



FY2024

RESEARCH AND EVALUATION IN URBAN ADVANTAGE

UA Research & Evaluation Team: Anna MacPherson,
Karen Hammerness, Jamie Wallace, Hudson Roditi,
Colleen Owen, Lauren Tecosky, Linda Curtis-Bey & Meryle
Weinstein

TABLE OF CONTENTS

03 Program description and UA by the numbers

05 What features of UA are supported by research?

06 How does UA impact teachers?

07 How does UA impact students?

08 How does the impact of the program compare to similar, large-scale PD programs?

09 How does UA's impact on student learning compare to similar programs?

10 Acknowledgements, where to find research, contact information



PROGRAM DESCRIPTION

High quality
professional
learning for
teachers,
administrators, and
parent coordinators

Classroom
teaching
resources,
materials, and
equipment

Evaluation of
program
goals and
student
learning

Six research-based components

Capacity
building and
sustainability
structures

Access to UA
partner
institutions

Outreach
through
family events,
and annual
Science Expo

UA Middle Grades by the Numbers

83,500

NYC students in grades 6, 7 and 8 have an Urban Advantage Teacher

835

Middle school teachers participated in Urban Advantage in FY24

254

Middle schools across all 51 City Council Districts and across 5 boroughs are enrolled, which represents

46%

of all NYC middle schools

UA middle school students reflect the diversity of the NYC Public Schools

Student demographics (%)	UA	Citywide
Female	48.6	48.7
Black	20.1	24.4
Hispanic	42.6	41.1
Asian	19.9	16.6
White	14.9	14.7
Multiple Race or Other	2.3	2.7
Economic Need Index	75.8	70.5
English Language Learner	15.1	13.9
Students with Disabilities	22.1	21.2

Percentages are based on 2021-2022 UA and NYCPS enrollment numbers. Percentages do not add up to 100% due to missing demographic information.

UA Elementary Grades by the Numbers

9,450

NYC students in grades 3, 4 and 5 have an Urban Advantage Teacher

135

Elementary school teachers participate in Urban Advantage

57

Elementary schools are enrolled

7

UA Elementary Lead Teachers

UA elementary students reflect the diversity of the NYC Public Schools

Student demographics (%)	UA	Citywide
Female	47.7	48.7
Black	19.9	24.4
Hispanic	40.2	41.1
Asian	19.5	16.6
White	16.4	14.7
Multiple Race or Other	3.9	2.7
Economic Need Index	75.6	70.5
English Language Learner	18.6	13.9
Students with Disabilities	25.4	21.2

Percentages are based on 2021-2022 UA and NYCPS enrollment numbers. Percentages do not add up to 100% due to missing demographic information.

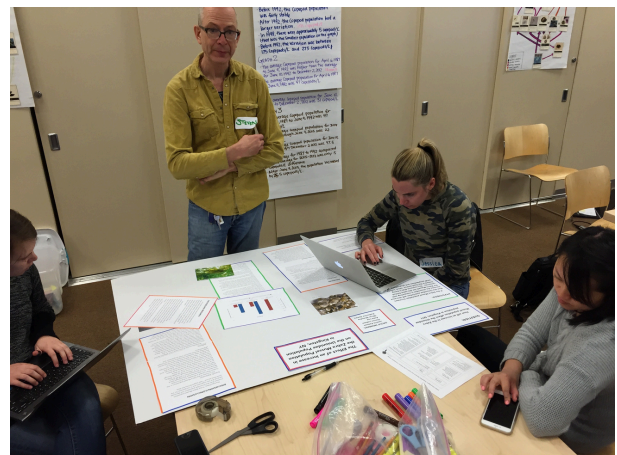
What features of Urban Advantage are supported by research on high quality teacher professional development?

Urban Advantage is a **long-term** professional learning experience; even veteran teachers can learn and grow in Urban Advantage. Teachers can participate in Urban Advantage for five years and then they have the option to join the Alumni or Fellows programs. Programs that take into account the changing needs and interests of teachers over time are reflective of the important understanding that teachers can and should continue to learn even as they grow in mastery and expertise. This reflects an appreciation for the value of lifelong learning for teachers and for what scholars call “teaching as a learning profession” (Darling-Hammond & Sykes, 1999).

