

DECEMBER 2019

STUDENTS OF GRANADA

DIGITAL LITERACY & ROBOTICS PROGRAM



PROGRAM REPORT 2019

A special thanks to:

Jack Cooley and Ana Agón of The Community Bots, John Richardson of St. Joseph Academy, the International Foundation, Directora Milena Zeledon and Luis Carlos Rios Vallecillo. It is their vision, leadership, and support that fueled the flames and made these incredible ground-breaking projects a reality for so many students and families at Escuela Carlos Bravo.

A shout out to Dr. Yakir Arteaga of New York University Dental College Global Outreach for making the initial introductions. Eternal gratitude to Director Luis Mendoza of MINREX, Valerie Mendieta of MINED, Director Ernesto Torres of DGA, and Ernesto Varela and Elizabeth Chavez of Comtech for their ongoing support.

THE OBJECTIVE OF OUR COMPUTER LITERACY AND ROBOTICS PROGRAMS IS TO PROVIDE OPPORTUNITIES FOR STUDENTS AND TEACHERS TO LEARN AND APPLY TECHNOLOGY SKILLS THAT ARE FUNDAMENTAL TO THEIR FUTURE ACADEMIC AND PROFESSIONAL SUCCESS.



One of the 3 teams from Carlos Bravo won 2nd place in their age category at the Nicaraguan National LEGO Olympiad one month after completing their initial LEGO training. One of the few public schools participating, they competed against well-resourced private schools who had been working with NXT and EV3 robots for more one year.

In 2019, we successfully launched Digital Literacy and LEGO Robotics programs at Escuela Carlos Bravo – an incredible accomplishment by educators, students, and parents in the midst of a challenging political and economic period in the country.

Students of Granada and the Director of Escuela Carlos Bravo, Milena Zeledón, had long envisioned a technology program at her school. Carlos Bravo serves almost 1,000 students from many of the poorest families of Granada. When we were offered the opportunity to work with CommunityBots of New York City to implement an extra-curricular LEGO robotics program for 4th and 5th graders, we were determined to make it happen. Despite the crisis of 2018, the Carlos Bravo community has exceeded all expectations:

- 40 students completed a 170 hour digital literacy course.
- 7 educators and 37 students completed 34 hours of LEGO Mindstorm NXT robotics training
- 21 teachers completed 24 hours of computer literacy training
- 3 teams participated in the LEGO National Olympiad - one bringing home 2nd place in their bracket
- Digital Literacy and Robotics classes are now ongoing - enriching the STEAM skills and experiences of the Carlos Bravo community. We are honored to offer one of the few comprehensive STEM programs in a Nicaraguan public primary school.

A PERSISTENT, FOCUSED AND COLLABORATIVE EFFORT...

In February 2018, Students of Granada entered into a partnership with CommunityBots whose mission is to provide training in STEM-robotics to middle school girls in under-served communities in New York City and around the world.

Jack Cooley of The Community Bots donated 14 LEGO Mindstorm NXT Robotics kits and committed to 68 hours of student and teacher training that included a full video and print course developed in Spanish. The program was scheduled for August 2018.

Jack facilitated a donation of refurbished laptops from their long-time partner, John Richardson of St. Joseph Academy of Baton Rouge, Louisiana. John committed to a donation of 35 refurbished laptops and a technical support team and equipment to set up a computer lab in advance of the LEGO training.

While The Community Bots usually works with St. Joseph to provide computers for their LEGO programs, we knew that students and even most teachers had no experience using computers and software. We wanted to provide a strong foundation for the LEGO program as well as invest in developing critical digital literacy skills.

A program proposal was submitted to the Dept. of Education (MINED) in March 2018 that incorporated a MINED-developed digital literacy curriculum, LEGO robotics, and strategies to ensure parental engagement and support.

Despite the unfolding crisis, MINED approved the project in early May 2018. However, the subsequent travel alert (#4) made it impossible for our partners to travel to Nicaragua or to bring the equipment.

