Spring 2020 Semester Overview

by Dieuwertje Kast

This time last year, our staff supported our partner Los Angeles Unified School District teachers with their district-wide strike. This year we had to cancel on-site programming early due to the ongoing COVID-19 (aka “coronavirus”) pandemic. Due to proactive and preventative protocols established by the university, the state and the nation, LAUSD closed all schools and both USC and LAUSD educational programming was moved on-line mid-March.

With all the changes, our scheduled Drone Workshop at Foshay Elementary was cancelled, as were professional development workshops for teachers scheduled for March and April. We are a strong community with fierce advocates for our students and teachers and we know that we will all get through this together. YSP TA’s were assigned remote work, such as creating instructional videos of our content, creating blogs about their experiences in the community and putting together research projects about the data we collect, all of which will continue to benefit our program and the communities we serve. We even had our last staff meeting virtually through Zoom to remain connected. (see photo below)

We are happy to share some positive updates from earlier in the semester! We received a Centennial grant from the American Geophysical Union (AGU) to cover the cost of installing an Augmented Reality Sandbox at each of our partner schools. Deezemaker’s Diego Porqueras was the mastermind behind the design. We were able to install two sandboxes at the start of the semester, and will continue to install the rest in the fall 2020 semester.

Our partnership with the Los Angeles Mayor’s Office’s Women in STEM Los Angeles (W i S T E M L A ) Initiative and the robotics company Ozobot has continued to blossom. Ozobot generously donated 85 Educator Entry kits for each one of our teachers so that we can increase their access to high quality robotics education opportunities. Some of our own staff even created lesson plan content that will be featured on Ozobot’s website!

The JEP STEM Programs are hoping that everyone is well and safe. We’d like to thank our funders: Good Neighbors Campaign, the Winn Family, Raytheon, and AIAA, for their support and partnership, but we do emphasize that current and new support and partnerships will be necessary moving forward.

We would like to thank Ms. Sookin Busch, one of the fourth-grade teachers at 32nd Street Elementary School receiving her Ozobot from her class’ YSP TA Rita Barakat. (see photo below)

Follow us on social media to get weekly updates on all of our STEM Programs!

@USCYoungScientistsProgram
@STEMJEP
@JEP_STEM
@JEP STEM Programs
I remember meeting DJ at an informational session for YSP. She was wearing a signature science dress and spoke about a program that brought interactive science lessons to the schools surrounding USC. I immediately thought, “Now, THESE are my kind of people!” I emailed her for an application and then went down a rabbit hole looking up science-themed clothing. I was excited about my two discoveries that day.

That fall, I joined YSP as a fourth grade TA at Norwood Elementary. I taught three classes on Fridays, making it the perfect ending to my week. The students captured my heart and inspired me with every “ah-ha!” moment, a million interesting questions, and instances when they challenged themselves to be creative within the experiment. This is how science is supposed to be experienced in a collaborative and fun way. I was proud to be a part of YSP and give back to these communities that don’t always have the resources to showcase science in this way. These are the same communities I grew up in and it was fantastic to see a program creating access to STEM at such a crucial age.

I also gravitated toward YSP because in my spare time I was developing my own form of outreach by combining my love of science and theatre. In 2017, I worked with Phantom Projects Theatre Group to launch “Jargie the Science Girl!” a live, science show that toured around Southern California schools. After a year and a half of workshopping the show in small groups, we expanded and created a larger version fit for the theatre stage.

Our national touring show debuted in 2019 at the Smithsonian Institute’s Discovery Theatre, followed immediately by a stop in Edmonds, WA. We grew from sharing our scientific adventure with 100 students to 1,400 per show day. Of course, a big part of our expansion was offering a bilingual version to Spanish-speaking communities. Even with larger audiences, I still feel like I’m teaching in a classroom around USC, showing students that science is fun, creative, and most importantly, within their reach.

Recently, I was chosen as a PolarTREC educator and spent five weeks in Antarctica working with the IceCube Neutrino Observatory at the South Pole. I packed my pink Jargie lab coat, my penguin lab assistant, and flew south to learn about how scientists do research in one of the coldest, most remote places on the planet. I shared my experience through social media and blog posts, highlighting polar life and IceCube science. Now that I’m home, I plan to continue sharing the South Pole through Jargie and my own talks at schools and libraries. Besides being “cool,” the South Pole is a captivating example of how science expands beyond the walls of a traditional laboratory. It levels a scientist with an adventurer and the best part is that you don’t have to hop on a plane to explore something new. Sometimes the grandest adventure can come from making slime in a Los Angeles classroom.
YSP TA Spotlight: Angelina Crittenden

by Angelina Crittenden

I am a sophomore studying Human Biology at USC and I am currently a teaching assistant for the Young Scientists (YSP) and Medical STEM (MSP) Programs. Like the students I teach through these programs, I grew up in South Central Los Angeles, a mainly African American/Latino and low-income community. However, I commuted every day to schools in Cerritos, California. There, I attended the number one school in the state, Whitney High, from 7th-12th grade.

