  Germany |  Jamaica |
|  Bolivia |  Cote d'Ivoire |  Ghana* |  Japan |
|  Bosnia & Herzegovina* |  Croatia* |  Greece* |  Jordan |
|  Botswana |  Cuba* |  Grenada |  Kazakhstan |
|  Brazil |  Cyprus |  Guam |  Kenya |
|  Brunei Darussalam |  Czech Republic |  Guatemala* |  Kiribati |

Due to varying circumstances, not every team participated in all activities.

*Participated in the *FIRST* Global RoboCo Challenge.

| | | | | | | | |
|---|---------------------------|---|---------------------------|---|---------------------------------|---|---------------------------------|
|  | Korea, Republic of |  | Mozambique |  | Rwanda |  | Tanzania |
|  | Kosovo |  | Namibia |  | Saint Kitts & Nevis |  | Thailand |
|  | Kuwait |  | Nepal* |  | Samoa |  | Timor-Leste |
|  | Kyrgyzstan |  | Netherlands* |  | São Tomé & Príncipe* |  | Togo |
|  | Laos |  | Nicaragua |  | Saudi Arabia |  | Tonga |
|  | Latvia |  | Niger |  | Senegal |  | Trinidad & Tobago |
|  | Lesotho |  | Nigeria |  | Serbia |  | Tunisia* |
|  | Liberia |  | North Macedonia |  | Seychelles* |  | Turkey |
|  | Libya |  | Norway |  | Sierra Leone |  | Turkmenistan* |
|  | Lithuania |  | Oman |  | Singapore* |  | Uganda |
|  | Madagascar* |  | Pakistan |  | Slovakia |  | Ukraine* |
|  | Malawi |  | Palestine* |  | Slovenia* |  | United Arab Emirates |
|  | Malaysia |  | Panama |  | South Africa* |  | United Kingdom |
|  | Mali |  | Papua New Guinea |  | South Sudan |  | United States of America |
|  | Malta |  | Paraguay |  | Spain |  | Uruguay |
|  | Marshall Islands |  | Philippines |  | Sri Lanka* |  | Uzbekistan |
|  | Mauritania |  | Poland* |  | Sudan |  | Vanuatu |
|  | Mauritius |  | Portugal |  | Suriname |  | Venezuela* |
|  | Mexico |  | Puerto Rico* |  | Sweden |  | Vietnam* |
|  | Moldova |  | Qatar |  | Switzerland |  | Yemen |
|  | Mongolia |  | Romania |  | Syria* |  | Zambia |
|  | Montenegro* |  | Russian Federation |  | Tajikistan |  | Zimbabwe* |
|  | Morocco | | | | | | |

Learn more about 2021 *FIRST* Global teams by viewing the [map on our website](#).

2021 FIRST GLOBAL ROBOCO CHALLENGE



The 2021 *FIRST* Global RoboCo Challenge, a first-of-its-kind virtual robot-building tournament, was a brand new way for *FIRST* Global teams to learn, engage with each other, and compete in a virtual environment.

RoboCo is a wholesome sandbox game about designing and building robots for service and industry applications to serve the needs of squishy, hapless humans in the world of tomorrow. This game concept is being actively developed by [Filament Games](https://www.filamentgames.com/) and is still many months from release to the public.

A total of 37 *FIRST* Global teams got a sneak preview! This is the first digital game-based challenge we have hosted. There are more features under development that will be included in the game in the future release. View the Challenge website, competition results, and broadcast links at www.fgrc21.roboco.co.

96%



want offerings like this in the future

87%



learned by virtually testing mechanical concepts

93%



had fun playing the game

86%



believe the game made STEM learning more accessible

“Applying your idea to a real-world robot without any programming... that was amazing!”



THANK YOU!



Special thanks to all of our sponsors, donors, mentors, volunteers, and everyone else who helped inspire the world's youth in 2021.



2021 *FIRST* Global Challenge Celebration

Make sure to check out the 2021 Celebration for some inspiration! Our emcees highlighted new initiatives, impactful projects, and announced the award winners.

