Regional STEM Mentoring Program

NorCal STEM Education Foundation: Report for Summer Program 2017

THE PROGRAM

The NorCal STEM Education Foundation's Regional STEM Mentoring (RSM) Program aims to encourage and empower students to explore their interests in scientific, technological, engineering and mathematical (STEM) subjects through inquiry-based learning and exposure to real world issues.

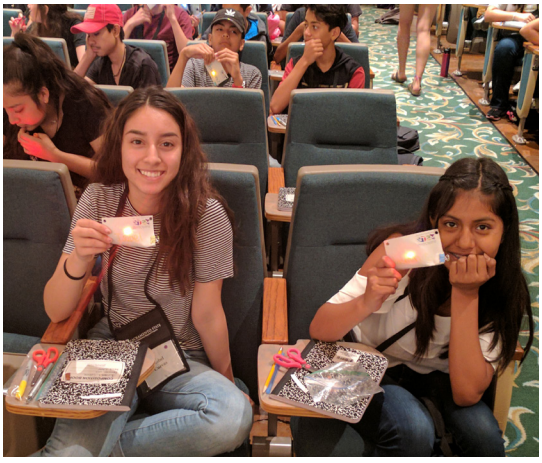
The NorCal STEM Education Foundation partnered with the California State University, Sacramento's College Assistance Migrant Program (CAMP) as part of their Migrant Student Leadership Institute. CAMP is a federally funded program designed to help students from migrant and seasonal farm worker backgrounds succeed at Sacramento State. CAMP facilitates transition from high school to college and offers first-year support services to develop the skills necessary to persist and graduate from college. CAMP strives to be "a home away from home" for its students.

PROGRAM OVERVIEW	
Number of students:	150
Total Mentoring Hours:	7 hours
Confidence in STEM areas:	Increase of 30%
Gender Split:	41% Male 59% Female
Latino	100%
Mentors in STEM areas:	Planetary Science, Applied Engineering, Computer Science, Behavioral Science, Physical Science, Biology & Health Sciences

THE PURPOSE

The Regional STEM Mentoring Program's overall purpose is to build a stronger, more prepared and diverse STEM workforce. The RSM Program focuses on exposing students from less affluent areas to STEM categories and resources to expand their view of possible careers. Important objectives of the RSM Program include helping students develop collaboration skills with peers and adults, and inspiring students to pursue STEM degrees. Partnering with CAMP through the Migrant Student Leadership Institute satisfied many of the goals of the RSM Program including those listed above. During its time with the Institute, the RSM Program introduced hands-on engaging activities in STEM, used trained STEM professional mentors to present career possibilities and performed the scientific process with every day materials to demystify the possibilities in STEM education for these students from migrant backgrounds.

The Migrant Student Leadership Institute is a week-long program that provides students with courses in college-level classes and encourages exploration of subject material to prepare these students for post-secondary education. The Insitute is an integrated program of study that met the following goals: 1) provide a challenging and rigorous program of study focusing on the application of STEM subjects; 2) bridge and connect in-school and out-of-school learning opportunities; 3) provide opportunities for student exploration of STEM related fields and careers; and 4) prepare students for successful post-secondary education.

