



**LEAP Academy University Charter School**  
Camden, New Jersey

# 2015-2016 Annual Report

## LEAP Academy Fabrication Laboratory



# MESSAGE FROM THE FACULTY DIRECTOR



We aim to move STEAM education from learning of the facts to understanding and training the minds to think, to solve, to connect, to imagine, to develop, to manufacture and to change life and the life of the community. It is a very exciting time to be involved in STEAM at LEAP Academy University Charter School. The attention paid to science, technology, engineering, art and mathematics by the school administration, teachers, students and parents has certainly created an impact on our local community. We moved from a small fabrication laboratory to an area of more than 2,000 square feet, which includes a design, assembly, and manufacturing room, and our new Leap Innovation Store, located at the Dr. Gloria Bonilla Santiago STEAM Building. In addition, we have created two micro fabrication laboratories dedicated to robotics and to expose middle school students to fabrication and technology. Currently, we are working to create our lower school micro fab. lab. which will expose K-3 students to areas of computer science, chemistry, fabrication and business. We are expecting these young minds to generate a recycling crayon program for the

school, a potential business to resell the crayons to the community. Our initiatives, such as the Fabrication Laboratory Fellows Program and Chemistry Teaching Fellows Program, have proven to be successful. We have hired LEAP High School students, undergraduate students and graduate students from Rutgers University, Drexel University and Camden County College as STEAM fellows to help us conduct trainings, teaching, projects and grants, not only for the students but to the faculty members and the community. We are excited to report that, in collaboration with the Rutgers Community Leadership Center, we won the Social Justice Challenge award, a national competition, from the Rutgers-Newark School of Public Policy and Administration. In addition, for the second consecutive year, in collaboration with the Department of Chemistry at Rutgers, we won the American Chemistry Society SEED Fellow Award to hire a high school student from Leap Academy to perform research investigation into creating biomaterials. Furthermore, we participated in the two state wide events: the NJ Makers Fair at Toms River Regional School and our own LEAP Academy NJ Makers Day. Both events were very successful. At the LEAP NJ Maker Day we involved our local community into STEAM projects and trainings. More than 120 participants attended the event. With our community and state engagement, we are happy to report that we were selected as part of team with the school as the NJ Department of Education Innovation School and the Civic Engagement Award as Community Partners from Rutgers University Camden. We are very excited to be

part of an excellent school program that as team can be recognized by our community. Furthermore, we have collaborated with the Rutgers Child Study Program to create toys for Rutgers Toy Design Course and the Department of Fine Arts. Our LEAP student fellows were critical for the success of these two partnerships. Our skillful students and team members (including teachers) have designed, created and manufactured products that are currently being sold in our Innovation Store. In addition, our students have designed prototypes for outside clients enabling us to position our fab. lab. as a design and manufacture laboratory well recognized outside of the state. We are hoping to continue our efforts to help our local community with trainings and professional education. It is with great excitement and enthusiasm that we will continue our commitment in working with the student and teachers to make our program recognized and world class. For the next academic year we will focus on student product development, teacher training, store development and community education. Also, if you are reading this, I invite you to explore our website. We recently re-designed it to include new features, and we are working on adding videos of our projects and the Innovation Store's ordering page. Please keep in touch with us via our website and our community links or contact me directly with news ideas, comments or suggestions at [david.salas@camden.rutgers.edu](mailto:david.salas@camden.rutgers.edu). Sincerely,  
Dr. David Salas de la Cruz,  
Assistant Professor  
Faculty Director Fabrication Laboratory



# MESSAGE FROM THE DIRECTOR



Dear LEAP friends and community members,

One student told me that he loves being in the Fab-Lab because he can develop and learn new skills that are directly applicable to his community. In other words, our program is not just about the technology, it is about teaching our students the skills that will prepare them to be global citizens.

In view of this we have exposed our students to challenging design projects and provided them with cutting edge technology to develop local solutions to global problems. This year we moved to a new state of the art 2,000 sq. ft. Facility with fourteen 3D printers, one laser cutter, one cnc router, wood working tools and studio tables. Nevertheless, all this equipment and technology by itself doesn't do much, it needs the teaching component. In view of this, we developed a strong support system for our teachers that can translate directly to positive student outcomes. We've had a diverse group of teachers from a variety of backgrounds and content areas, such as Engineering, Science, Chemistry, Physics, Biology, Math, Latin American Studies, Industrial Art, Spanish and Business. Our teachers

play a very crucial role in our mission to build global citizens. They are constantly finding new, creative and innovative ways to develop engaging projects with the students.

Moreover, this year was our first participation as a site for the New Jersey Makers Day. On Saturday March 19, we became part of a network of makers' spaces, libraries, schools and community centers through New Jersey. During this day we hosted a series of workshops to build capacity and skills in our community. The workshops ranged from computer coding, 3D printing, Puerto Rican Digital Arts, composting, digital electronics, sewing, crayon recycling, and robotics. I was a fun and exciting day where LEAP families, staff, teachers and the general community were exposed to cutting edge technology and skills directly applicable to their community needs.

Another important milestone was the planning and implementation of a school based enterprise; the LEAP Academy Innovation Store. The Innovation Store provides an opportunity for students to develop managerial, marketing, supervision and leadership skills. Moreover, the school store functions as a lab where LEAP students can implement and apply in a real world scenario concepts and theoretical skills learned in the Business classes. The LEAP Academy School Store is an innovative and vibrant space that provides students and staff with LEAP pride merchandise and fab-lab created products.