To do so, Urban Advantage provides teachers with **many hours of professional learning** across several years; it is not a one-day workshop model. Research has underscored that

one-shot workshops for teachers are rarely an effective means of helping teachers learn, especially to change or strengthen their practice, even though many teachers continue to be asked to participate in them and schools continue to offer them.

Urban Advantage is focused on **specific scientific content and science teaching practices**. This is especially important because the most powerful professional development programs that have the most impact are those that are focused squarely upon content and practice of teaching and that identify specific instructional practices that teachers can bring back to the classroom (NAS, 2015). Furthermore, UA courses often focus teachers on **examining student thinking** — a feature that some studies have shown has an impact not only on teacher knowledge but also student learning (Wilson, 2013).



How does Urban Advantage impact teachers?



UA has been shown to support important **shifts in teaching around facilitating students' science investigations**. A qualitative study of UA teachers' classroom practice found that they **used tools from the UA professional development to support students in carrying out science and engineering practices**, such as writing and investigation scaffolds (MacPherson et al., 2019).

Furthermore, **UA participation increases teacher retention**. UA science teachers are, on average, **3.8 percentage points more likely than non-UA science teachers to remain teaching at their school the following year**. This impact is substantially higher for teachers with **3-5 years of teaching experience** (16 percentage points) (Shiferaw et al., 2023).

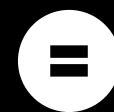


A shift toward NGSS-aligned practice, and a stronger likelihood that science teachers will stay in the profession, means that **UA is improving and strengthening the science teaching force in NYC**.

Can we put a dollar amount on that?

In terms of science teacher retention, it costs approximately \$21,000 to replace a teacher if they choose to leave the system (Garcia & Weiss, 2019). Participating in UA increases a teacher's likelihood to stay by about 4%. The program serves about 900 teachers per year, so that's about 35 teachers per year that are more likely to stay, saving the city \$735,000 it would cost to replace them.

35 teachers in UA per year are more likely to stay



\$735,000 (cost of replacing the teachers)



Does Urban Advantage improve students' performance in science?

Yes. Impact evaluations of the program show that **students that had teachers that participated in Urban Advantage scored higher on the NYS Intermediate Level Science test** (given in 8th grade) than students who did not participate in the program.

In fact, studies *from 2010 to the present* have documented a **positive effect of participation in the program on performance on state science test scores** (Weinstein et al., 2010, 2014, 2023).

How can we think about the impact on student learning in practical terms?

Because of UA, about 127 more UA students per year achieve “proficient” on the ILS exam.

How does the impact of the program compare to similar, large-scale PD programs?

This is a tough question to answer since so few similar programs conduct rigorous research on student learning. Districts and schools routinely engage professional development programs to provide opportunities for teachers to learn. However, **very few can offer evidence of the effectiveness of their programs, or their impact on teacher and student learning.** Reviews of studies of science professional development programs find most of the research on professional development in general is based upon correlational studies or teachers' self-reports (Wilson et al., 2017). These types of studies do not allow researchers to find *causal estimate*.

The Urban Advantage program stands out as a professional development program that has an enduring **record of research that has demonstrated positive impacts from 2010 through to the present. Impacts include**

- **Teacher retention at the school and district levels** (Shiferaw et al., 2023)
- **Improvements in teachers' inquiry-based science teaching practices** (MacPherson et al., 2019)
- **Student gains on a standardized test of science achievement** (Weinstein et al., 2010, 2014, 2023).

