Lessons Learned from
10 Years of Changing the Face of Science
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New Study Validates Project Exploration’s Youth-Science Education Model

A 10-year study of the impact of Project Exploration’s programs on 1,000 young peoples’ lives tells us that our personalized, out-of-school time (OST) model for urban teenagers plays a central role in their education and career decisions. Graduates of Project Exploration programs get – and stay – involved with science, graduate in impressive numbers from high school and college, and pursue professions in science, engineering and math. For us, however, the most important lesson from this research is that OST science programs, which put youth at the center of high-caliber science experiences alongside scientists, can fundamentally change access to wider academic and economic opportunities for entire communities of students who are usually written off by traditional science education strategies.

BACKGROUND

Since 1999, we have seen how Project Exploration’s personalized out-of-school time programs in science can have a significant, long-lasting impact on our students. For years our alumni have provided us with powerful and humbling testimonials about life-changing experiences they’ve had while working alongside scientists here in Chicago and on expeditions in the Western United States. We focus on students traditionally overlooked by science education: 85% of students participating in PE come from low-income families, primarily African-American and Latino, and 74% are girls. We particularly target students who may not be academically successful, and we have received recognition locally and nationally for our work to level the playing field in science: in 2009 we received the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring, and in 2010 we were named a national model by the President’s Council of Advisors on Science and Technology.

But we wanted to go beyond anecdotes to better understand the long term, cumulative impact of our youth-science model over the past decade, and also learn what we could about the importance of OST science programs on young peoples’ lives.

KEY FINDINGS FROM THE RESEARCH STUDY

With support from the Noyce Foundation, we commissioned a 10-year retrospective study of our alumni from the Center for Research, Evaluation and Assessment (REA) at the Lawrence Hall of Science, University of California, Berkeley. Following the REA study, we sought responses from the Urban Education Institute at the University of Chicago and from Harvard’s Program in Education, Afterschool and Resilience to better understand the local and national implications of the research. The findings in “Project Exploration: 10-Year Retrospective Program Evaluation: Summative Report,” by Bernadette Chi and her colleagues at REA are gratifying and thought-provoking.

Data from the report underlines the link between meaningful experiences in science, technology, engineering and math – known as ‘STEM’ learning – and the pursuit of science careers. The value of Project Exploration programs extends beyond simply exposing students to new ways of understanding science – as important as that is. In fact, the Project Exploration “youth-science” model keeps students involved with science long after they finish programs. The study notes that among students and alumni:

- 95% have graduated high school or are on track to graduate, nearly double the overall rate of Chicago Public Schools;
- 60% of students enrolled in a four-year college are pursuing degrees in STEM-related fields;
- 60% of students who graduated college graduated with a degree in a STEM-related field.
Equally important, researchers found that Project Exploration’s distinctive “youth-science” approach plays a central role in students’ development as young adults, increasing self-confidence, and verbal, writing and leadership skills.

Yet, the most significant finding is this: out-of-school time science programs, which provide students with a youth-centered learning environment, connect students with practicing scientists and support long-term relationships with adults, have a measurable impact. The model has demonstrably created access to wider opportunities for entire communities of students who are usually written off by traditional science education approaches.

LESSONS LEARNED

The Center for Research, Evaluation and Assessment (REA) study investigated two questions:

• What was Project Exploration’s influence on past participants?
• What are the organizational practices that support science learning for traditionally under-represented students in science?

Science in School and Work

Through an extensive survey of alumni 18 years and older and follow up interviews, researchers found Project Exploration’s programs – from exploring engineering to digging for fossils to training as lab interns – boosted student interest in science and opened new academic and economic horizons.

Researchers found in Project Exploration’s youth-science program design “three major dimensions – increased science capacity, positive youth development, and engagement in a community of practice” that have rendered a powerful effect upon participating students.

• 88% said Project Exploration introduced them to STEM career options they had not previously considered;
• 32% of those surveyed held science-related employment.

For Project Exploration, the results suggest that we are achieving our goals of getting students interested in science, keeping them interested, and equipping them with what they need to pursue science.