Furthermore, another exciting project that we started this year is the Urban Food Forest. An interdisciplinary team of LEAP and Rutgers students and staff

with the leadership and support of Dr. Gloria Bonilla-Santiago, developed a proposal that earned \$5,000 from the Rutgers–Newark School of Public Policy and Administration. The judges were particularly impressed by the style and content of the students' presentation, given on Nov. 23 at Rutgers–Newark.

The students have been busy designing the planters, sowing the veggie seedlings and watering the plants. In fact, the kindergarten teachers have taken the lead and take turns watering the plants with the students every day. By fall we should have our first crop of fresh, organic veggies.

Building global citizens is our vision and our projects and program pave the way for students and families to become global citizens. For the next academic year we will jumpstart our Gifted and Talented Enrichment Summer Program for LEAP students as well as the scaling of the Fab-Lab Project Based Learning through our district. Moreover, the Fab-Lab will start collaborating with the Parent Institute to build entrepreneurship capacity in our families and provide our parents with skills and exposure to cutting edge technology. These are exciting and innovative times and I am happy to be part of the team that makes it happen.

Carlos Mattei-Ramos  
Director of the Fab-Lab  
LEAP Academy University Charter School

## LEAP Academy Board of Trustees:

**Gloria Bonilla-Santiago, Ph.D.**, Chairperson/Rutgers Representative  
**Phoebe A. Haddon, J.D., LL.M.**, Rutgers Representative  
**Marleen Gonzalez**, Parent Representative  
**Mathew Goodwin**, Parent Representative  
**John C. Hall**, Public Member  
**Cal Maradonna**, Public Member  
**Heather Matuszewski**, Burke Public Member  
**Brenda Ortiz**, Parent Representative  
**Michael A. Palis, Ph.D.**, Public Member  
**Patricia Peña**, Public Member  
**Jennifer Perkins Young**, Public Member  
**Robert Ransom**, Public Member  
**Melinda Sanchez**, MCP, Public Member  
**Omar-Samaniego**, Public Member  
**Horacio Sosa, Ph.D.**, Public Member  
**Donald Borden**, Public Member  
**Hector Nieves**, Parent Representative  
**Wanda Garcia, MSW**, Board Liaison



## Leadership Team:

**Manuel Delgado**, Lead Person  
**Yvette Hernandez**, Chief Academic Officer  
**Ken Verril**, Chief Financial Officer  
**Dr. Dyanne Westerberg**, Chief Medical Officer  
**Khary Golden**, Chief Innovation Officer  
**Anthony DePetris**, Chief of Staff  
**Tameka Mathews**, Director of Principal Leadership  
**Nancy Ruiz**, STEM HS Principal  
**Jorge Calixto**, STEM MS Principal  
**Barbara Dunlap**, Upper Elem. Principal  
**Jovita Veguilla**, Lower Elem. Principal  
**Elizabeth Class**, Director PRAC  
**Maria Cruz**, Director LEAP Parent Center  
**Danielle Lopez**, Parent Engagement Program  
**Gladys Robreno**, Director Family Support  
**Janice Stright**, Supervisor Science and Technology  
**Stevenson Pierre**, Director of Technology

## Technical Team:

**Undergraduate Fellows**  
**Victoria Mateo**, Camden County College  
**Patrick Martin**, Rutgers-Camden  
**Shawn Hadid**, Rutgers-Camden  
**Mark Paulson**, Rutgers-Camden  
**Josh Verril**, Rutgers-Camden  
**Chris Cherfane**, Rutgers-Camden  
**Hideki Yamamoto**, Rutgers-Camden  
**James Ramos**, Rutgers-Camden  
**Whaldo Mendez**, Rutgers-Camden  
**Kate Lorusso**, Rutgers-Camden  
**Liz Ramos**, Rutgers-Camden

**Graduate Teacher Fellows**  
**Timnit Kefela**, Rutgers-Camden  
**Cody Stevens**, Rutgers-Camden  
**Daphney Chery**, Drexel University

**LEAP Fellows:**  
**Eduardo Cruz**, LEAP Academy  
**Karina Velez**, LEAP Academy  
**Jean Carlos Pelegrin**, LEAP Academy  
**Bielka Gonzalez**, LEAP Academy

## Teaching Team:

**Steven Brownstein**, Engineering, STEAM HS  
**Silvia Vazquez**, Engineering, Upper Elementary  
**Lissel Vasilakis**, Spanish, Lower Elementary  
**Beth Goodman**, Technology, Lower Elementary  
**Kristen Perrine**, Science, Upper Elementary  
**Dan Klehamer**, Physics and Robotics, STEM MS  
**Luis Declet**, Latin Studies  
**Mary Rosemiller**, Chemistry, STEAM HS  
**Neil Goldman**, Chemistry, STEAM HS  
**Helen Redmond**, Business Academy, STEAM HS  
**Drew Favat**, Math, STEAM HS  
**Jeffrey Chiusano**, Engineering, STEAM HS & STEM MS

# The Fab-Lab mission: to Build Capacity in our School and Community

In responding to the critical need for diversity in STEAM fields and to reduce the gap in experiences that engage minority students in such fields, through preparation, motivate and exposition, we aim to jumpstart

not only the academy growth of our students, but also the growth of a city that has been left underdeveloped. In tackling the status quo with our initiatives, we at LEAP Academy's FabLab hope that by utilizing the School's holistic approach, which includes an adequate environment

and philosophical foundations, that support the development of innovative and customized learning structures, we may create a positive impact in the future of collaborative environment between the LEAP family and community.



## New Jersey Makers Day



James Ramos, LEAP alumni, Chris Cerfane, Elizabeht Class and Steve Brownstein during the Makers Day.



