

Youth**Action**Net®

CASE STUDY SERIES

Fundación Ciencia Joven:

*Equipping Youth and Educators in
Latin America with Science and
Leadership Skills*

A partnership between:



GEORGETOWN UNIVERSITY

School of Foreign Service
Global Human Development Program



Introduction

This is one of a series of case studies produced by students enrolled in the Global Human Development Program at Georgetown University through its partnership with the International Youth Foundation. Students enrolled in a course exploring the role of social enterprises and social entrepreneurs were paired with young leaders of social ventures identified through the IYF's YouthActionNet® program. The students were given the assignment of analyzing the venture's assets, successful methodologies, and opportunities for investment to increase impact. Through this experiential learning process, the student consultants gained hands-on experience and exposure to the needs of social enterprises. The ventures, too, benefited from student insights into their strengths, areas for growth, and recommendations for enhancing their impact and sustainability. The Georgetown practicum is part of YouthActionNet's larger efforts to partner with institutions of higher learning around the globe to integrate social change into the academic experience and career interests of students.

International Youth Foundation

The International Youth Foundation (IYF) invests in the extraordinary potential of young people. Founded in 1990, IYF builds and maintains a worldwide community of businesses, governments, and civil society organizations committed to empowering youth to be healthy, productive, and engaged citizens. IYF programs are catalysts of change that help young people obtain a quality education, gain employability skills, make healthy choices, and improve their communities.

www.iyfnet.org

YouthActionNet®

Since 2001, YouthActionNet, a program of the International Youth Foundation, has provided founders of social ventures, ages 18 to 29, with the training, networking, coaching, funding, and advocacy opportunities they need to strengthen and scale their impact. These young social entrepreneurs have pioneered innovative solutions to critical local and global challenges, resulting in increased civic engagement, improved health, education reform, economic opportunity, environmental protection, and more inclusive societies. Our work is carried out through a network of 23 national and regional youth leadership institutes that collectively support over 1,350 young social entrepreneurs globally.

www.youthactionnet.org

Global Human Development Program at Georgetown University

The Global Human Development Program of Georgetown University is home to one of the world's premier master's degree programs in international development. An innovative, academically rigorous skills-based graduate program, the Master of Global Human Development degree prepares the next generation of development professionals to work with public sector agencies, private businesses, and non-profit organizations that advance development. Through coursework, extracurricular activity, and practical fieldwork experiences, our graduates develop the insights, skills, and experiences necessary to become leaders in development and make a difference in our global community.

<https://ghd.georgetown.edu>

INTRODUCTION

Meet Oscar Contreras, founder of Fundación Ciencia Joven

Oscar Contreras' passion for science began while he was a high school student in Valparaíso, Chile. He was drawn to the creativity and innovation that science inspired, as well as the critical thinking skills required to test hypotheses and carry out experiments. As his enthusiasm for science took hold, Oscar observed most of his fellow classmates did not share his interest.

With relatively little guidance and few role models in the field to emulate, Oscar went on to pursue his love of science and studied Biochemistry in university. His studies proved to be personally transformative and, as he collaborated with likeminded scholars and developed his own skills, he came to understand the deeper importance of connecting other young people to the opportunity to pursue science across Chile.



Upon graduating from university, rather than seek employment in a lab or with a large company, Oscar returned to his high school, motivated to empower students to create better futures through science. In partnership with his high school teacher, Marjorie Parra, Oscar piloted the first national STEM (Science, Technology, Engineering and Math) camp for youth.

