

# A CUSTOMER SUCCESS STORY

## Bringing Robotic Studies to Paraguay with CoderZ



TECH LEARNING ▶ CREATIVE THINKING ▶ CAREER SKILLS

# CoderZ Brings Robotics to Paraguay for the First Time

A Case Study in Transformational Education Solutions for Students and Instructors



Intelitek are taking the integral skills of coding and STEM education to the 99% of students who have never had a chance to work with robotics. Focusing on a core team of teachers in Paraguay, all of whom had no previous experience in technology, in a country which is looking to grow their strengths in education for economic success, we successfully launched our CoderZ program, measuring the potential of the educators on the ground.

We created and implemented a program which trained the instructors in Robotics, Coding, and STEM education, and included mentor-led, on the job training with real-world classroom application.

We included soft skills, and tools to ensure that the subsequent education was accessible to higher education students from all socio-economic backgrounds. It has now become a self-sustaining model for the skills vitally needed for the labor force.

A cloud-based system, accessible from home or school, over 1000 students learned the CoderZ syllabus in the first year, which continues to function in Paraguay due to our program. It breaks down the myth that STEM education has an impossible barrier to entry, presenting a fun and exciting gamified curriculum to get students ready to become the workforce of tomorrow.

## THE BACKGROUND OF STEM EDUCATION

STEM (Science, Technology, Engineering and Mathematics) projects have changed the way that education functions around the globe, having a direct impact not just on the labor force, but also on economic growth and employability itself. These areas are linked to higher earning capacity, technological advances, and the ability to really make a contribution to the welfare of the respective countries.

STEM has the ability to change the world, with the countries that have been putting significant resources and effort into K-12 STEM education over the past decade already reaping the rewards. Nations like China and India, who have prioritized STEM curriculum changes and incentives have

risen in the ranks of the largest economies in the world, competing with the likes of the United States and Japan<sup>12</sup>. They can now compete with the rapid change that is our technological and industrial reality. Technological skills are increasingly important across every industry, not just in Computing, but in Finance, Textiles, Agriculture and more.

In particular, Robotics has caught the attention of many educational institutions around the globe. It is an exciting and attractive field of study, and has widespread application across many industries, both existing and emergent. It also broadens opportunities for professional development, making the study perfect for any economy interested in social mobility and diversity.

### CHALLENGE

The Educational system in Paraguay needed a complete overhaul. STEM education was essential for career readiness, but costs and instructor capabilities made it impossible to compete, making Paraguayan graduates ill-equipped for the technological workforce.

### SOLUTION

Intelitek uncovered the potential of 20 instructors, and spent a year focusing on STEM and Robotics with them, in and out the classroom. Now trained to hand over this knowledge, they have also created a self-sustaining model for the future of education in Paraguay.

### BENEFITS

- STEM education is affordable and accessible
- Educators become mentors for their students
- CoderZ lowers the barrier for entry to robotics
- Graduates become career-ready for the workforce



1 <https://www.aip.org/fyi/2018/rapid-rise-china%E2%80%99s-stem-workforce-charted-national-science-board-report>

2 <https://www.investopedia.com/articles/investing/022415/worlds-top-10-economies.asp>

## WHY PARAGUAY?

- In 2013, the World Economic Forum ranked Paraguay 138 out of the 144 countries studied in terms of its educational system.
- Paraguayan educators need to make a change in the way that they teach, to narrow the education gaps, and to promote effective work performance in a global economy.
- According to the 2017 Shadow Report, there is a diversity problem in STEM education between the genders. Women's access to university programs in science and technology (STEM) continue to be low

## THE CHALLENGE

- The number of people who can access this field of study is impacted by socio-economic factors, both at university level and in the workforce
- The results of any intervention in Paraguay have to be able to reach men and women alike. "Equality is not a question, it's an essential part of the answer."
- Pace of change. The skills and knowledge needed to succeed in the labor force may change beyond recognition in the next 10-15 years.
- Robotics programs are difficult to launch on a large scale due to educational budgets. Most students would never have the opportunity to work with Robots.
- The teachers had no background in technology whatsoever, and would need to be immersed in STEM study and coding every day of the program.

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"The most important thing for me is that CoderZ is a learning environment that anybody can learn how to use. Not only those who have learned how to code or program in the past"



- Néstor Leguizamón Program Participant & Instructor

## SINAFOCAL

As the National System of Training and Labor Training, SINAFOCAL have a clear aim, to close the gap which currently exists between the labor market and the educational system. They work under the Ministry of Labor in Paraguay. SINAFOCAL's core goal in this project was to train the teachers to better serve their graduates, so that they are prepared to enter the work force.