We moved to Plan B - personally transporting small groups of equipment by suitcase. By December 2018 we had enough equipment in place to begin the digital literacy pilot during school vacation in January 2019.



...TAKES A PILOT TO A PERMANENT PROGRAM

We made some adjustments to curriculum and student selection based on learnings from the pilot and added a 2nd digital literacy program in advance of the robotics training. Teachers at the school began to ask for training, so we added a 2 hour class for them twice a week.

While the St. Joseph's student team was unable to travel due to the travel alert (#3), Jack Cooley did not face the same restrictions, so we were able to proceed with LEGO training in July 2019. MINED supported the program and sent 2 technology educators to the LEGO training.

Our LEGO teams completed training at the beginning of August and went on to compete and place in the National Olympiad in Sept. 2019. Today, we continue to offer 2 computer literacy programs before school as well as a robotics club that meets twice a week.

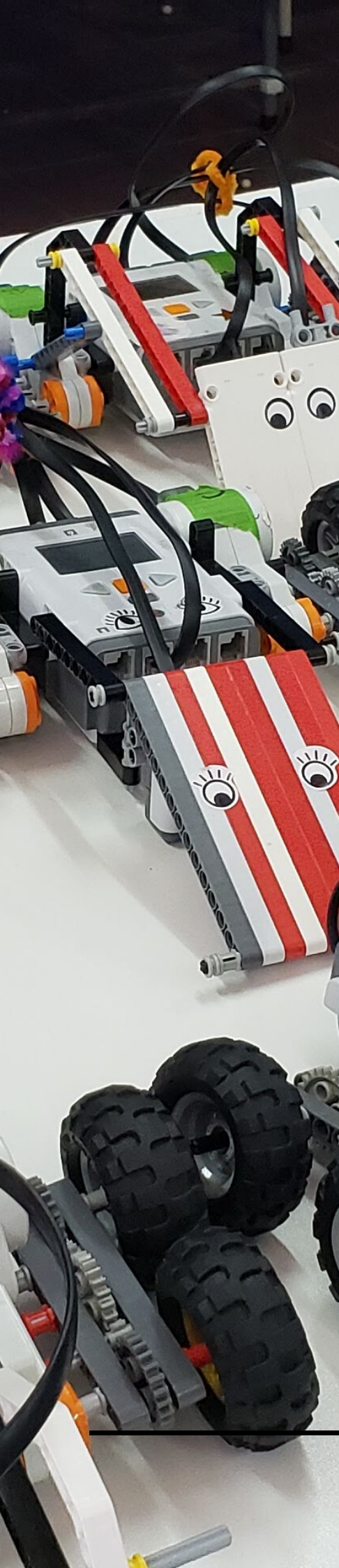
As the program unfolded, we were fortunate to partner with several other organizations: International Foundation (US) provided a grant to help support programming. Comtech SA of Nicaragua donated a LEGO competition table, technical support, and covered entrance fees to the National Olympiad. NicaPhoto in Nagorate, Nicaragua provided a LEGO instructor through their partnership with The Community Bots.





PROJECT TIMELINE

PHASE	START DATE	END DATE
01: PLANNING PLANNING, DEPT. OF ED APPROVAL, IDENTIFY INSTRUCTOR	JAN 2018	MAY 2018
02: EQUIPMENT PLAN B SUITCASE TRANSPORT	MAY 2018	MAY 2019
03: DIGITAL LITERACY PILOT PARENT OUTREACH, STUDENT REGISTRATION, CURRICULUM ADAPTATION, PILOT 1 CLASS	NOV. 2018	FEB. 2019
04: DIGITAL LITERACY ROLL OUT EXPAND CLASS ENROLLMENT. ADJUST PROGRAM DURATION FOR MORE COMPREHENSIVE CURRICULUM (170 HOUR) TEACHERS REQUEST 24 HR TRAINING PROGRAM	FEB. 2019	JULY 2019
05: LEGO ROBOTICS: THE COMMUNITY BOTS 34 HOURS TRAIN THE TEACHERS 34 HOURS TEACHERS/STUDENTS TRAIN STUDENTS TAKE 2ND IN BRACKET IN NATIONAL LEGO OLYMPIAD	JULY 2019	SEPT. 2019
06: PERMANENT PROGRAMMING DIGITAL LITERACY PROGRAM CONTINUES FOR STUDENTS AND TEACHERS. ROBOTICS CLUB MEETS WEEKLY. PROGRESS TO EV3 AND EXPAND PROGRAM TO MORE STUDENTS AND SCHOOLS.	SEPT. 2019 - DEC. 2019	2020-2021 SCHOOL YEAR



