



CAUSE (College Achievement through Urban Science Exploration)

Abstract

Following a successful partnership with Henry Street Settlement (HSS) on a CYFAR project entitled Community Improvement Through Youth (CITY), Cornell University Cooperative Extension-NYC (CUCE-NYC) was invited to collaborate on the CAUSE project. HSS and CUCE-NYC successfully submitted and received funding to implement the project, selecting its first cohort of students in 2009. CAUSE's purpose is to increase teens' knowledge, interest and attitudes towards science, the environment, and community engagement.

Each CAUSE student was given the task of designing individualized research projects. Provided with hands-on advising, students were able to delve into their research questions to develop their research projects and present substantial findings. The students also received intensive college preparatory services through the Princeton Review SAT prep course, college counseling, assistance with the application and 4-H workshop sessions on public presentations and interviewing.

The program highlight came in summer 2010 as students attended the Cornell Summer College program and completed a rigorous environmental science curriculum for three college credits. Cornell University professors and graduate students also mentored them on their projects. Students presented their final research projects to an audience of their peers, advisors, parents and sponsors. The students' impressive research covered topics affecting the communities in which they live, including Metrocard and fast food restaurant recycling, eco fashion and water conservation.

Program Needs

Under representation of minorities in the Science and Engineering workforce continues to be a problem. New strategies are needed to strengthen students' science skills, interest in science and awareness of potential related careers.

Targeted Audience

Partnering with Henry Street Settlement, students were selected from low-income communities on a competitive basis based on a lengthy application process. Students were asked to demonstrate their interest in science education and their desire to incorporate science related interests into their future college plans. Seven students were selected to participate in the first program year. Parents and family members were included in the target audience and throughout the program.

Program Goals and Objectives

The long-term goal of the College Achievement through Urban Science Education (CAUSE) project is to increase the number of minority youth pursuing and succeeding in science and technology college majors and careers.

Jackie Davis-Manigaulte



Senior Extension Associate

Cornell University
New York, NY
jad23@cornell.edu



To achieve this goal, CAUSE seeks to improve the college readiness skills of minority youth from low-income communities by combining environmental studies, research, field study, and community service with intensive college preparatory services. The faculty and field based staff involved in designing the CAUSE model wish to explore whether this approach, accompanied with greater college preparation, will increase the possibility of youth pursuing science and technology studies and careers. Two other potential outcomes of the program are changes in attitudes toward science in general, and toward the environment, including awareness and behaviors.

Program Design/Curricula and Materials

The program is designed to encourage high school juniors to explore science as a career track in emerging areas such as “green” technologies, ecology, and environmental studies; and prepare them for the rigors of college and scientific research. Students design a research project based on their research and study. The program also includes a three-week residential college experience at Cornell University during the summer and culminates with a fall presentation of research project findings to parents and family members, peers, community members and sponsors.

Over the course of twelve months, the program offers:

1. An “Exploratory Phase” in the fall semester where students learn about research methods and ideas related to environmental studies and pick a topic of interest;
2. A Student Research Project in the spring that builds on the interests developed during the “exploratory” phase;
3. A three-week residential college experience at Cornell University during the summer through the Cornell University Summer College program, followed by fall research project presentations to parents and family, peers, community members and sponsors;
4. College preparatory services (provided by Princeton Review) interwoven throughout the program year to increase students’ prospects for achieving academic success, guide them through the admission process, and help them gain acceptance to top colleges and universities; and
5. Follow-up services to maintain contact with students beyond college admission in order to support student retention and their connection to CAUSE.

Knowledge and Research Base

The 2009 National Assessment of Educational Progress report of national science scores revealed that “fewer than one-third of elementary and high school students have a solid grasp of science.” The Program for International Student Assessment indicated that U.S. students trailed students in Hong Kong and Shanghai on an international science test (Banchero, 2011). These findings help provide justification for the science education approach that was taken in the CAUSE project.

In addition, the American Society for Quality (ASQ), commissioned the market research firm Harris Interactive, to conduct an online survey to uncover how well teachers transfer their knowledge and passion for science and math to their students and inspire them to pursue STEM careers (Stansbury, 2010). The survey of more than a thousand students in grades 3-12 was conducted in December 2010, and found that “Although 85% of students





said their teachers deserve at least a “B” when it comes to knowledge about science topics (55% of students gave their teachers an “A”), 63% of high school students said their teachers are not doing a good job of talking to them about engineering careers (“C” or lower), and 42% of high school students said their teachers don’t ably demonstrate how science can be used in a career (“C” or lower). The study goes on to state that in some cases, a contributing factor is that some teachers aren’t doing all they can to connect the dots between the math and science work that students are doing on a daily basis and how it relates to the real world and their future careers.

These studies highlight the issues that the CAUSE project is attempting to address through its project design. The project is designed to provide youth with a rigorous and stimulating science education experience driven by student interests and course requirements locally and at Cornell University.