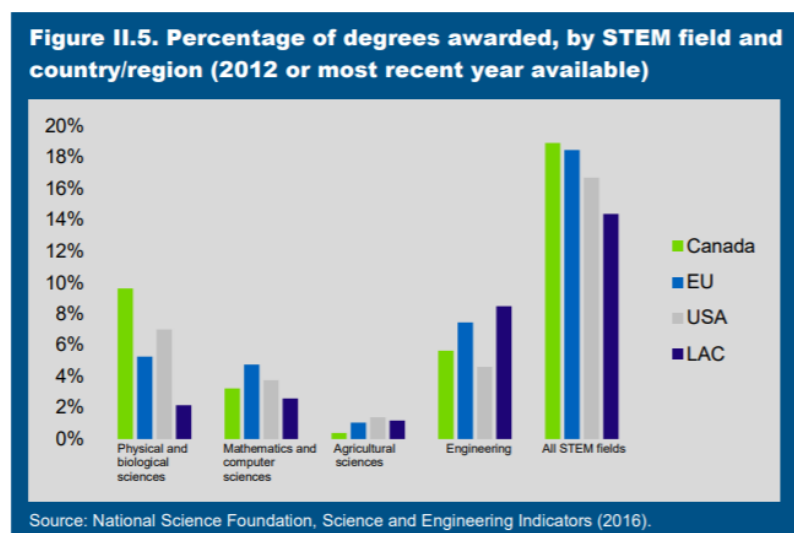
Following the camp's early success, Oscar saw potential to expand his reach. In 2011, he founded Fundación Ciencia Joven (FCJ), a nonprofit organization with a mission to inspire Chilean youth in science. Oscar returned to school to earn a Master's degree in Public Policy at the University of Chile/University of Chicago to gain the tools to effectively manage an organization that could achieve his mission. FCJ continued to evolve under Oscar's leadership. The camps grew into a regionally renowned program for its efforts to equip youth with leadership and STEM skills across Latin America. Through a partnership with Google, FCJ begun piloting STEM academies in high schools throughout the region.

Oscar held the position of Executive Director of FCJ from its inception in 2011 until 2016, when he made the decision to step down. During his tenure, FCJ grew from a small youth camp into a growing international organization with offices in two countries that serves over 400 students on a weekly basis in Chile, Argentina, and Uruguay. The organization has also developed strong partnerships with multi-national corporations such as Google, Bayer, and Boeing under Oscar's leadership. Oscar currently serves as the Chairman of the Board of Directors to continue offering his guidance and support.

Fundación Ciencia Joven is equipping youth and educators in Latin America with science and leadership skills to achieve a better future

The Problem

As countries like Chile emerge as hubs for science research, technology and entrepreneurship, their labor forces must reskill to perform in newly created jobs. As the Organization for Economic Cooperation and Development (OECD) states, there are “major challenges for LAC countries that are transitioning into knowledge-based economies where citizens need to innovate, adapt and leverage advanced human capital.”¹ As Oscar found in his own high school, limited STEM training in the region leads to a skills mismatch. In 2015, 42% of companies in Latin America reported having difficulties hiring people to fill the roles their companies required.² Companies throughout the region express difficulties finding employees with hard skills in STEM, as well as soft skills including problem solving, communication, and leadership. This is largely due to the fact that primary and secondary school education in the region is not preparing students adequately in these key skill areas. The OECD found that only half of Latin American students acquire basic proficiency in the core subjects of reading, math, and science. In addition, many students are not seeking STEM related tracks, as shown below:



A gap also exists in instructors’ abilities to teach STEM and leadership skills due to rigid curricula and a lack of resources and strategies to improve pedagogical practices. The World Bank found that the quality of teaching in these skills often translates to poor levels of student learning.³

Unlike in the United States, Canada, and Europe, there are few additional opportunities in Latin America to develop key skills in STEM and leadership competencies outside of the classroom. The lack of outlets to develop STEM and leadership skills outside of the classroom put Latin America at a disadvantage in preparing the next generation to reach its full potential.

¹ OECD, “Latin American Economic Outlook 2017: Youth, Skills and Entrepreneurship” https://www.oecd.org/dev/americas/Overview_LEO2017.pdf.

² Fiszbein, A., C. Cosentino, and B. Cumsille. “The Skills Development Challenge in Latin America: Diagnosing the Problems and Identifying Public Policy Solutions.” Washington, DC: Inter-American Dialogue and Mathematica Policy Research, 2016.

³ “Bruns, Barbara; Luque, Javier. 2015. Great Teachers: How to Raise Student Learning in Latin America and the Caribbean. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/20488> License: CC BY 3.0 IGO.”