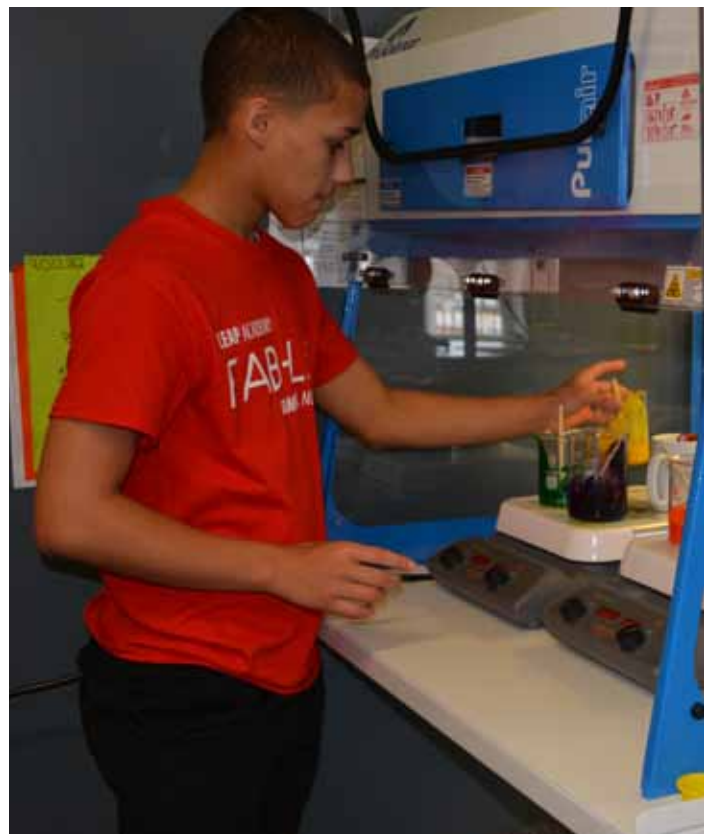
During the New Jersey Makers Day LEAP Academy Fab-Lab hosted 10 community workshops on STEAM technologies. These included, 3d Printing your name, Puerto Rican Digital Arts, Computer Coding, Composting, and Crayon Recycling, among others.

We had over 100 attendees including LEAP families, Staff and staff families, LEAP and Rutgers students, Rutgers Professors and the general Camden Community. This is a great example of our commitment to build global citizens and create capacity in our community.





Mr. Steven Brownstein, Engineering Design teacher spearheads the Makey-Makey workshop during the NJ Makers Day.



Karina Velez, Fab-Lab fellow and Calix Ortiz, LEAP students during the crayon recycling workshop at the NJ Makers Day.

## Rutgers Civic Engagement Award

This award recognizes the LEAP Academy University Charter School's extraordinary service to the children of the city of Camden. The Fab-Lab team played an important role in LEAP innovative efforts and community outreach.

Recipients of Chancellor's Awards for Civic Engagement in the Rutgers-Camden Campus.

## Rutgers Day



Jean Carlos Pelegrin, LEAP Fellow assists a child and a parent on using design software.

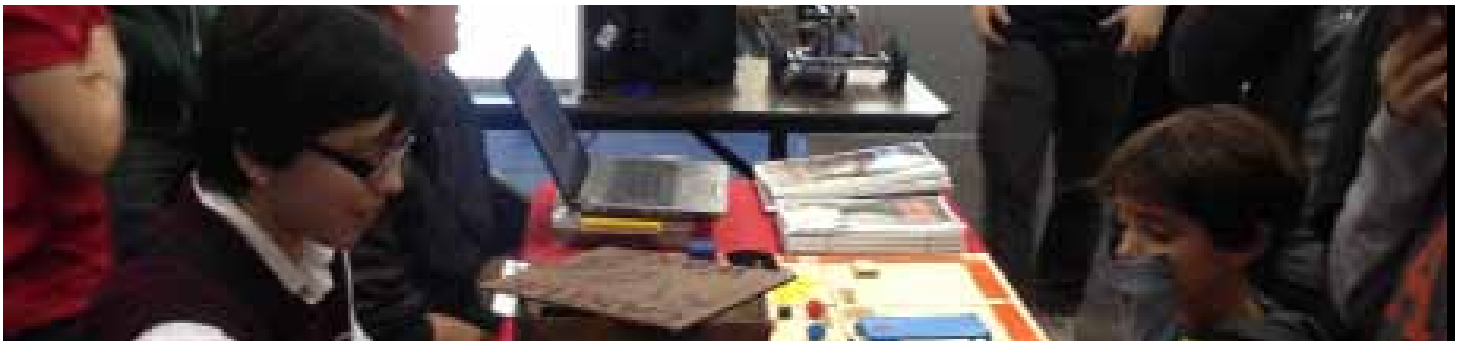
## Jersey Shore Makers Fest



LEAP students teach youngster during the South Jersey Makers Fest.



The Fab-Lab team during the Makers Fest.





## Camden Enrolment



Carlos Mattei, Director of the Fab-Lab and Dr. David Salas, Faculty Director at Camden Schools enrollment event.



Camden enrollment attendees.

## Fun Day at the Neighborhood Center



Victoria Mateo, LEAP Alumni and Fab-Lab Fellow, Karina Vazquez, LEAP student and Fab-Lab Fellow and Elizabeth Class give a workshop at the Neighborhood Center on how to make origami



## From making to entrepreneurship: the innovation store.

The LEAP Academy School Store is an innovative and vibrant space that provides students and staff with day to day school basics and LEAP pride merchandise. Our products include t-shirts, buttons, keychains and several services such as 3d modeling and printing, laser cutting and engraving and woodwork. We have performed design and fabrication work to Rutgers - Camden as well as various private clients. Projects and services sold includes event plaques, t-shirts, custom product prototyping, and memorabilia. Moreover, our space has been used by Rutgers University Childhood Studies Department to custom fabricate toys. During this project our LEAP Fellows assisted college students on the use of 3d printing software. This is an example of how our Fab-Lab helps build global citizens through innovation.