PROGRAM DESIGN

Few students had ever used a computer or tablet. Some had access to family's smartphones. None of our students had experience with LEGO or other robotics programs. All students and parents had to sign a commitment letter to participate.

Digital Literacy Course:

- Grades 4, 5, 6; 65% girls.
- 15 - 20 students per group - 1 student per laptop.
- Meet daily before school for 2-3 hours
- Students must be in good academic standing - and be near or at grade level in math and reading.
- 170 hour course covers file and folder management, typing and computer basics, image management, Paint, Microsoft Office (Word, Excel and PowerPoint), search and internet best practices, Intro to Robotics.
- Course was built on an adaptation of MINED ABCs of Computacion and updated for current operating systems and software.
- Students were graded on each unit and were given interim assignments and quizzes to assess understanding and application. Attendance was included in the final assessment.
- The instructor, Luis Carlos Rios, is attending MINED's professional development program focusing on technology & pedagogy.

LEGO Mindstorm Robotics:

- Grades 4, 5, 6 ; 70% girls
- Students had to have completed Digital Literacy program - or at least though the Excel & Word Units.
- Teachers train on the same curriculum as students in advance for 34 hours (8 am-4 pm for 6 days). Students work with teachers an additional 34 hours over 6 days. CommunityBots leads both training sessions.
- Curriculum is video-based, and in Spanish. Activities enable teachers to guide students as they solve problems that help them master the equipment and coding concepts.
- Teams of 2 for each robot unit (in some cases 3)
- Visits by women working in STEM or in business
- Luis and robotic coach, Nestor Morales meet virtually with a master LEGO instructor from The Community Bots once a quarter to set goals and discuss progress and challenges.
- Robotics club meets 2 days a week for 3 hours each day

Each program held a graduation ceremony with parents in attendance. All students received a certificate. The top three students or challenge winners received a small cash recognition..



BUDGET BREAKDOWN


CATEGORY	COST
EQUIPMENT	
<ul style="list-style-type: none"> • THE COMMUNITY BOTS: LEGO MINDSTORM NXT ROBOTICS KITS • ST. JOSEPHS: FUJITSU LAPTOPS • COMTECH: LEGO COMPETITION TABLE • TECHSOUP: SOFTWARE LICENSES (OFFICE, WINDOWS) & SUPPORT • COMPUTER SET UP & SPANISH CONVERSION • LEGO STORAGE, WORKTABLES • PROJECTOR (AUDITORIUM) 	\$ 25,011
INSTRUCTION	
<ul style="list-style-type: none"> • COMPUTER LITERACY & ROBOTICS • CURRICULUM DEVELOPMENT • STIPENDS ROBOTICS TRAINING 	\$ 3,385
TRAINING COSTS	
<ul style="list-style-type: none"> • THE COMMUNITY BOTS: 14 DAYS TRAINING LODGING, MEALS, AIRFARE • MEALS AND SNACKS 42 TEACHERS & STUDENTS 	\$ 11,753
OLYMPIAD	
<ul style="list-style-type: none"> • ROBOTS COACHING • TRANSPORTATION TO OLYMPIAD • MEALS AND SNACKS • REGOGNITION POOL PARTY 	\$ 634
VITAL SUPPORT	
<ul style="list-style-type: none"> • INTERNET SERVICE • COPIES OF CURRICULUM • AWARDS AND CERTIFICATES • TRAVEL AND LUGGAGE FEES.CUSTOMS TRIPS 	\$ 7,607
GRAND TOTAL	\$ 48,390