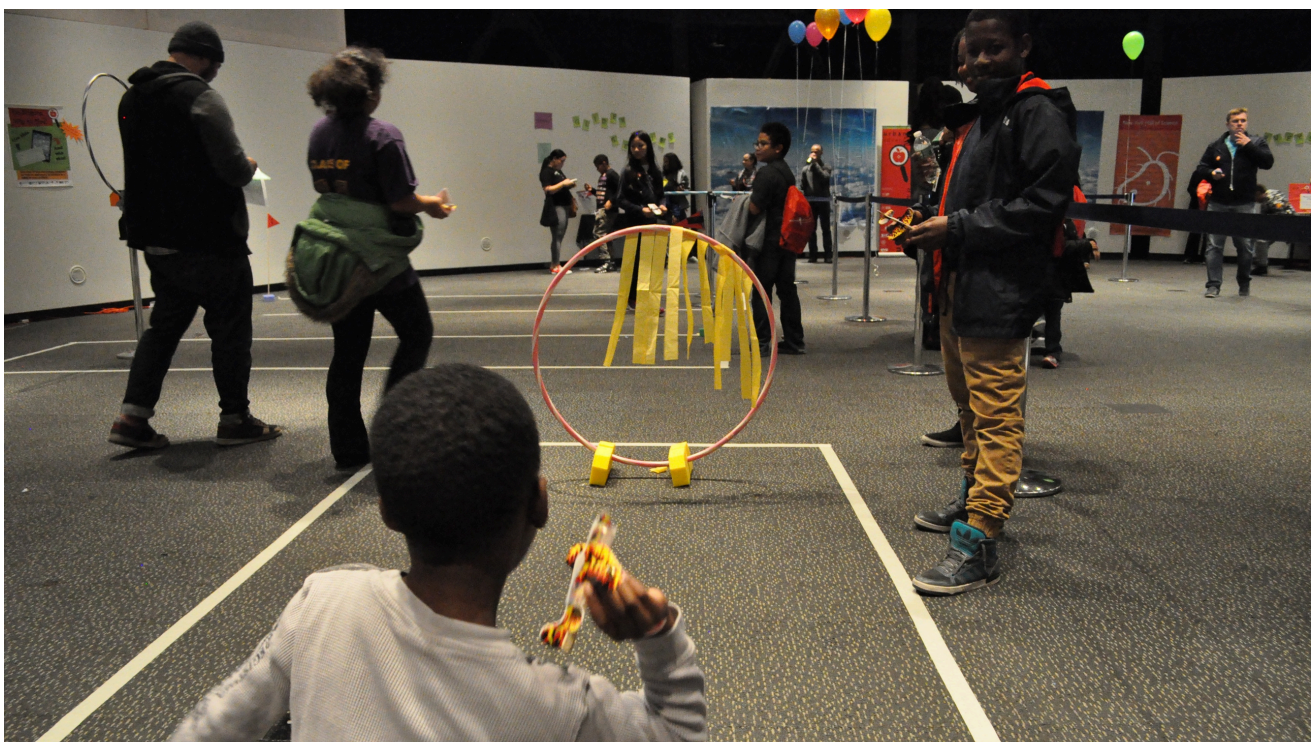
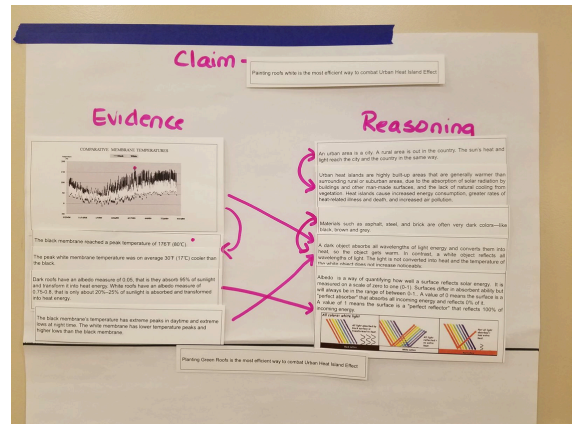
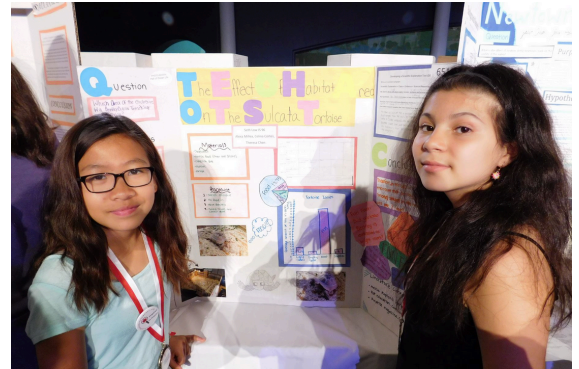
Furthermore, these impacts have been documented in the largest school district in the country.



