Abstract

Brooklyn College Fellows are working in five different high schools in Brooklyn, New York. While the ongoing projects at each of these schools are unique, they emphasize the communication of science, technology and mark students' skills to high schools students in the urban environment. In general, the projects utilize a "city-as-lab" focus, whereby projects are designed to help students better minds to think scientifically about issues of interest. Each group of Fellows and teachers aid their students in identifying empirical research questions and designing experimental approaches to address these issues. Students then work towards the collection, representation and analysis of data. The communication of student work is also of great importance to our program, as past groups have given oral presentations to their fellow classmates and community. For instance, our groups in Brownsville and East Flatbush study air quality by examining asthma rates and estimating the levels of NOx, CO, CO2, SO2, and particulate matter. Presentation of this research promotes public awareness of the school communities. Students in Flatbush track nutrient loading into an urban fresh-water lake using a relational database and GIS technology. Working in small groups, students collect and test water samples. Then, as a class, they analyze and interpret the data. A living environment class in East Flatbush is investigating focused sources which adds to the knowledge on possible causes of the high rates of asthma. In Bushwick, the students are becoming tree stewards by adopting trees in their neighborhood. They study the health of the trees and present their findings by creating interactive online maps of their data. With mentors around the city, Prospect Heights students are working on research skills and developing projects such as investigating factors affecting the intensity of Atlantic basin hurricanes and soil characteristics associated with the migration of invasive plants.

Benefits to Fellows

The "City as Lab" project at Brooklyn College has benefitted the Fellows in all of the areas of our project's goals: improvement in communication skills, applications of effective STEM pedagogy, increased proficiency in leadership and team building, and mastery of various forms of technology. For example, in the area of communication, Fellows have developed posters and oral presentations on the project and in the development of educational materials to be used in the classroom. They have also modified and created unique materials including posters, websites, and brochures designed to engage students in the project. All members of the Fellows group have worked on a project, either the writing of fellow proposals or the writing of fellow reports. In the area of effective STEM pedagogy, the Fellows have learned the importance of integrating research presentations and instruction in the New York City schools. The Fellows have worked side by side on projects for the benefit of students and teachers and staff with high school students, leading a teaching role in the STEM activities that the project is introducing to our partner school. In some cases, the Fellows have also performed with community organizations to expand the impact of the project more broadly. Fellows have also improved their mentoring skills by helping younger students with high school-level assignments.

Project Summary (School Level):

Teachers Preparatory School in Brownsville, Brooklyn is dedicated that Teachers Preparatory School has taken part in the Brooklyn College NSF-GK12 program. All materials purchased as well as lab and course plans designed through the GK12 program are dedicated to the students of Teachers Preparatory School and are used throughout the year. This year, the GK12 Fellows introduced technologies such as GPS and GIS that were used by students to map data for a Prospect Park greenhouse study and on a part of a forest in forensic science, where students created crime maps for their local schools and asked and analyzed patterns of violence based on NYPD statistics. The junior and senior years of the research program focus on developing their closest study through in class research skills training and after-school mentorship. Along with BIBF staff, Fellows are working to map the growth trends of several invasive plant species found in the 519-State area and explore factors affecting the intensity of Atlantic basin hurricanes.

Science, Technology and Research HS (STAR)

Students in Living Environment and Chemistry classes are conducting experiments measuring nutrient loading into Stripe Lake. As part of a long-term study, science class are sampling and mapping lead concentrations in the water throughout Brooklyn. In the spring, these students will also be working on a geospatial survey of the tree health in the parks, as well as other invasive species. GIS technology is incorporated into all of these activities.

Brooklyn College is the City University of New York is the home base for the "City As Lab" project. Many of the SCA Fellows teach and conduct research on campus, and college facilities including advanced computer labs are available to the participating schools.

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Support provided by: NSF Graduate Teaching Fellows in K-12 Education 0638718