



The Innovators Circle

SINCE ITS FOUNDING 11 years ago by an aerospace engineer, Iridescent has focused on using engineering and technology for social change, transforming the opportunities available to disadvantaged young people—particularly girls—to reach their potential and impact their communities. The vehicle to achieving that transformation is an integrated approach to providing innovative science, technology, and engineering education to youth from low-income communities.

Low-income students face major barriers to a quality education. Insufficient public education funding, lack of access to high quality education, and language and

transportation challenges too often prevent these young people from attaining the education they need to enter a 21st Century workforce.

With a proven track record of stability, excellence, impact, and ability to scale, Iridescent has set an ambitious goal: grow the number of our program participants—K-12 students and mentors—from 15,000 participating each year in 2016 to 86,000 a year in 2019. To meet this goal, we are launching the Iridescent Innovators Circle, a 3-year, \$1 million campaign to help us sustainably scale our work in the U.S. and in key developing countries.



THE IRIDESCENT INNOVATORS CIRCLE

Iridescent’s mission is to empower the world’s most underrepresented young people, especially girls, through engineering and technology to become innovators and leaders. As a global engineering and technology education nonprofit focused on bridging the opportunity gap for this population, we are creating the Iridescent Innovators Circle to help us bridge the gap. This is an important opportunity for philanthropists and engineering and technology leaders to collectively tackle the critical issue of inequality in education.

Through a \$1 million campaign over the next 3 years, the Innovator’s Circle will be instrumental in helping Iridescent scale its core engineering and technology programs—Curiosity Machine and Technovation—to reach and mentor over 183,000 young people and girls in the United States and across the world by 2019.

Over the last decade, we have trained nearly 7,500 engineers and scientists to mentor 90,000 underrepresented students across 100+ countries. We have built strong relationships with more than 4,000 community partners worldwide, a key factor in maintaining a low cost per student contact hour (decreasing from \$34 in 2015 to \$9 in 2016).

But technology is changing and the demand for our programs is growing. With support from the Iridescent Innovators Circle we will build an Opportunity Fund with several key goals:

- Invest in research and development to keep ahead of the latest innovations, integrate them in our curriculum and determine metrics to evaluate the long-term impact of our work.
- Scale up regional staffing and outreach to families, schools and community partners to reach ~200,000 students, mentors and parents by 2019, while maintaining quality of the programs.
- Reduce cost to \$4 per contact hour by 2019.
- Increase retention of educators, mentors, parents, and alumni to 75% by 2019.



▲ Ivan began volunteering with Iridescent in Spring, 2012 and since then has participated, volunteered, and worked in every program Iridescent offered in New York City, mentoring over 500 children throughout the South Bronx. As a high school student, he helped build a solar-powered ice cream car and helped build a human-sized robotic face that was able to non-verbally communicate in real time based on human interaction. Ivan is now a senior at State University of New York pursuing a mechanical engineering and technology degree. He is also the Vice Treasurer of the National Society of Black Engineers. He was recently accepted into a summer internship program at U.C. Berkeley with the opportunity to work in an exoskeleton research and development group, assisting with the design, manufacturing, construction, and control of cable driven exoskeletons. In addition, he was invited to help redesign a robotic arm combining a Kinect 2 camera and a Wii Balance Board to do human modeling work at hospitals.



IRIDESCENT REACH BY YEAR
as of May, 2017



ADDRESSING AN URGENT NEED

In the U.S., public schools in marginalized communities serve predominantly Latino and African American children. Globally, in developing countries like India, too many girls from high-poverty backgrounds face gender, cultural and religious biases and, lacking social and economic supports, they often do not finish school.

In the U.S., the opportunity gap continues to grow in the most disadvantaged communities, in spite of years of education reform. The integration of engineering and technology into Common Core standards is challenging for educators in schools that are largely segregated by income and therefore also by access to opportunity and resources.

By 4th grade, many low-income students are already behind in reading and math. These are the students that are least likely to be exposed to engineering and technology in any meaningful way. They lack access to mentors and other educational programs and likely will not see engineering and technology as a career path. All of this contributes to the growing racial and gender gap in engineering and technology fields, where there is significant job growth potential, but a shortage of skilled workers. In a globalized world where innovation and technology is a driver of growth and opportunity, we are leaving behind an entire generation of potential leaders and innovators. For game-changing progress, we need each of these young innovators focused on solving some of the big challenges around clean energy, access to education, access to clean water, eradication of hunger, gender equity and sustainable cities to name a few.

“Through the support of women mentors at Iridescent, I gained the confidence to pursue my interests in STEM...Iridescent has empowered me to become an advocate in the world around me.”

–Casey Costello

Casey Costello (center) mentoring a younger student during a Curiosity Machine summer camp in 2014. Following her summer with Iridescent, Casey attended a seismic engineering camp at University of Southern California and joined her school’s robotics team. In the summer of 2017, Casey will be traveling to the Dominican Republic to work with a local diabetes organization to promote youth leadership, health, and happiness among young people with diabetes. ▼





WITH YOUR HELP, WE CAN CHANGE THIS NARRATIVE.

The Iridescent Innovators Circle will help us bridge the gender, racial and skills-related gaps in engineering and technology education that extend from kindergarten through college and beyond. By providing children with creative opportunities at an earlier age, we can develop more self-motivated learners who can keep pace with fast changing environments, learn new skills, continually innovate and solve many of the challenges we are unable to today.