The Solution

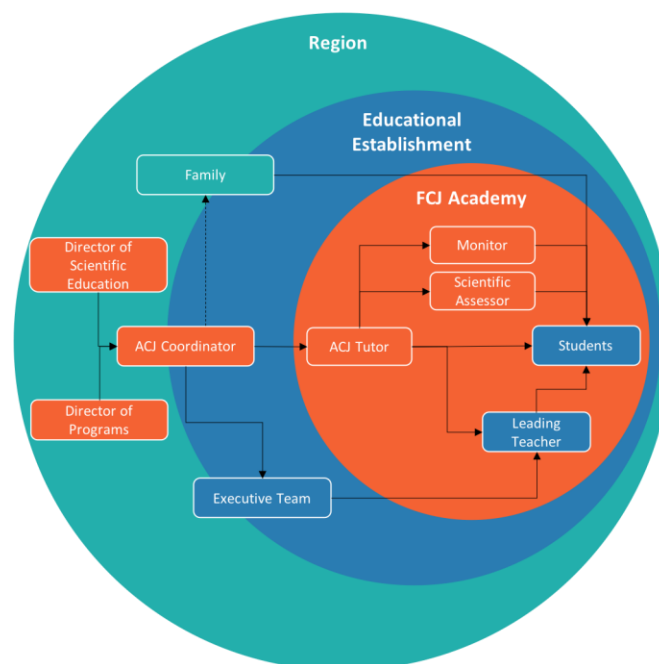
In response to the problems outlined above, FCJ has developed three interrelated programs to confront the weaknesses of STEM education and leadership training in Chile and the surrounding regions: STEM Leadership Camps, STEM Academies, and Science Awards.

The STEM Leadership Camps are ten-day camps providing leadership and STEM training for youth and STEM professional development for science teachers. The camps provide opportunities for students to enhance their knowledge and passion for STEM, while also building critical skills required in the workforce and in the classroom. The program, which has gained regional attention, involves a competitive selection process, and has a 4% acceptance rate. FCJ has also formed a robust alumni network of camp participants to further connect the science community throughout the region.

“For me personally it was very enriching, it allowed me to evaluate my own abilities as a leader, a scientist and a young person, I learned a lot from many people, all different and each one very special, and it has helped me a lot for the beginning of a new stage.”

STEM Leadership Camp Participant

The STEM Academies are after-school science programs that provide leadership and STEM training for youth. The academies are overseen by science teachers within the school as well as by a mentor from FCJ. FCJ has developed a curriculum to guide students through the methodology of creating a research project, and which culminates in a regional science fair. The power of the program lies in its ability to transcend the academy itself. Through outreach and engagement of school administrations, the goal is to promote pro-science mentalities and build communities that recognize the potential of STEM education. The framework below illustrates the network of STEM Academies.



Finally, FCJ implements a Science Awards program in partnership with UNESCO to recognize regional programs that are improving science education for both teachers and youth. Applicants to the awards are evaluated based on preset criteria within five distinct categories. While this program occurs less frequently and is secondary to the central programs of the academies and camps, it serves as an example of how FCJ is investing in the region’s STEM programming and in developing communities of youth interested in STEM.