During my time in secondary school, I noticed a growing gap between myself and my neighbors. I was writing literature reviews on forensic science; my fellow 9th graders across the street struggled to read at grade level. My goal of helping to correct this injustice of individuals attending public institutions mere miles apart showing such a dissonance in learning led me to YSP and MSP.

The goals of YSP and MSP are to improve science literacy and provide hands-on experiments to our students. The lessons follow Next Generation Science Standards for each grade level, but we TAs tailor each lesson to the specific needs of our classes. For example, one of my YSP classes had multiple English-language learners. I made sure students in this class were paired with bilingual/multilingual students and that they had vocabulary words in their languages. I also encouraged them to participate, as they were often too shy to do so during typical class time.

When explaining scientific concepts, we use real-world examples that students may find in their homes and communities to further solidify ideas. In one of our 4th grade lessons, we explored symbiotic relationships in ecosystems. One of my students reminded me that just as some animals depend on one another for survival, humans depend on each other too. He told the class that farmers and other people have a symbiotic relationship - farmers produce food, and we pay them for those crops. It's imperative that students see how their lives relate to the world around us.

Before I began teaching my YSP students, they took a “Draw a Scientist” test. Some of them drew doctors, others drew Albert Einstein. The common theme was that students drew mostly white, male figures. After several weeks of YSP, most of my students drew themselves! Representation is key in STEM curriculum because students of color may not think they can even enter science fields if they don’t see themselves represented. Fortunately, programs like YSP and MSP let students know that they are scientists and that they do belong.

I am inspired to teach for YSP and MSP because I want students in my community to receive the same level of support and motivation that I did. When children grow up in poverty, they are less likely to feel like they can achieve because they may lack resources and support. I want students to know that they are capable, that they are worthy, and that they must keep asking questions. After just one lesson, I could see the intrinsic curiosity of my students. STEM education is so important, especially in low-income communities, because we are priming students to be independent thinkers. STEM skills apply everywhere, not just in a laboratory. Students in YSP and MSP know how to ask questions, make educated predictions, test hypotheses, and draw conclusions about their findings. More importantly, they believe they can achieve.
Introducing Yvonne Hernandez and Eduardo Lopez, first generation college students at USC and Neighborhood Academic Initiative Scholars: from South Central, teaching in South Central. This is their story.

Yvonne:
Growing up in South Central I was not really exposed to the best resources to get excited about education. In elementary and middle school, the science portion exposed to me was little to non-existent. Because I was accepted into the USC Neighborhood Academic Initiative (NAI) program, I attended Saturday Academy. On these Saturdays, NAI would incorporate science classes. Here is where I was really exposed to science and all the fascinating experiments. One particular experiment that struck my interest in science was the cow eye dissection. I was never exposed to any real animal parts for the purpose of exploring it and learning about it. After cutting into the many layers of the eye and observing how it is structured, I was immediately interested in what other experiments NAI had to offer. Because NAI was there all throughout my middle and high school journey, exposing me to more science, my interest in it and in school in general increased. Now, being part of the staff for the Joint Educational Project (JEP) and its Norris Comprehensive Cancer Center (NCCC) sponsored Medical STEM Program (MSP), I am able to practice my passions within the same community that I grew up in but I am also able to really be who I am because of the people involved in the program. JEP’s MSP has really pushed me to become a better educator for the students. Knowing I have both the NAI family and JEP family by my side makes it a lot easier for a first-generation student to not only survive college but thrive in it.

With my own experience teaching kids, I realized that all kids are excited to learn, they just need someone to view them as capable of learning. I got the opportunity to teach two different classes. I co-taught medical- and cancer-themed topics with Ms. Robles’s class with Eduardo Lopez and then moved into Mr. Nakama’s classroom. Both were second grade classrooms, but they came with different teaching environments and very different teaching experiences. I did my best to really get the students interested in science.