IMPACT: DIGITAL LITERACY

CENTRO ESCOLAR CARLOS A. BRAVO									
CECAB									
Calificaciones de la Clase de Computación. Programas vistos en clase.									
Nombre del Alumn@	Nota de Mecanografía	Nota de Word	Nota de Excel	Nota de Power Point	Nota de Internet	Nota			
...	92,8	98	92,5	93	94	94	1er lugar		
...	90,3	97	85,4	90	87,5	90	2do lugar		
...	86,5	88	84	85	89,5	87	4to lugar		
...	70,3	71	65,8	88	78,5	75			
...	75,3	74	64,4	72	78	73			
...	90,8	91	81	93	90,8	89	3er lugar		
...	73	73	81,3	70	71	74			
...	62,5	63	72	62	67,8	65			
...	90	69	82,8	61	85,5	78			
...	82	67	79,1	71	77,5	75			
...	73	70	67,7	60	76,8	70			
...	91,5	69	72,8	65	92,5	78			
...	72,5	71	70,6	65	74,8	71			
...	86,3	74	68,7	71	84,8	77			
...	95	83	96,5	61	94,5	84	5to lugar		
...	83,8	84	78	62	78	77			

CENTRO ESCOLAR CARLOS A. BRAVO

CECAB



Calificaciones de la Clase de Computación.

Semana #1				Semana #2				Semana #3				Semana #4				
Examen Escrito	Examen Práctico	Nota		Examen Escrito	Examen Práctico	Nota		Examen Escrito	Examen Práctico	Nota		Examen Escrito	Examen Práctico	Nota	Nota Final	
85	90	88	80	100	90	85	100	93	100	100	100	100	93	93	2do lugar	
88	90	89	70	90	80	80	80	80	85	100	93	85	85	85	3er lugar	
75	78	77	75	75	75	80	80	100	90	85	100	93	84	84	4to lugar	
80	65	73	65	60	63	68	63	66	65	60	63	66	66	66		
65	70	68	70	80	75	60	75	68	65	30	48	64	64	64		
70	78	74	85	85	85	70	80	75	85	95	90	81	81	81		
80	90	85	80	90	85	75	85	80	70	80	75	81	81	81		
65	70	68	78	70	74	65	75	70	75	78	77	72	72	72		
96	100	98	45	92	69	65	90	78	85	90	88	83	83	83	5to lugar	
70	85	78	80	100	90	70	80	75	68	80	74	79	79	79		
65	70	68	50	79	65	60	60	60	78	80	79	68	68	68		
80	80	80	85	75	80	78	85	82	70	30	50	73	73	73		
70	80	75	65	70	68	75	80	78	65	60	63	71	71	71		
90	60	75	80	50	65	65	70	68	70	65	68	69	69	69		
100	100	100	85	100	93	85	100	93	100	100	100	96	96	96	1er lugar	
70	76	73	76	80	78	65	80	73	89	90	90	78	78	78		

The Digital Literacy program at Carlos Bravo is serious business.

- Extra-curricular classes of this duration and intensity are unusual in Nicaraguan public schools and require a commitment from both parents and students.
- Students and parents are required to sign a commitment letter at the start of the program.
- Students are assessed weekly to ensure they understand and can apply skills and concepts.
- The instructor, Luis Carlos Rios, spends additional time with students if they have challenges with the curriculum.
- Students are acknowledged at a graduation ceremony. Attendance is included in the performance measure.

Students

- 30 students have completed the 170 hour course and 10 will complete 1Q 2020
- 90% of students that started the program completed it.
- 65% of students are girls.
- 87% received a final grade of 70 or above. 30% received a grade of 80 and above.
- The course is now a regular offering at the school and continues through school vacations for those interested,

Teachers

- 21 teachers have completed a 24 hour course held prior to school.
- Teachers were graded and report was forwarded to MINED
- Classes continue as requested.