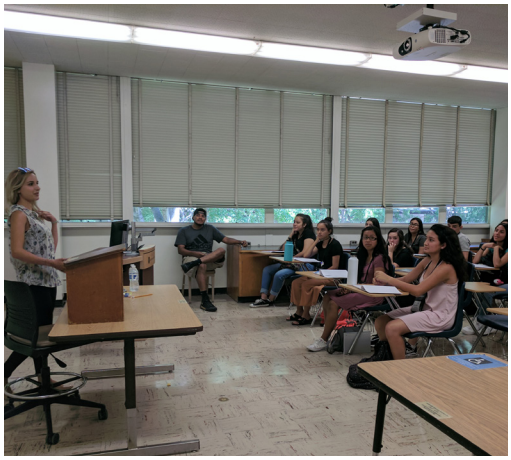


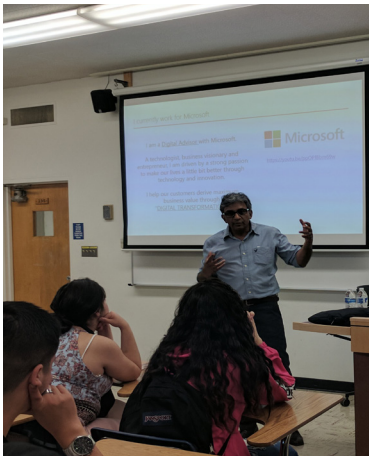
PHASE 1: INTRODUCTION

At the start of the Program, the students were given a pre-evaluation to get a better understanding of their prior knowledge and background regarding STEM. In the pre-evaluations it was found that only 6% of the students currently participate in STEM based programs. Whereas 66% of the students had listed a STEM subject as their favorite subject in school and 66% also reported they asipire to STEM careers. From the survey it was gathered that 2/3 of the students want to be involved with STEM; however, without the proper resources, their goals will remain unrealized.

I liked what the mentors talked about because their jobs were really interesting.

- RAUL, GRADE 10





After a short introduction and presentation on lab notebooks by the NorCal STEM Education Foundation Director, the students were given their first hands-on activity. The hands-on activity illustrated the some concepts of electric engineering by teaching the students to build a basic circuit to power an LED bulb. The LED bulb was inserted onto a nametag that the students made for themselves and the circuit was created using copper tape and a small battery. The students were elated when their circuit was closed and their nametag suddenly lit up. This activity opened the door for the rest of the program's activities.

PHASE 2: CAREERS

Six mentor sessions were arranged so that the students could learn more about what STEM careers are available, especially in the greater Sacramento area. The students learned about the profession of each of the mentors and what that meant for them on a day-to-day basis. The mentors were instructed to dress as if they were going to work - students were visibly surprised to see jeans and polo shirts. By breaking stereotypes, students can connect with and understand what STEM means in the real world. Each mentor spoke about their career pathway, educational background and current position and duties. To end each segment, the mentors performed a quick experiment, encouraging the students to help explain the science behind the outcome.

I learned a lot about what math can do for your future as a scientist.

- Cristina, Grade 11

PHASE 3: SCIENTIFIC PROCESS

The final segment of the Program included an interactive journey through the Scientific Process. The students were assigned a question surrounding an everyday action - snapping. The steps of the scientific process were split into seven round table activities. The students had to collaborate to develop their observations, research the topic, hypothesize, develop an experiment, perform the experiment and conclude. At the conclusion of this activity, the students were able to move through the scientific process easily.

PHASE 4: THE RESULTS

The students were provided with post-evaluation surveys to complete the program. The results show a 1 point change on a scale of 1 to 5 in regards to feeling confident enough to propose a hypothesis of their own creation after participating in the one-day program. Other questions produced interesting results. For example, the question "What category of science, technology, or engineering are you most interested in?" produced the following results: 1% Behavioral and Social Science; 1.5% Chemistry; 3% Physical Science and Math; 9% Biology and Health Sciences; 16% Computer Software and Technology; 17% Applied Engineering and 27% General Science.

Finally, 18% of the participating students stated they planned on joining next years' Sacramento Regional STEM Fair. This shows an increase from the 4% who reported they attended in the pre-evaluation survey. The results illustrate the interest from students to engage more with STEM.

IMPACT

The results of the Program are clear. While students may have a positive outlook on STEM, their ability to achieve in STEM will rely on resources available to them. Many students wrote that they want to be more invovled but they lack the resources to do so.

THE FUTURE

The Foundation will follow up with these students, their parents and teachers to see if those resources can be provided to these students to ensure a continued interest in STEM subjects.