One memorable moment I had with a student was when we were working the Dermatology unit—a unit that discusses skin layers, cancer, skin damages—more specifically the lesson on stitches. I was helping one student with his stitches. This student needs extra aid in the class because of characteristics that may classify him as autistic. With my help, he was able to complete the stitches in a neat manner. I got really excited for him and told him he was one step closer to becoming a scientist. When he heard this, his eyes lit up so brightly, his smile grew wider; he was so happy to hear this type of encouragement. After that experience, he was constantly helping me with the lessons. He would eagerly read the book for the class, and pass out papers from time to time. Even with little gestures, students are able to see when a teacher is there for them. I saw that treating students with respect can really change the way they see themselves. They begin to really believe that they are smart enough to learn very dense and heavy lessons.

Yvonne and Eduardo have gone on almost every life journey together. Friends since Middle School, they both participated in USC’s Neighborhood Academic Initiative, and both proudly claimed a spot at USC (left above, they declare their intention to attend USC for college).

Now they both work as TAs in the Medical STEM Program (right above,Yvonne reading to one of her classes), teaching in the same community they grew up in.

By becoming a teacher, I will be able to be the person I needed growing up and will be able to support students who come from the same background as me. Having the opportunity to teach in my community is honestly everything to me. I value my community and anything that involves me giving back to the people that helped me become the young woman I am today. Through my experience with teaching young kids from my community, I really see the importance of education. Seeing all the things that education does for kids is something so remarkable that it made me realize that teaching is something I want to do as a career.
Eduardo:

As a South Central native, I understand exactly what it’s like being a student in LAUSD. I attended Lenicia B. Weemes Elementary School from PreK-5th grade. Weemes Elementary School is a school just down the street from USC that has a partnership with the JEP program. Although my teachers at Weemes tried their best to expose me to as many activities as they could, the limited financial resources constrained what they could teach me. Mr. Abelson, a teacher who had many connections with JEP, was one of the few teachers who expanded my thirst for science. I vividly remember our earth sciences lab in my 4th-grade class. Mr. Abelson let us conduct our own erosion lab using dirt, water, and an aluminum tray. I didn’t realize it until recently that these creative, unique, and cost-efficient activities were all made possible because of the JEP programming. These activities are crucial towards increasing the interest of students, like me, in other activities besides the district implemented curriculum.

Additionally, NAI was another program that sparked an additional desire for learning. NAI offered SAT prep, math tutoring, and even science on Saturdays to help increase our desire for learning. I took full advantage of everything NAI had to offer.

Other life milestones Yvonne and Eduardo shared were their High School Graduation (below left: the two celebrating their graduation from Foshay Learning Center) and their first teaching experience with MSP, the two shared a classroom until this Spring 2020 semester when they each led their own (below right: Eduardo leads his MSP students in Ms. Robles’ class in a group activity).

Without JEP or NAI, my dreams of becoming a STEM professional would have never crossed my mind. Both of these programs introduced my young mind to different methods of learning and thinking. These methods eventually allowed me to continue my education at USC while also simultaneously giving back to both these programs so that the next generation of students can develop a desire for learning STEM.

After culminating from Weemes, I attended Foshay Learning Center from the 6th-12th grade. At the end of the 6th grade, I was offered admission to the Neighborhood Academic Initiative (NAI) program. I accepted the offer and officially started the NAI program in the 7th grade, a decision that to this day I am so glad I made. NAI provided an extra boost that I would need when I would one day attend college—specifically USC. I admit that I did struggle in my STEM classes, but NAI taught me to not give up and to reach out for help when I needed it. I wasn’t the only member of my family to attend Weemes. Since 1997, all six of my siblings have attended or are currently attending the school; my little sister is in the 3rd grade with Mr. Brennan. Weemes always offered as many learning experiences as they could and my siblings and I are fortunate enough to have experienced JEP. USC’s involvement with Weemes is the main reason why my mom decided to send my siblings and me to the school. From a personal level, I enjoyed having USC students come and work with my class when I was a little kid. I never understood why students would come to my school to work with me. But as I got older I understood that LAUSD didn’t have enough resources to immerse their students in a multitude of programs.

Through my own experiences and the experiences of my family and peers, I see the desire to learn from many students. I know that the students want more than LAUSD and their teachers can offer and I am lucky enough to be able to help fill that gap through JEP. I started in the Medical STEM Program (MSP) during the fall of my freshman year. I was finally behind the scenes, bringing more learning experiences to the students with my co-teacher, Yvonne Hernandez. We were there to support each other until we each had our own classrooms in the spring of 2020.

I loved being able to teach the students our MSP curriculum that encompasses both normal organ functions and what goes wrong in the context of cancer. MSP had the full attention and participation of the students. Every student loved being able to work with each other during hands-on activities. This is one of the reasons why I love and appreciate the JEP programs.