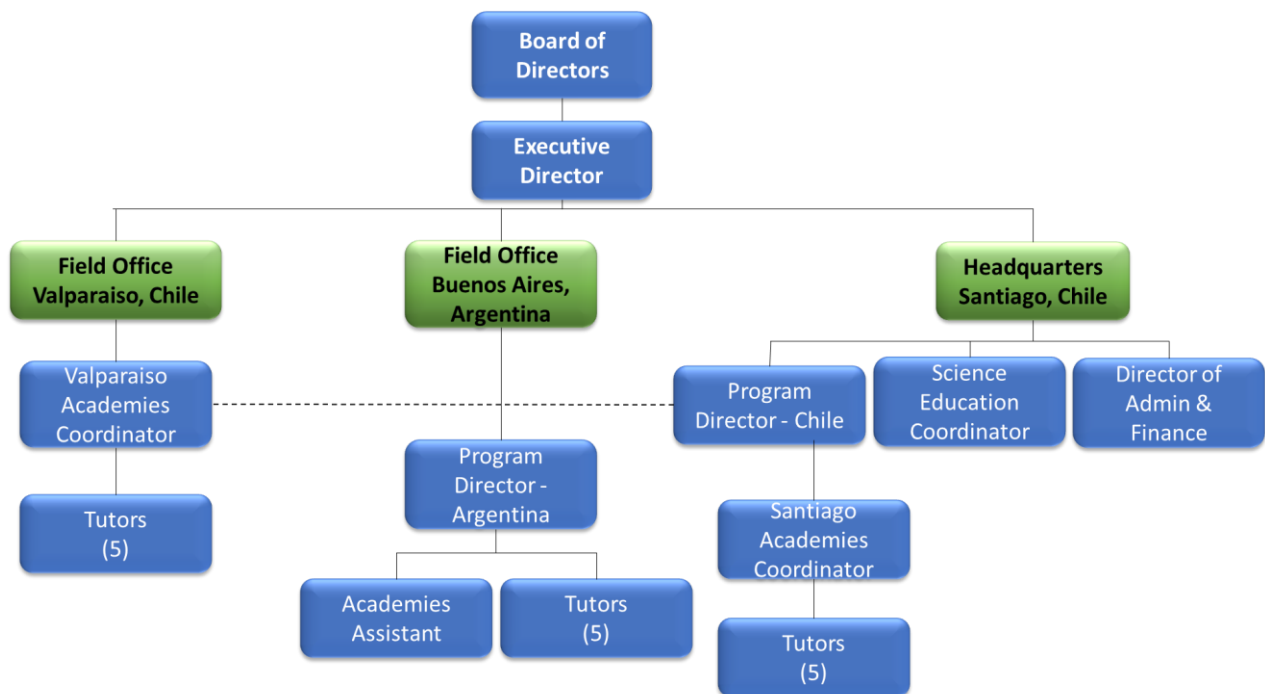
OPERATIONAL MODEL

Structure

Fundación Ciencia Joven is a registered nonprofit organization in Santiago, Chile. The organization has held this status since it was founded in 2011. While headquartered in Santiago, FCJ also maintains field offices in Valparaíso, Chile and Buenos Aires, Argentina. Each field office implements programming in their respective regions, with the exception of the Santiago office, which also oversees programs in Uruguay. The team consists of 26 paid staff members who are dispersed between the three offices.

Management is organized into three levels. The top level consists of the Executive Director and Board of Directors. The second level is comprised of the Director of Administration and Finance and the Program Directors for Chile and Argentina. The final level is the field staff which includes the science education coordinator, field academies coordinators, assistants, and tutors. The field staff provide hands-on assistance for the STEM Leadership Camps and the STEM Academy programs. FCJ relies on over 50 seasonal volunteers to staff the STEM Leadership Camps. Finally, FCJ works directly with the principals of each school, as well as the local Ministries of Education to obtain funding necessary to hire teachers to run the Academies.

Organizational Chart



FCJ describes itself as a stand-alone organization with large corporate partners. To date, FCJ's main sources of revenue are corporate sponsorships and donations, government grants, and in-kind donations. Bayer was the organization's first major donor. Other key partners include Google, which works with FCJ to administer science academies in target areas of the country, and UNESCO, which is the primary funder of the awards program, as well as The Boeing Company, Merck, the government of Chile, and the Pan American Development Foundation.

Accountability/Governance

The Board of Directors consists of seven members based in Chile, with Contreras serving as Chairman. As the founder, Contreras has the responsibility of selecting each board member. In addition to providing guidance in fundraising and partnership management, the board's main objectives are to select the Executive Director, approve the budget, and make any major changes to the organizations bylaws or high-level global strategies. All other decisions are made independently by the Executive Director and senior staff. FCJ prides itself on its flat, open organizational structure.