Community and Possibility

Researchers noted that what is most distinctive about Project Exploration is our ability to build a community of practice and a sense of “family.” By putting students’ interests at the center of our programs and nurturing “highly personal relationships,” Project Exploration equips students with an array of life skills – writing, speaking, leadership and teamwork – that are essential throughout their high school careers and far beyond.

• 83% of alumni said they felt part of a “special community;”
• 95% said they agreed or strongly agreed that “adults showed an interest in my academic success,” enabling students to discuss and explore new educational and career opportunities;
• 91% agreed or strongly agreed that Project Exploration had increased their self-confidence – and 89% felt better about their futures because of their experiences.

FINDINGS IN CONTEXT

As we raise our heads from the day-to-day work of building youth-science programs here in Chicago, we see nationally that two-thirds of the achievement gap between lower- and higher-income youth can be explained by unequal access to summer learning opportunities. Science in school is necessary, but not sufficient for engaging and supporting students’ involvement in science. Wide gaps between the scores of white and minority students, poor and more affluent students, and boys and girls in science and math tests in grades four, eight and twelve remain entrenched. This shouldn’t be the case.

As part of our report, Gil G. Noam, director of the Program in Education, Afterschool and Resilience at Harvard, reviewed the REA study. Calling Project Exploration “pioneers” in OST science programs, Noam singled out our focus on personal connections between students, mentors and scientists. “The overwhelming number of students state the relationships really mattered,” he observed. “They understand that Project Exploration is not just about science and STEM careers, or about activities in OST. They appreciate the quality of the relationships between staff and students.”
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We commissioned a second response to the REA report from Sara Ray Stoelinga, senior director of the University of Chicago’s Urban Education Institute. Stoelinga observed Project Exploration “has the potential to fill a great need in increasing engagement in science and scientific knowledge among Chicago Public School students.” More broadly, her response notes that Project Exploration “is building social capital” – or a community of relationships – that is “critical to the success of disadvantaged children focused on learning and engagement in science.”

FACING THE FUTURE

At Project Exploration, over the next few years we will double, to 500, the number of students that are engaged each year in our intensive youth-science programs, and we will continue to support our alumni. We will establish an institute with the goal of making our approach available to others who want to share in this work. And, we will build a Youth Science Center that will offer a national demonstration and learning site for exploring what getting and keeping students engaged in science – along-side scientists – can look like.

We founded our work by asking big questions:

• What does it take to recruit and retain students least likely to get involved with science?
• How can science positively change the lives of underserved minority populations, especially girls?
• What impact can out-of-school-time science programs have on the educational and career aspirations of under-represented Chicago middle and high-school students?
• What happens when students are brought together with practicing scientists to work on real, hands-on projects?

At a time when the U.S. is falling behind global competitors in science and math, can accessible, highly-personalized out-of-school-time programs offer part of the solution to closing the gap?

Now, with the results of the research report in hand, we must ask a new question: How can Project Exploration’s proven model be shared locally and nationally? We believe education in the 21st century must provide access to experts, high-caliber, compelling content and individualized learning guided by caring adults. Project Exploration’s youth-science model demonstrates what 21st century learning can look like for those students at highest risk of being left behind. This 10-year study tells us science really is for everyone. Stirring young peoples’ sense of wonder and curiosity – by equipping them over the long haul to pursue their questions and find community – can help change the course of their lives and, ultimately, change the face of science.

Gabrielle Lyon
Cofounder and Executive Director

“I would say they differ from other outreach, inner-city and minority (programs) that I have been a part of in the sense that they really have this sense of continuity with their students. They do a good job at trying to contact people if they’re losing touch with them. They’ll make phone calls and send e-mails so they can give them more of a sense, like, you know, ‘It’s more than just one thing you did that summer,’ it’s something you continue to do.”

“I always loved science but everyone there really made it fun and interesting for me to learn. They have all been so welcoming and just are such a great group of people that I would always want around. They are a GIANT extended family. I LOOOOOOOOVE my Project Exploration family. Every issue I have ever put in front of PE has been solved and I feel at home.”
Read the full report or download publications cited in this summary at www.projectexploration.org/10years