## CODERZ™ BY INTELITEK

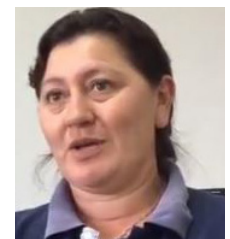
Intelitek offers sustainable solutions to empower both students and teachers with career and technology education. They have changed the face of education around the world, with expertise in transforming human capital, and the creation of customized and innovative programs in STEM education.

CoderZ by Intelitek functions without the need for any prior knowledge of computer science or programming. It is a project-based curriculum which excites students due to the use of gamification and robotics, but embeds the underlying concepts of Physics, Math, Design and Engineering. The content encourages students to practice and embrace teamwork, creative problem solving, and leadership skills, all within a non-traditional teaching framework which pushes the boundaries of education in the region.

The CoderZ program also looks to create career-readiness, allowing students to follow whatever path they choose with better hard and soft skills than before. The program promotes discovery, curiosity, creativity, and experimentation, opening up doors for academic excellence. The classroom is led by better instructors, who in turn can raise the level of competence and knowledge for the students. Technology can support mentor/mentee relationships online, helping communication and learning progress even for long-distance learning.

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"We can apply what we learn in class and give real examples to it in numerous areas. Everything, while incorporating robotics into our education curriculum"