KEY ASSETS & SUCCESSFUL METHODOLOGIES

Fundación Ciencia Joven has developed an impressive set of assets that include unique and proven programmatic methodologies as well as a carefully curated network of stakeholders in the Latin American STEM education space. These assets serve both to enhance FCJ's competitive advantage as a leading advocate for STEM education and provide a foundation for the long-term sustainability of the organization.

Internationally Competitive STEM Leadership Camps

Principal among FCJ's core assets are its two STEM Leadership Camps, designed to train and prepare both students and teachers to be leaders in STEM fields. Bayer Kimlu is a ten-day camp for exceptional high school students who are interested in pursuing careers in the STEM field. With a focus on leadership training, the program attracts a diverse range of applicants from across the region. Bayer Kimlu is highly competitive, and each year draws several hundred applicants from throughout Chile, as well as neighboring Argentina and Uruguay. The forty students that are selected to participate represent some of the brightest and most promising young leaders in the STEM field in the region. FCJ also offers a week-long camp for high school STEM teachers called Kimkelen. Compared to Bayer Kimlu, Kimkelen is smaller in scope, and aims to serve teachers within Chile. It is not designed to be nearly as competitive and is positioned as a professional development and leadership training opportunity for STEM teachers.

Both of these STEM Leadership Camps represent the culmination of programmatic models that have been continually refined over the course of several iterations. Annual evaluations are used to assess both the impact as well as the operational efficacy of each model, and strategic revisions are made as necessary. Since FCJ's inception in 2011, the team has taken numerous steps to strengthen the model, including integrating digital tools into the marketing and recruitment phase, reducing program costs through creative partnerships, and developing an outcomes-oriented staffing plan. The FCJ core team leverages a network of university students to serve as seasonal staff to assist with camp logistics and has also developed a series of in-kind partnerships with camp facilities and service providers to reduce the operational costs of the program. FCJ's marketing strategy, which includes social media campaigns, email marketing, and word of mouth promotion, have proven highly effective at spreading awareness and driving higher application numbers.



In terms of social impact, the STEM Leadership Camps have consistently succeeded in increasing awareness about opportunities in the STEM field, as well as in strengthening leadership capacities among attendees. FCJ staff evaluate students who attend Bayer Kimlu across three dimensions: skills and competencies in scientific techniques, leadership qualities, and sector context and understanding. According to the most recent results gathered in 2017, participants displayed progress in each of these three dimensions upon completion of the camp.

Scalable Model for STEM Academies

FCJ's STEM Academies have proven to be a highly successful and scalable model that fills an unmet regional need for extracurricular opportunities in the STEM field. These academies operate out of high schools throughout Chile and Argentina, and promote long-term, community-level partnerships in support of STEM education. Trained FCJ staff work with high school teachers to implement a proven curriculum with participating students. The curriculum involves an innovative blend of training in leadership as well as in scientific research methods and encourages students to apply scientific principles to real-world issues in their communities. To date, FCJ has worked with over 1800 student participants in dozens of school systems across the three countries in which they operate.

“For me, the academy is a door that opens up science. It helps you decipher many things that maybe you did not understand - there are things that affect you and your environment, and you don't even realize it, but you can contribute in a small way and make a change.”

Valentina, 2017 STEM Academy Participant

FCJ has been particularly successful at developing strategic partnerships with multi-national corporations to support its STEM Academies. They have secured and managed multi-year contracts with corporate funders who have a stake in strengthening local STEM education. FCJ has also successfully managed relationships with municipal departments of education and has attracted in-kind resources to supplement direct funding. The program's model is replicable and scalable, as is evidenced by its regional growth to date, and represents a significant organizational asset.

FCJ assesses the impact of the STEM Academies as a function of student growth in two dimensions: leadership development and the quality of their final project. The final project requires students to choose and analyze a scientific problem, develop a hypothesis, conduct a series of experiments, and

interpret the results. According to the most recent evaluations conducted in 2017, student participants demonstrated competency and learning in both scientific theory as well as in the application of scientific methodologies. Participants also demonstrated growth in leadership qualities as reported by their teachers.