Karina Velez, LEAP student and Fab-Lab fellow spearheads the Innovation Store.



The Innovation Store in action.



## Rutgers-Camden Childhood Studies

Dr. Meredith Bak, from Rutgers-Camden Department of Childhood Studies used our resources and facility for her Toy Design class. During her class LEAP Fellows assisted her students with the use of 3d printers. This in turn exposed our students to a new college level experience.

Rutgers Childhood Studies class uses our Fab-Lab to 3d print their projects.



Dr. Meredith Bak, Assistant Profesor from the Department of Childhood Studies at Rutgers - Camden. Here with her Toy Design class. Our LEAP Fellows assited Dr. Bak students in the use of 3d printers.



# Innovative affiliations: our cutting edge network

## Futures Ready Schools

Future Ready Schools helps district leaders plan and implement personalized, research-based digital learning strategies so all students can achieve their full potential. LEAP Academy is currently implementing a series of assessment that will assist us in the alignment of digital learning strategies.

## Makers Promise

Digital Promise and Maker Ed launched the Maker Promise, a campaign to equip more students with resources to make. The Fab-Lab team signed the Maker Promise. This signifies a concrete commitment to dedicate an space for making, designate a champion of making and display what our students make.

## Innovate NJ

innovateNJ is New Jersey's initiative to support innovation and practice by fostering sharing and collaboration, and cultivating projects. LEAP Academy is part of the Cohort 3, which means that we have demonstrated a commitment to providing, designing, and implementing innovative school environments.

# Collaborations with other LEAP Centers of Excellence

The Fab-Lab is part of the school innovation team and plays an important role in maintainig a cohesion between the varied innovative departments. These collaborations open the door for creative and innovative solutions with a strong community engagement. AMong the collaborations are the design and fabrication of memorabilia for the Walkathon & Health Fair, the development of a extended day parent program with the Parent Institute,



Eduardo Cruz, Fab-Lab fellow explains to Dr. Bonilla-Santiago his domino table project.



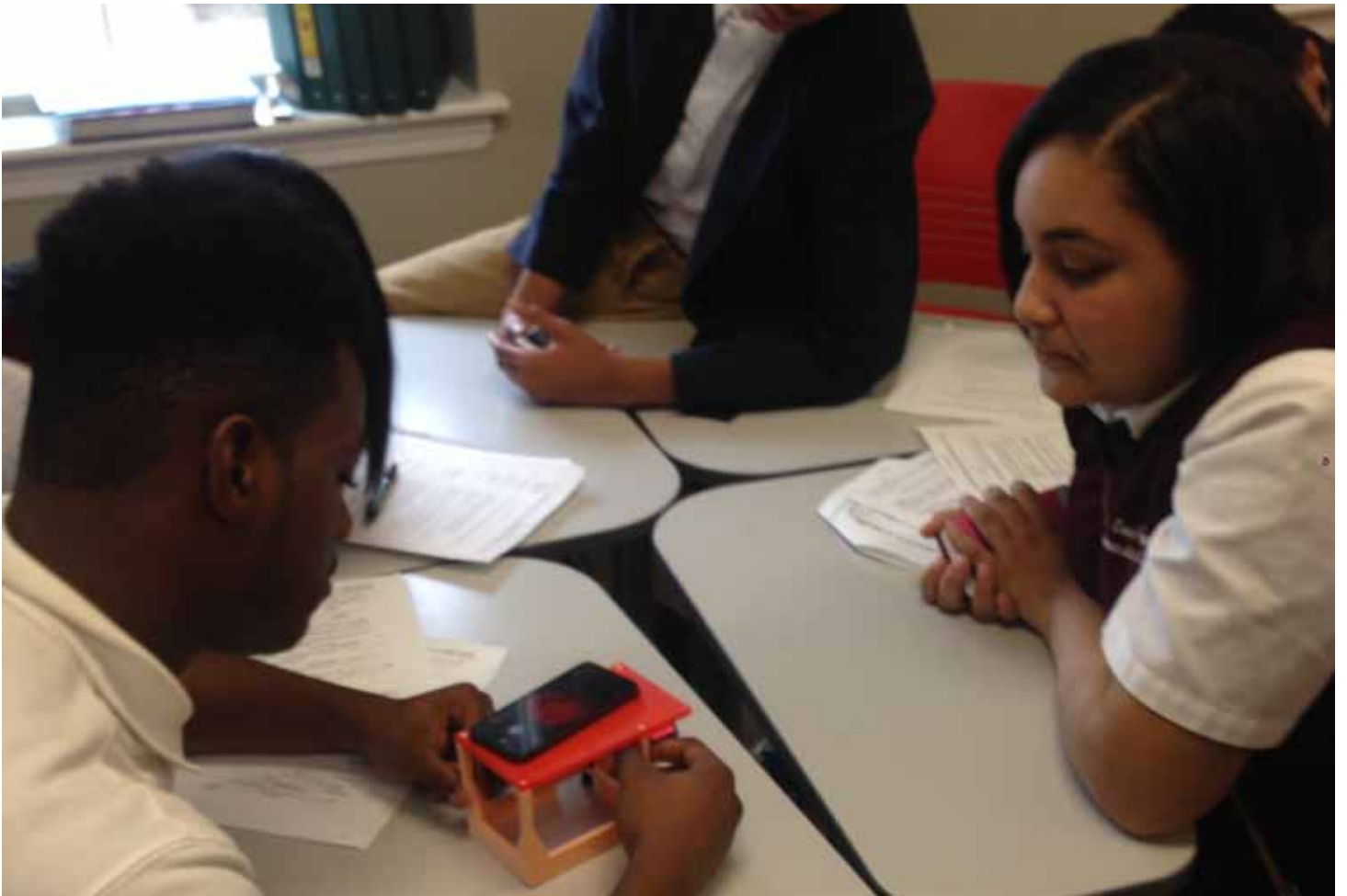
Eduardo Cruz, working on his domino table with Elizabeth Class.