"The purpose of this objective is to promote access and mastery of technologies as tools to encourage educational innovation, creativity and scientific curiosity, through the equipment of technology classrooms, connectivity and the use of educational software and the training and motivation of students and teachers. It is recognized that in general new generations are already immersed in the world of information and communication technologies but that their use for learning and knowledge building depends on proper use." MINED Strategic Plan 2017-2021

IMPACT:LEGO ROBOTICS



The Community Bots Builds Generations of Robotics Teachers and Students

- The Community Bots model is designed to train teachers to lead robotics programs by leading them through the teaching process with students.
- Teachers are required to submit trimester goals and meet with The Community Bots master teachers to review progress and challenges. This approach helps build a rigorous program that is structured to support sustained and progressive programming.
- Girls are inspired to consider STEM academic and career paths by women in the community who are invited to tell their stories.
- Students learned to work in teams to create and solve problems.
- Students and parents were given opportunities to visit Managua - many for the first time - and meet students from other schools around the country.

Students

- 37 students have completed the 34 hour course
- 100% of students that started the program completed it.
- 70% of students are girls.
- The program is now a regular offering at the school and continues through school vacations for those interested,
- 3 teams represented the school at the National Olympiad, and one team placed 2nd in their bracket after only 1 month of practice and using an older generation of equipment.

Teachers

- 7 teachers and MINED Technology Instructors completed 34 hours of training and instructed students in the subsequent 34 hours.
- Luis Carlos Rios Vallecillo and Nestor Morales are currently learning to use the upgrade to EV3 -in preparation to launch with the club.

THE TEAM

THE AWESOME PEOPLE BEHIND THIS PROJECT



MILENA ZELEDON
DIRECTOR ESCUELA
CARLOS BRAVO



LUIS CARLOS RÍOS
COMPUTER & ROBOTICS
INSTRUCTOR



NESTOR MORALES
ROBOTICS COACH



JACK COOLEY
CO-FOUNDER
THE COMMUNITY BOTS



ANA AGÓN
CO-FOUNDER
THE COMMUNITY BOTS



KAREN OROZCO
ROBOTICS INSTRUCTOR
NICAPHOTO



KATHLEEN DAVIS
STUDENTS OF GRANADA



HECTOR PÉREZ
STUDENTS OF GRANADA



JOHN RICHARDSON
ST. JOSEPH ACADEMY



ELIZABETH CHAVEZ
COMTECH



ERNESTO VARELA
COMTECH



PUPPY
OUR MASCOT

THE 2020 VISION



MORE OPPORTUNITIES:

The school and MINED are committed to continuing both the digital literacy and robotics programming with the support of Students of Granada. With additional laptop donations and hiring of another instructor, we can increase the number of students participating in the new school year.

LEGO EV3: We are in discussion with The Community Bots to provide equipment and training program for an EV3 upgrade in the summer of 2020. The Community Bots would also like to expand to a 2nd school in the area.

TECHNOLOGY CENTER:

MINED has been extremely supportive of our projects in 2019. Several teachers and tech staff from other MINED schools and tech center participated in the LEGO training and MINED has been receiving reports about the ongoing teacher and student training.

We are in the planning phases of building out a tech center at Carlos Bravo - a nucleus school - that would provide city teachers and students access to technology and instruction. This is critical to integrating tech into the classroom and enabling students to use and apply technology on a regular basis.

- **ADD MORE CLASSES TO INCREASE THE NUMBER OF STUDENTS PARTICIPATING AT CARLOS BRAVO**
- **UPGRADE TO LEGO EV3**
- **EXPAND PROGRAMMING TO A 2ND SCHOOL**
- **BEGIN PLANNING FOR A TECH CENTER THAT ENABLES CLASSROOM INTEGRATION AND EXTRACURRICULAR ACCESS TO TECHNOLOGY AND INSTRUCTION**



Top: Robotics Club students' final competition for the year.



Middle: Photo op with the judges at the National LEGO Olympiad in Managua



Bottom: Proud parents attend the graduation ceremony at the end of a long week of LEGO training.