Alumni Network of Students and Teachers

Over the course of several years of programming, FCJ has built an extensive alumni network of teachers and students who are passionate about STEM. Hundreds of students have passed through the STEM Leadership Camps and hundreds more have participated in STEM Academies. As these numbers continue to grow, and as past participants begin to enter the workforce as STEM professionals, the value of this network will continue to increase. Not only do program alumni have the potential to be future partners, collaborators, and donors, but they will extend the marketing reach of FCJ, allowing it to continue to expand the visibility of its brand. Because a core component of its mission deals with raising awareness, and so much of its marketing is driven by word of mouth, FCJ’s growing alumni network has the potential to leverage significant impact.

FCJ recognizes the value of its alumni network and has taken strategic steps to cultivate its growth. FCJ’s alumni now have their own international association with formally selected representatives in each of the primary cities in which the programs operate: Santiago, Buenos Aires, Valparaíso, and Montevideo. Each year, FCJ hosts two two-day long conferences held in Santiago and Buenos Aires for alumni to attend workshops and lectures as well as to network and organize activities amongst themselves. FCJ offers seed funding to support alumni-founded projects and activities throughout the year.

Regional Leadership in the STEM Education Space

Fundación Ciencia Joven has succeeded in establishing itself as a regional leader in the STEM education space. The relationship capital it has built among funders and partners, as well as its track record of results have positioned it at as a leader in high school STEM education in Latin America and represents a tangible asset to the organization. FCJ is one of the first groups in Chile to progress past the phase of being a loose coalition of scientists interested in promoting STEM education, into being a fully staffed and fully autonomous nonprofit organization. Its position as “first to market,” as well as its early success with programming has opened doors to collaborations with major funders.

FCJ has also developed significant relationships at various levels of government, working with local departments of education to support program delivery as well as the regional growth of STEM education. This track record of successful public-private partnerships has served to increase the stature and reputation of FCJ, as well as inform future efforts to engage the public sector.

	Alumni Network	<ul style="list-style-type: none"> • A Regional network of teachers and students who have participated in programming.
	STEM Academies	<ul style="list-style-type: none"> • Extracurricular academies training high school student in leadership and scientific inquiry
	STEM Camps	<ul style="list-style-type: none"> • Competiative STEM leadership camps for teachers and top high school students interested in STEM careers

CONCLUSION

Fundación Ciencia Joven has succeeded in developing and executing a business model that is not only socially impactful, but that is also capable of replication at scale. FCJ has developed several programmatic models to promote leadership in STEM fields that have been deployed successfully in several contexts and sets of conditions, validating the replicability of its curriculum and programs. At their current capacity, STEM Leadership Camps attract thousands of applicants from around Latin America and serve hundreds of students on a yearly basis. In addition to program participants, FCJ has succeeded in building effective partnerships with the Chilean government, as well as multinational corporations including Bayer, Google, Samsung, Boeing and the Pan American Development Foundation. As FCJ's alumni network continues to expand, and as its reputation as a thought leader in the STEM education space continues to grow, the value of FCJ's assets will continue to appreciate. Within this context, FCJ has positioned itself for long-term sustainability and with a clear opportunity to scale regionally.

FURTHER INFORMATION ABOUT FUNDACIÓN CIENCIA JOVEN

- [Fundación Ciencia Joven Website](#)
- [Fundación Ciencia Joven Facebook Page](#)
- Twitter [@fcienciajoven](#)
- [Fundación Ciencia Joven LinkedIn Page](#)
- [Fundación Ciencia Joven Youtube Channel](#)
- [YouthActionNet Fellow Profile of Oscar Contreras' YouthActionNet Profile](#)
- Blog: [Escolares Aun Pueden Postular a Campamento que Busca a los Cientificos del Futuro](#)
- Video: [Working with Companies to Pursue Shared Values](#) with Fellow Oscar Contreras
- Video: [Promoting Science Education in Chile](#) with Fellow Oscar Contreras

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