Eduardo's dominoes.



Keychain designs for the Walkathon and the Health and Wellness Center.



Ms. Helen Redmond Business class test drive the 3d printed microscope



James Ramos, LEAP alumni, Eduardo Cruz, LEAP Fellow and Carlos Mattei, Director of the Fab-Lab collaborate with the other LEAP centers of Excellence during the Parents Fair.

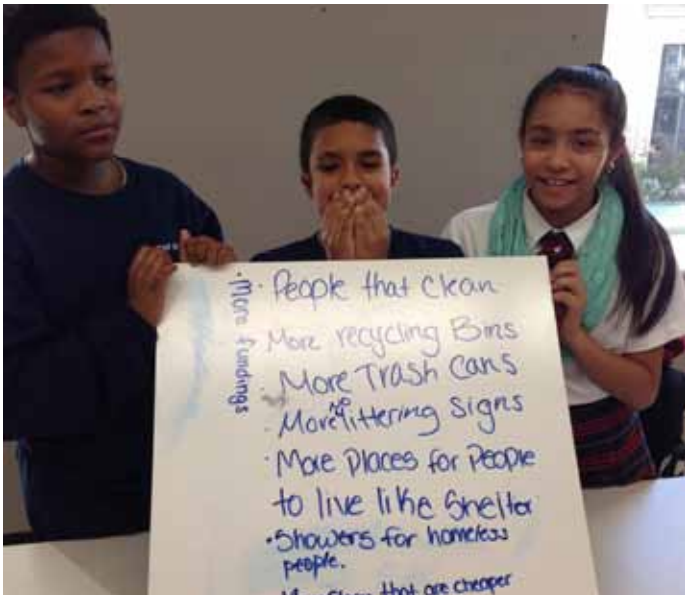


# Building global citizens with innovative practices: project base learning as an instructional tool.

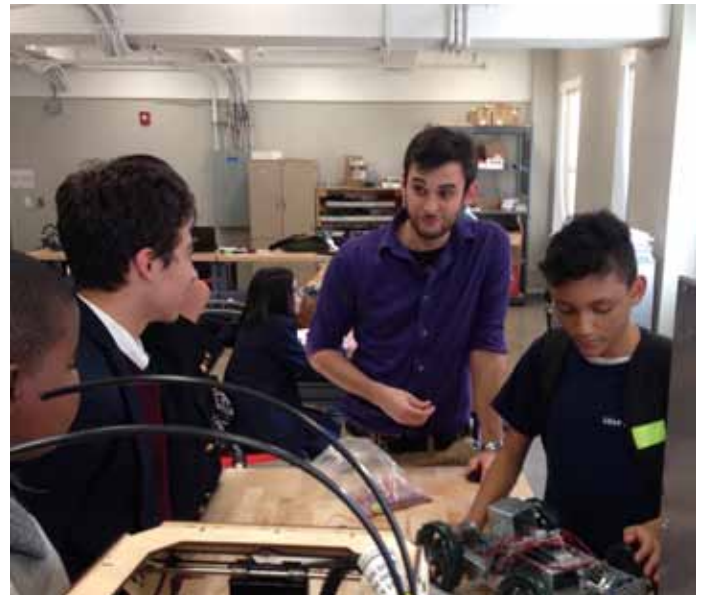
Teachers in the Fab-Lab are constantly searching for innovative ways to engage with students. With a strong support form the Fab-Lab staff and Rutgers Fellows

the teachers are able to develop quality content in aligent with the Next Gen Science Standards and Standard 8.2 of the New Jersey Core Curriculum Content Standard.

This is a gerat time to be part of the Fab-Lab team!



Ms. Silvia Vazquez students brainstorm ideas on how to make Camden better.



Mr. Dan Klehamer, Phisycs teacher with students from his Robotics Club.

## In the news: South Jersey students target STEM gender gap

Our efforts for STEM equality and social justice recently got nationwide coverage in the Courier Post. <http://www.courierpostonline.com/story/news/local/south-jersey/2015/11/02/women-stem-gender-gap-science-technology-engineering-math/74616500/>



LEAP juniors Thalia Garcia-Curet and Rickea Bell work on the 3d printers.



LEAP students work on a project using a 3d printer.



Mr. Luis Delet, teacher of Latin American Studies uses the Fab-Lab to develop projects with his students.

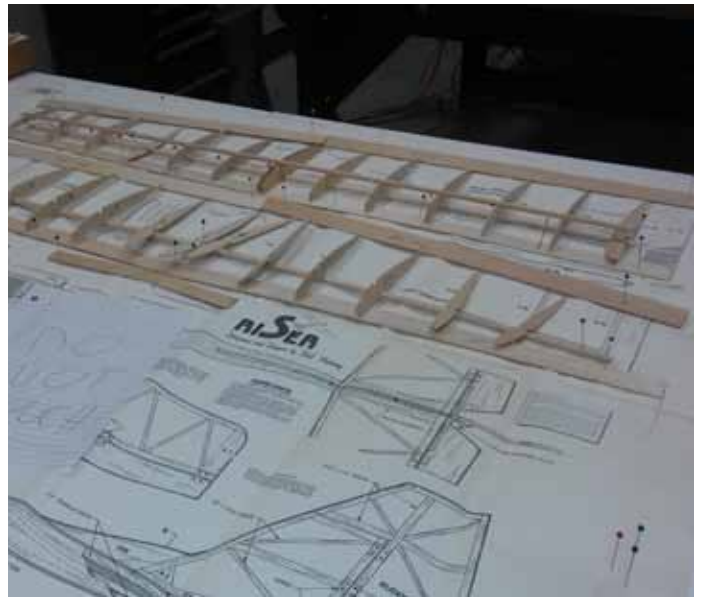


Mr. Steve Brownstein, Engineering teacher with his students.