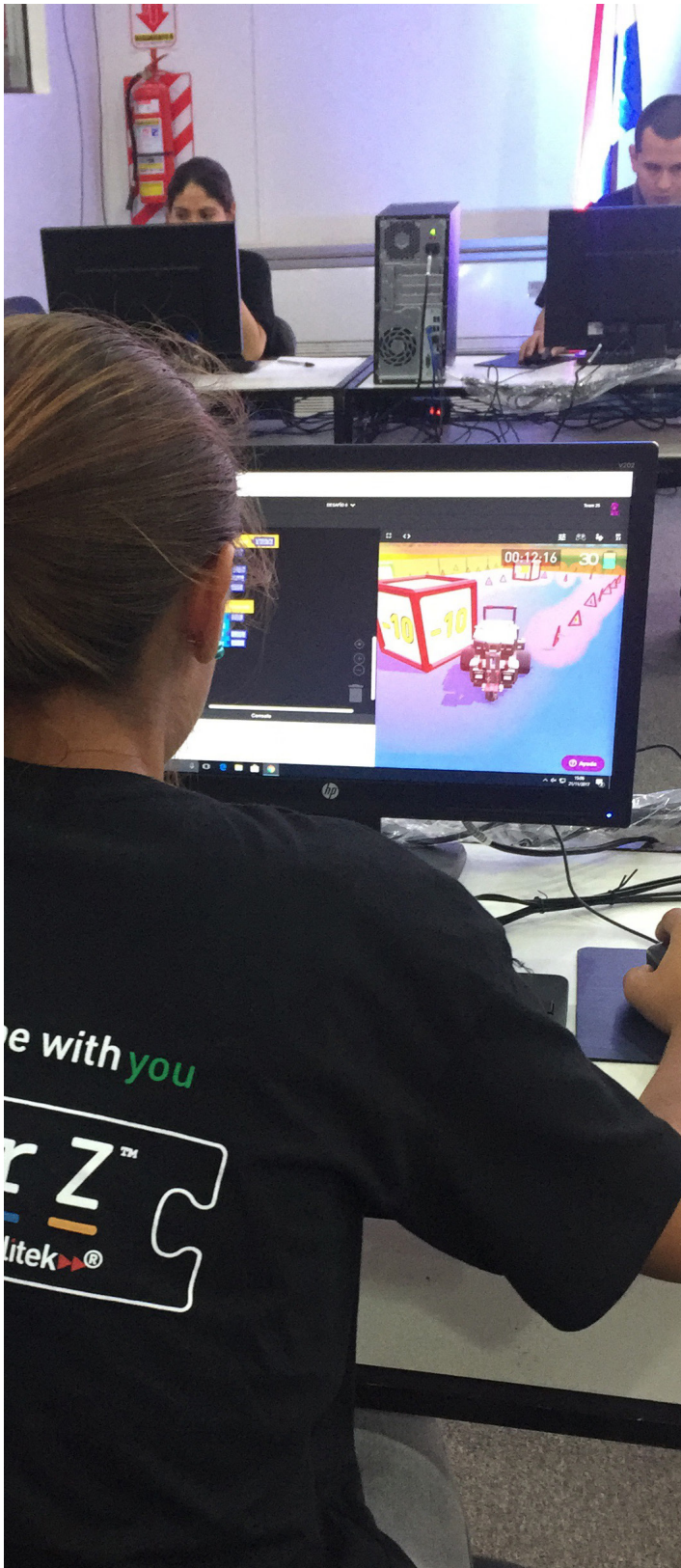


- Mirtha Insfrán Program Participant & Instructor



### WHAT MAKES CODERZ UNIQUE?

- The program is online and cloud-based, which means anyone can access it from either home or school. It is immediate and everywhere, on any web browser.
- There is no prior knowledge needed. Students can start from scratch to learn coding and robotics. The program enables auto-deductive learning.
- It is a fun and addictive solution, with gamification for competition and social engagement. Encourages students to compete with their friends and try to win.
- Self-paced learning is customized to take each person through the process step by step.
- It includes everything that teachers need, including all lesson plans. Teachers function as mentors and guides, rather than needing all the knowledge ahead of time.
- Each student receives a virtual robot. They can code in simulation, receiving immediate feedback and keeping costs to a minimum.
- Traditional Robotics are accessible to only 1% of students, while CoderZ creates a reality where it can reach the other 99%.
- It includes multiple platforms, with varied styles of learning from tutorials to XR simulated environments.
- We include support for classroom management, as well as an in-depth knowledge center.
- We focus on the need for a low investment, yet with deployment suitable for large scale.



## **CODERZ™ STEM EDUCATION PROGRAM - ROBOTICS CODING STUDY PLAN**

The STEM Education Program allows training centers around the world to implement coding classes to wide audiences, including allowing for diversity in gender and socio-economic background. This levels the playing field for coding and robotics instantaneously, allowing schools and educational programs to offer technological development without large investment or time commitment.

Students will learn how to code virtual or real robots using gamification and problem solving. Beginners will use Blockly code, while those with more experience can use Java code. The educational platform is complete, and includes the entire curriculum and lessons, as well as instructional videos and support.

The course curriculum is 15 learning units which are 4 hours each. The units include training, background, worksheets, evaluation tools, core content and student activity Missions and Challenges.

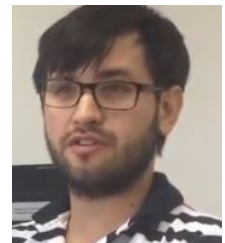
The curricula for Robotics includes:

- Subsystems of Robotics
- Navigation
- Basic Logic
- Data Manipulation
- Sensors
- Advanced Logic

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*“As instructors CoderZ helps us manage our classes more effectively because everything we need is in the platform.”*

*- Pedro Ramirez Program Participant & Instructor*





### CYBER-ROBOTICS CODING COMPETITION


In addition to this, and to increase incentives for students, Intelitek supported a week-long coder competition, with prizes for the best innovations with the use of Robotics and STEM technology.

This six-nine week innovative and exciting contest allowed students to compete in the field of Robotics, using gamified missions to progress through levels against one another, with no need for prior knowledge of coding or programming. The

contest could be done around school hours, and showed tangibly how STEM education did not have to include a high barrier to entry.

The trainers could assess the students based on their overall proficiency, as well as time on task and skills improvements, and as well as coding allows the students to learn Computational Thinking, Self-Directed Learning, Creative Problem Solving, Teamwork and Digital Literacy.

## ADDED VALUE: THE IMPACT OF THE PROGRAM

- The major focus of the project was that everyone can learn to code. One of the most unique elements of CoderZ is the cloud-based system, which allows the service to be delivered to the masses seamlessly, without installation and on a large scale. All training is included and can be sent online, and any support can be provided remotely, thanks to the knowledgebase and service portal.
  - The age range which this project can be beneficial to is extremely wide, from the age of 15 all the way to university level. This makes the program widely transferable and applicable to all.
  - The focus on Coding for Girls encourages the educational system to close the gender gap in these all-important industries, and open doors for diversity in the careers of tomorrow.
  - The project is a fully turn-key style approach, so can be used in other countries who want to improve their STEM capabilities for economic growth.
  - The ability to judge based on potential for learning and growth.
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- This means that the educators have the skills to pass on their training to the next generation, in the form of a sustainable model for STEM education. It's clear that Intelitek and CoderZ have passed on the most important tool of all to revolutionize the human capital in Paraguay, self-reliance.

## ABOUT INTELITEK

Intelitek is a world-leading developer, producer and supplier of technology training solutions. For over two decades, Intelitek have transformed educational process across the globe through our comprehensive technology learning solutions.

Over the past 35 years, our innovative and award winning educational initiatives have helped students from high schools to post-secondary institutions gain crucial skills that will ensure their future employability. Our programs have been taught in in over 50 countries, educating students in over 26,000 schools, labs and institutes, and teaching over 500 different training topics. We understand the changing needs of technology classrooms better than anyone in the world and can design flexible solutions that meet those needs within the framework of any budget.

Contact Us:



35-3000-0004 CS CoderZ A CoderZ Sinafocal Case Study

Toll Free: 800-221-2763  
Phone: 603-625-8600  
Fax: 603-625-2137

Email: [info@intelitek.com](mailto:info@intelitek.com)  
[www.intelitek.com](http://www.intelitek.com)