AN INNOVATOR IN EDUCATION

At Iridescent, our core model engages engineers and scientists from industry, trains them to develop open-ended engineering and technology projects that they bring in-person, to K-12 grade students from low-income communities. Our engineering program is called Curiosity Machine (www.curiosity-machine.org) and focuses on K-12 girls and boys. And because we still have not achieved gender parity in any country in the world in leadership or entrepreneurship—especially in engineering and technology fields—we provide a specific program, Technovation (www.technovationchallenge.org) for older girls (aged 10-18) that focuses on technology entrepreneurship.

“Iridescent has empowered girls globally to tackle social challenges in their communities through technology...I’ve personally seen the confidence that girls have gained through this program in places like Bangalore to Silicon Valley.”

–Grace, Technovation Mentor and Senior Manager in a Silicon Valley firm

- ◀ Grace Akpoiroro, Student Ambassador for Technovation Nigeria speaking on a panel at Technovation’s 2016 World Pitch Summit, where finalist teams from around the world share the apps and business plans they created with mentorship from technology and entrepreneurship experts.

A team of Technovation students in India working together to build an app and business plan in Spring 2017. ▼





▲ Students from the Siyuan School in Zhumadian, China working on the *Build a Robotic Face* design challenge from Curiosity Machine.

▲ A group of students from Michelle Obama School of Technology and the Arts who participated in Curiosity Machine Family Science, an after school program where educators, parents, and engineering mentors work together to inspire students in STEM.

WHY IRIDESCENT?

Iridescent stands out in engineering and technology education programs through a unique business model:

Project-based: Our Curiosity Machine (CM) curriculum aligns with the Next Generation Science Standards (NGSS) for K-12th grade students using age-appropriate, low-cost projects to demonstrate the most cutting edge concepts in areas such as Artificial Intelligence, Nanotechnology, Biomimicry, Robotics, Satellite Systems and Precision Agriculture.

Mentor implemented: Iridescent facilitates robust training to engineering and technology professionals and university engineering students to mentor students through one-on-one support for CM projects, as well as for girls to design, build and pitch their Technovation Challenge projects.

Parent-engaged: Parent engagement is one of Iridescent’s unique qualities. We provide the tools for low-income parents to help their children develop critical thinking and problem-solving skills. Specifically, we support parents in building their own confidence in doing engineering and technology hands-on projects with their child, and by doing so, parents not only nurture their child’s capacity to think critically, but also learn how to develop self-motivated learners.

Impact-driven: Beyond our ability to disseminate engineering and technology learning programs to thousands of students globally, we have longitudinal data determining their impact. After participating in our programs:

- 89% of children are more persistent, less averse to challenges and understand science better [NSF funded 5-yr Longitudinal Study, EDC]
- 60% of girls enroll in further Computer Science courses after our programs
- 30% of girls major in CS in college—65x the national rate of U.S female college students (0.4%)
- 90% of low-income parents do more hands-on science projects at home [NSF funded 5-yr Longitudinal Study, EDC]
- 90% of engineers said that Iridescent’s mentoring programs increased their work-related creativity [The Business Case for Engineering Skills-based Volunteerism in K-12 Education, ASEE 2015]

FROM SCHOOL LIBRARY JOURNAL:

“Curiosity Machine is a Win-Win: A science program that is tied to the curriculum and the maker movement”

April 2017

“The creators of Curiosity Machine have accomplished the difficult: they’ve tied concrete science curriculum to the maker movement in a way that doesn’t dilute the free-form trial-and-error nature of the making process. While it may sound counter-intuitive, the best thing about Curiosity Machine may be the minimal instructions. Students are given the tools to plan, design, and test their structures, but the rest is up to them. It is expected that they will try, fail, and try again. The process-over-product approach, combined with inexpensive building materials and free educator resources, make Curiosity Machine an all-around win.”



▲ A mentor from NVIDIA introduces middle and high school students to machine learning concepts through hands-on design challenges.

“The past two years, I’ve gone from zero coding experience to teaching a group of underprivileged girls in my community how to code, starting my own company, and developing my app Cappable. Artificial intelligence is one branch of tech that I’ve been exploring through IBM Watson.”

–Soumya, Technovation 2015 Student Alumna

A Technovation team in Guadalajara, Mexico. ▼



▲ Soumya (center) participated in Technovation as a student in 2015, and has since started work on artificial intelligence by exploring IBM Watson. She hopes to integrate what she learns into her two mobile app ventures. Since participating in Technovation, she has been profiled in leading Indian newspapers, invited as a guest to IBM-India, and awarded the Rotary Young Entrepreneur Award.

▼ A Technovation team in Cameroon pitches their app and business plan to peers.



The Iridescent Innovators Circle



An Invitation Become a Founding Member of the Innovator's Circle

By joining Iridescent's Innovators Circle, you will position thousands of girls, low-income, and other underrepresented young people to become self-motivated, lifelong learners, courageous innovators and entrepreneurs.

To date, we have built an extraordinary program scale with a very lean staffing structure, investing most of our \$3.2 million budget into programs. However, to meet increasing demand, we must resource new and ever-changing technologies to keep our model ahead of the curve, while establishing new metrics to document our impact. It took us 12 years to reach our first 100,000 participants. We are on track to double that impact in a quarter of the time, aiming to engage ~200,000 participants over the next three years.

The Innovator's Circle is a vital opportunity to not only help close the opportunity gap for underserved young students, but to ultimately help us develop the most innovative problem solvers and leaders that the world so urgently needs.

Please join us!

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technovationchallenge.org



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