LEAP Fab-Lab in the skies! Delivery of the composite one passenger plane to LEAP. Our students will have the experience of building a real working plane.



As part of the airplane project, our Aerospace class students are assembling a model plane.



Justin Estevez works on his Engineering Capstone project for Mr. Steve Brownstein class



Kelvin Taveras, Azaris Melendez and Stephen Young, all LEAP engineering students work on a project in the Fab-Lab

## What is “project base learning”?

Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an engaging and complex question, problem, or challenge. Essential Project Design Elements include:

- Key Knowledge, Understanding, and Success Skills
- Challenging Problem or Question
- Sustained Inquiry
- Authenticity
- Student Voice & Choice
- Reflection
- Critique & Revision
- Public Product

[http://bie.org/about/what\\_pbl](http://bie.org/about/what_pbl)



Dr. Gloria Bonilla-Santiago, Dr. David Salas de la Cruz with Darlene Williams from American Waters.





Justin Estevez works on his Engineering Capstone project for Mr. Steve Brownstein class



Carlos Mattei-Ramos, Director of the Fab-Lab, explains the microscope project to Darlene Williams from American Waters.



Dr. David Salas de la Cruz explains our portable water filter to Susan N. Story, President and Chief Executive Officer of American Waters.



Josh Torres works on a his engineering project.



Dr. Gloria Bonilla-Santiago, LEAP founder and Board Chair tries a virtual reality drone. By her side Dr. David Salas de la Cruz, Faculty Director and Matthew Closter, Research Associate at Rutgers Community Leadership Center.