Partners

- Cornell University Cooperative Extension - NYC
- Henry Street Settlement
- Teagle Foundation
- Cornell University – College of College of Agriculture & Life Sciences – Department of Natural Resources
- Cornell Summer College

Funding

Teagle Foundation – College- Community Partnerships Initiative

Staffing

- Ritu Sen, Henry Street Settlement – Director of Educational Services, On-site Project Leader (1st cohort)
- Matt Phifer, Henry Street Settlement – Counselor, Director of Adolescent Services (1st cohort); Director of Educational Services, On-site Project Leader (2nd cohort)
- Greg Rideout, Henry Street Settlement – Director of Youth Development at Henry Street Settlement
- Abby Eller, Cornell University Summer College – Director for Summer Programs
- Marianne Krasny, Cornell University – Chair and Faculty Advisor, Department of Natural Resources; Project Principal Investigator
- Jackie Davis-Manigaulte, CUCE – NYC; Sr. Ext. Associate/Family & Youth Development Program Leader – Co-Principal Investigator and Overall Project Coordinator
- Lucinda Randolph-Benjamin – CUCE-NYC; Extension Associate/4-H Program Coordinator – coordinates 4-H public speaking & interview workshops
- Jason Corwin, Cornell University Graduate Student Consultant – supports students during three-week course at Cornell University

- Alex Kudryavtsev, Cornell University Graduate Student Consultant – conducted weekly sessions (1st cohort) and developed curriculum
- Umang Desai – CAUSE Instructor (2nd cohort)

Program Delivery

Students met for 36 after-school sessions at the Henry Street Settlement throughout the program's duration. Meeting with their program's mentors, youth explored the various science topics, as well as key 4-H concepts such as public presentations and leadership. Students split their working time between group sessions, college preparations and conducting research for their individual projects. In summer 2010, students attended a three-week summer college experience at Cornell University, taking a course on environmental studies and being mentored by a Cornell graduate student. Following the summer college, students presented their year's work and research findings at a final symposium.

Recognition of Participants

Students were recognized upon completion of the three-week course at Cornell University and then at a closing ceremony in the fall of 2010, during which each student presented their research project findings. In addition, Dr. Krasny held an informal reception at her home for the students during their stay at Cornell University, which was particularly meaningful to the youth.

Program Evaluation and Outcomes/Impact

The program had a great impact on the participants and their personal and academic growth. Thirty-six afterschool sessions introduced the youth to environmental studies and research methods during which they embarked on their own research projects on topics such as water conservation, eco-fashion, Metrocard recycling, recycling in the fast food industry and environmental education. In this process, youth increased their writing, math, analytical, research and networking skills and formed friendships that will be the foundation of an alumni group to support them during their transition to college. A three-week summer college experience at Cornell University has been particularly rewarding, as participants became fully immersed in campus life and were introduced to college-level course work. The students have also become passionate ambassadors for environmental causes as a result of their research into the interrelations between local and global ecological phenomena.

The project is funded for three years. Students in the second year of the CAUSE program are designing their research projects and applying for the Cornell Summer College Program. The first year CAUSE alumni are eager to stay on board, continuing to work on their research and serving as mentors to the new CAUSE cohorts.

The CAUSE Project as a whole has been a great experience. It has been both fun and challenging at times. I have learned a lot from both Alex and Ritu and I am sure next year's participants will learn just as much. The CAUSE project has helped me increase my knowledge about the environment, through Alex and the Cornell course. It actually helped me realize how much of an interest I had in environmental studies. My research project also helped me learn more. I had a chance to sharpen my report writing skills with the help of Alex. The CAUSE Project also helped me make new friends who will now be in my life for a very long time.





Cornell University Summer College, the other aspect of CAUSE (the first being research projects), was really fun even though it was difficult. The class taught me a lot about the history behind environmental studies. It taught me about some things I already knew and about completely new things. Summer College really showed me what it would be like living in a dorm and on a college campus. I think I am much more prepared for college than I was before. Tiquasha, 2009-2010 CAUSE Program Participant

– Tiquasha, 2009-2010 CAUSE Program Participant

Considerations for Replication

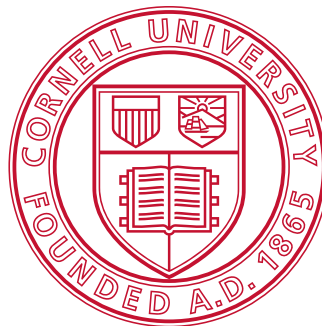
The program planners hope to create a model that will be considered for expansion and replication. We believe that CAUSE may serve as a model for other urban programs and, if so, we may consider eventually publishing the results of this project.

References

Banchero, S. (2011). Students score poorly on science test. Retrieved from <http://online.wsj.com/article/SB10001424052748704698004576103940087329966.html>.

Stansbury, M. (2010). Survey: Educators aren't discussing STEM careers with students. Available online at <http://www.eschoolnews.com/2010/02/25/educators-not-discussing-stem-careers/>

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