JEP allows students to take risks in their activities and it gets them out of their comfort zones. Even students who have no understanding of the English language are included in these activities. Being fluent in both English and Spanish allows me to work with students who recently migrated to the US from Latin America. I also love walking around the students and assuring them that I’m here to help them grow and gain an interest in STEM.

JEP’s STEM programs allow students to see what they like and don’t like. By teaching Mrs. Robles’s class, I potentially got some students thinking from a medical perspective. Who knows, maybe in 30 years these same students could be oncologists and finding the cure to cancer. JEP is a wonderful program that I am proud to be a part of. I know that JEP is a program that is intended for student growth and development because I partook in the program as an elementary student and I am now a freshman at USC studying human biology on a pre-med track.
MSP: New decade, new curriculum & new touch to cancer education

by Anupam Singh, Dieuwertje Kast, W. Martin Kast

Spring 2020 has seen the successful implementation of the Medical STEM Program (MSP) for three semesters. The USC Norris Comprehensive Cancer Center has been the pillar of financial support and helped to both implement and expand MSP tremendously. It all started in the spring of 2018 as a component of the USC Readers PLUS’ after-school Wonderkids program. In the Spring 2019 it expanded to a regular school day program, tailored to second graders. Having a more focused program has enabled us to teach cancer education in a much more effective manner. We were able to plan the year’s curriculum with a more cohesive set of lessons that gave continuity and context to teaching the science of cancer. This semester, the program has also progressed from providing students with background information on cancer to teaching them about skills and fields associated with cancer biology. Curriculum designers, Dieuwertje Kast and Surbhi Bansil, wrote the four units scheduled for teaching this semester. The topics included Laboratory Science, Dermatology, Pharmacology and Pulmonology. Each unit was associated with innovative pre and post assessment tests designed by Stephanie Davis, who is also a Teaching assistant (TA) with MSP. These assessments have been a great resource to track student learning.

The first unit presented this year was laboratory science. A big part of being a cancer researcher is spending a considerable amount of time in a scientific laboratory and performing experiments. Hence, lessons in this unit

A student in MSP looking through a microscope during our laboratory sciences unit. Students looked at slides of different cells to practice their microscropy!

MSP Students show off three of our activities from the past year. Left: Our activity that teaches the basics of stitches. Center: Our dermatology unit included this model of the different layers that make up skin. Right: Students learned about the information that goes on a prescription bottle by making their own to wear!
covered topics like measuring liquid volume, measuring mass, microscopy (the most loved equipment), and the use of microscopes during a lesson on colony counting. The students used sprinkles (representing bacterial cells) to form colonies on glue (the growth media).

The second unit --dermatology-- introduced students to the biology of human skin and what happens when this organ becomes cancerous. Through this unit we taught lessons on healthy versus unhealthy cells, skin injuries, effects of UV radiation and skin cancer. Students learned how skin forms a protective barrier that serves to “waterproof,” cushion and protect the deeper tissues, excretes waste, regulates temperature, and serves as the attachment site for nerves of sensory receptors. This is needed to detect pain, sensation, pressure, and temperature. We should all have so much appreciation for our skin!!

The pharmacology unit focused on teaching students about chemotherapy: the most common form of cancer treatment that involves prescription drugs that are given to cancer patients. Lessons were designed to teach second graders about prescriptions, including concepts relating to dosage, active ingredients and frequency. The next set of lessons included the creation of a first aid kit and gigantic prescription bottle costumes. At the end of the activity, students understood that prescription medicines should only be taken by the person whose name is imprinted on the prescription bottles.

The Pulmonology unit was slated to start mid-March, which was the week that the University started putting in proactive preventive protocols to combat the COVID-19 pandemic. MSP had to cancel its last unit and unfortunately the scientists speaking engagements were also cancelled due to COVID-19. As university’s teaching goes virtual, MSP has invested its remote work time in digitizing and filming all of the past MSP lessons to make them accessible to students.

MSP has been lucky to have an excited, motivated and innovative group of TAs, thank you for your hard work! And a big thank you to the teachers at our three MSP partner schools for helping in the ongoing implementation and increasing the effectiveness of MSP in their classrooms.
USC Young Scientists Program

The Young Scientists Program works in partnership with 7 USC community schools, from the greater ‘USC Family of Schools’ to engage more than 2400 elementary school students, 85 LAUSD teachers, and 7 principals through a broad repertoire of science curricula. YSP TAs are placed at each school presenting hands-on science labs to elementary school classrooms. YSP brings scientific laboratory experiences directly to students and their teachers with the goal of supplementing current science instruction, complementing LAUSD and state grade level science learning standards, strengthening science literacy and promoting interest in scientific careers.