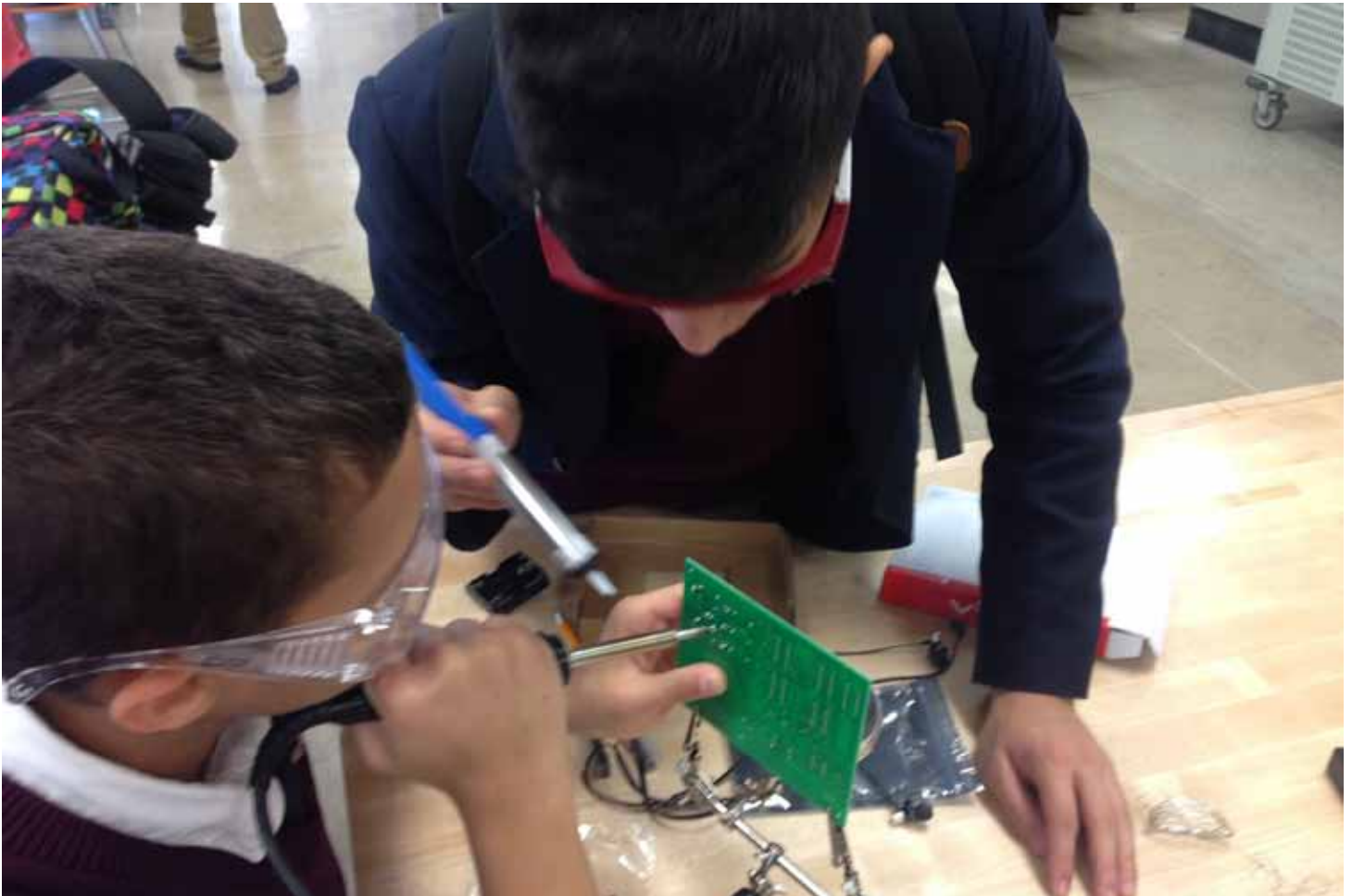


# The Fab-Lab Club: an innovative afterschool program

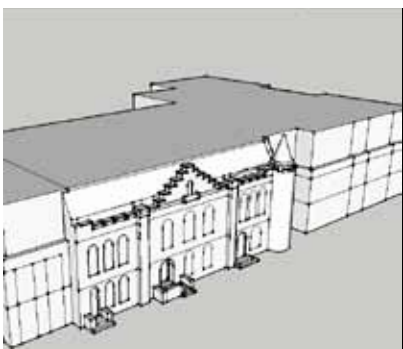
LEAP's vision of building global citizens does not ends at 4:00pm. Our vision and commitment with our students goes beyond the regular school hours, that is the mission of the Fab-Lab Club, to

give our students the tools and skills necessary to support their role as global citizens. The Fab-Lab club is a program design to give students a space to continue working on their class projects, particularly

engineering, in a more focused and individualized context, with strong support from the Lab fellows and teachers. Below are examples of our current projects:



Calix Ortiz and Javier Morales from the Engineering Academy learn how to solder circuits as part of the Digital Electronics class.



3d digital models of LEAP Academy Buildings. The models have been designed under the leadership of Victoria Mateo, LEAP alumni and student at Camden County Community College.

## From food desert to food forest

Camden is an USDA designated food dessert. Currently the city has a myriad of environmental challenges such as polluted water and air, contaminated soil and dumping from polluting industrial facilities. The LEAP Academy Urban Food Forest is our attempt to bring environmental justice to Camden. A team of LEAP students in collaboration with Rutgers graduate and undergraduate studetns won a nationwide grant to develop an Urban Food Forest in Camden. We will have locally grown veggies and fruits soon!



At the far left, the team of LEAP and Rutgers students in charge of developing the Urban F0od Forest project during the proposal presentation.



Community volunteers sowing the veggie seedlings at the Food Forest.



# Rutgers fellows program: exposing our students to real world problem solving experience and college readiness

We are excited to report that a total of 19 students fellows participated in our 2015-2016 program. From this total, 4 participants were high school students from the Leap Academy Charter School, 12 participants were undergraduate students from Rutgers University and 1 participant from Camden County Community College, 2 participants were graduate students from Rutgers University

and 1 participant was a graduate student from Drexel University. The three graduate students participated as teaching fellows in Chemistry. The fellows focused their work into helping teacher, staff and students in developing and implementing STEAM-based program during regular operating hours and during afternoon programs. In addition, the fellows trained students, staff and outside participant in the operation of our various instruments and equipment. The students participated in STEAM curriculum

development with more than 10 STEAM teachers ranging from K to 12 grades. The fellows performed product developed and manufacturing for our new Innovation Store serving our school and Rutgers University in various events. Our current and future goal is to establish and provide an environment where teacher and students can collaborate into designing, implementing and execution STEAM-based curricular concentrated on experiential projects.



Elizabeth Class, Coordinator of the PRAC, Eduardo Cruz, LEAP Fellow, Shawna Cejas, LEAP student and Christopher Churfane, Rutgers Fellow, collaborate on a project.



Eduardo Cruz, LEAP Fellow and Shawna Cejas, LEAP student work on a project during Fab-Lab club.

## Projects with Rutgers:

- Mailbox for Lower Elementary School
- Flight Simulator Control
- Portable Water Filter
- Camden City Model
- PRAC Dominoes & Domino Tables
- Urban Food Forest
- Alfredo Santiago Gala Plaques and Memorabilia
- Walkathon Memorabilia

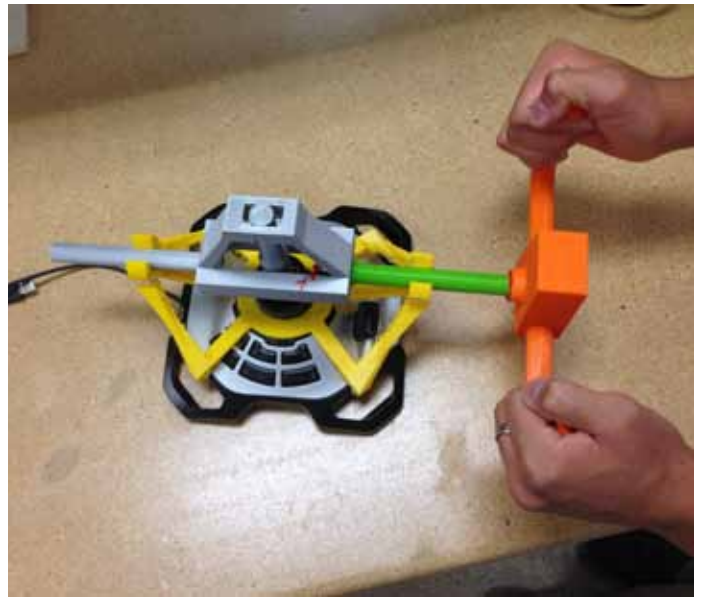


James Ramos, LEAP alumni and Fab-Lab Fellow explains the concept of interactive educational games to Dr. Gloria Bonilla-Santiago, founder of LEAP Academy and Maria Cruz, Director of the Parent Unit.