How does Urban Advantage's impact on student learning compare to similar programs?

Compared to similar large-scale, science-focused PD programs, Urban Advantage has a similar effect on student learning gains. For example, a 2015 study of a science teacher PD program (Taylor et al., 2015) found an effect size of approximately 0.09 standard deviations, compared to UA's most recent published effect size of 0.08 standard deviations.

This PD program was slightly different in that it was curriculum-based (so teachers all used a standard curriculum in the classroom), which is not the case with Urban Advantage. We would expect a curriculum-based program to have a larger effect size (it is a more dramatic intervention); however, **UA's effect size was comparable, revealing that the tools, strategies and practices teachers learn in the program can have strong impact on student learning outcomes across varied curricula.**



ACKNOWLEDGEMENTS

Public support for the Urban Advantage program is provided by the New York City
Public Schools

WHERE CAN I FIND THIS RESEARCH?

[This page](#) has links to the papers and a summary of their findings. Also,
check out the research and publications page on the [UA website](#).

STAY CONNECTED WITH US!

www.urbanadvantagenyc.org

www.amnh.org/learn-teach/urban-advantage

Follow us! @ua_nyc #urbanadvantage



REFERENCES

- Darling-Hammond, L., & Sykes, G. (1999). *Teaching as the learning profession: Handbook of policy and practice*. Jossey-Bass Education Series. San Francisco, CA: Jossey-Bass Inc., Publishers.
- Garcia, E. & Weiss, E. (2019). *The teacher shortage is real, large and growing, and worse than we thought*. Washington, DC: Economic Policy Institute.
- MacPherson, A., Hammerness, K., & Chavez-Reilly, M. (2019). Professional learning in Urban Advantage and the development of core science teaching practices. Paper presented at the Annual Meeting of the National Association of Research in Science Teaching (NARST).
- National Academies of Sciences, Engineering, and Medicine (NAS). (2015). *Science teachers' learning: Enhancing opportunities, creating supportive contexts*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/21836>.
- Shiferaw, M., O'Hagan, K. and Weinstein, M. (2023) Staying Put: Positive Spillovers on Teacher Retention from a Middle School Science Initiative (August 16, 2023). Available at SSRN: <https://ssrn.com/abstract=4542675>
- Taylor, J. A., Getty, S. R., Kowalski, S. M., Wilson, C. D., Carlson, J., & Van Scotter, P. (2015). An efficacy trial of research-based curriculum materials with curriculum-based professional development. *American Educational Research Journal*, 52(5), 984-1017.
- Weinstein, M., Debraggio, E., Schwartz, A.E., Leos-Urbel, J., Nasar, L. (2010). Urban Advantage interim report. Institute for Education and Social Policy Working Paper. New York University.
- Weinstein, M., Whitesell, E.R., Leardo, M. (2014). Successful schools: How school-level factors influence success with Urban Advantage. New York University.
- Weinstein, M., Shiferaw, M. and O'Hagan, K. (2023). The Urban Advantage: Comprehensive Science Professional Development and Student Achievement (August 16, 2023). Available at SSRN: <https://ssrn.com/abstract=4542675>
- Wilson, S. M. (2013). Professional development for science teachers. *Science*, 340(6130), 310-313.
- Suggested citation: MacPherson, A., Hammerness, K., Wallace, J., Roditi, H., Owen, C., Tecosky, L., Curtis-Bey, L. & Weinstein, M. (2024). Research and Evaluation in the Urban Advantage Program. Research Brief #17. New York, NY: American Museum of Natural History. <https://doi.org/10.XXX/edu.rn.9>