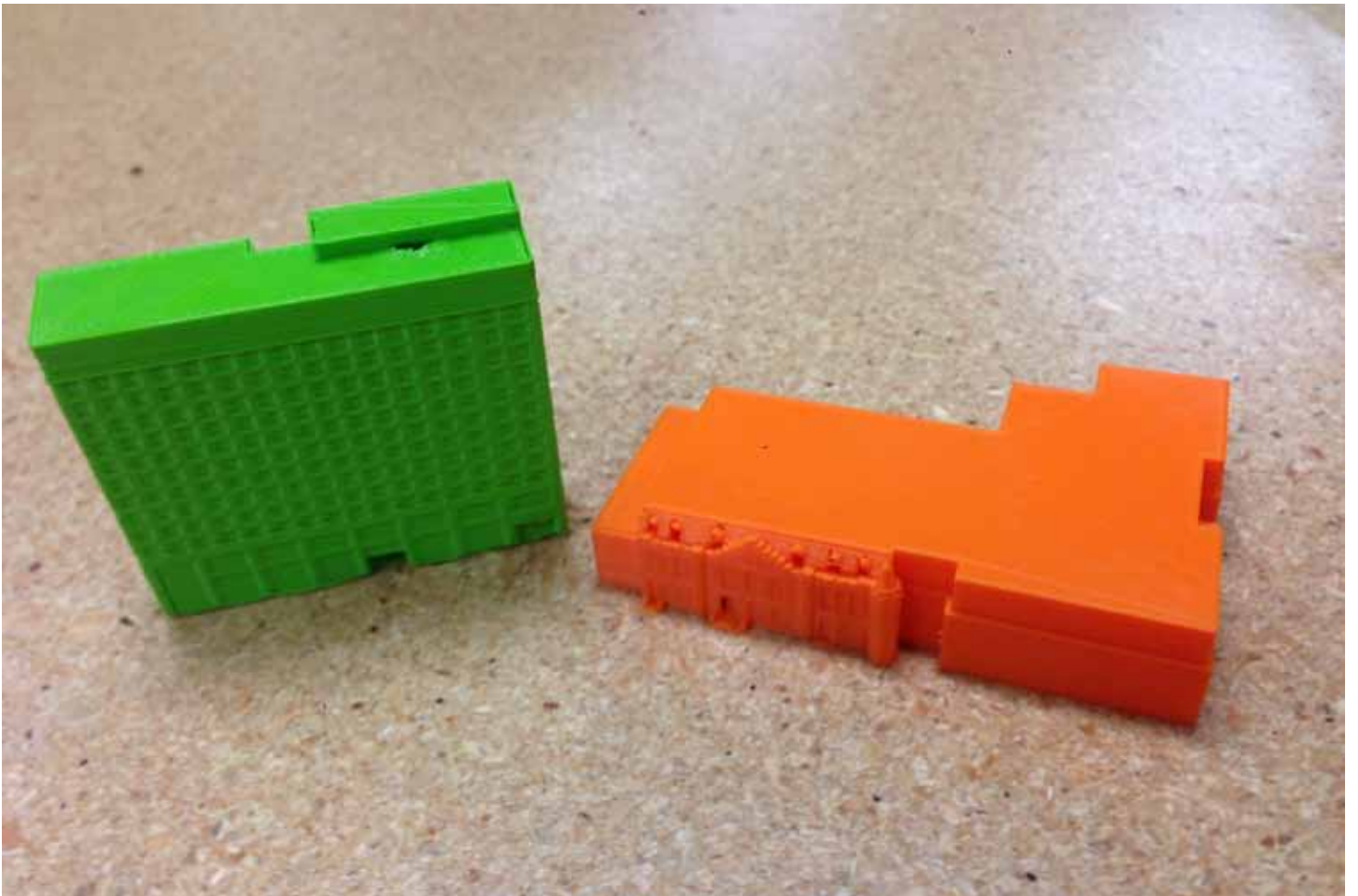




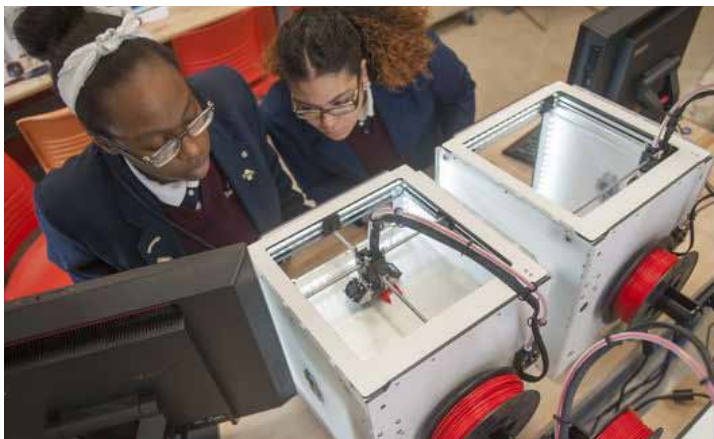
Recycled water bottle bird feeder designed by Mr. Brownstein Engineering class students.



Flight simulator controller designed by our Rutgers Fellow Patrick Martin.



3d printed models of LEAP Academy Dr. Gloria Bonilla-Santiago Building and the STEM Castle Building designed by our Fellow and LEAP Alumni Virginia Mateo.



**Save the date: Saturday, March 25th, 2017**  
**New Jersey Makers Day at LEAP Academy STEAM High School**



[www.leapacademycharter.org/LEAPfablab.html](http://www.leapacademycharter.org/LEAPfablab.html)

Dr. Gloria Bonilla-Santiago Building, 3rd floor, 130 north Broadway St., Camden, NJ, 08102