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research study outcomes

What is Urban Advantage Metro Denver?

Urban Advantage Metro Denver (UA Metro Denver) is a partnership between Metro-area public school districts and science-based cultural institutions designed to improve science literacy among middle school students, focused on 7th grade students. The vision for UA Metro Denver is that all participating students become critical thinkers by actively engaging in authentic and meaningful science investigations. The program provides teachers, students and families with resources and opportunities to do, think and explore like scientists—both in and out of the classroom.

What is the Research Study?

In 2010, UA Metro Denver was awarded a National Science Foundation (NSF) Discovery K-12 Research Program grant, which funded an efficacy study to determine the impacts of the program on the target audiences: teachers, students and families.

How was the Research Study conducted?

To measure the program outcomes of interest, teachers, students and families completed surveys in the fall and spring of the 2014-2015 school year, while classrooms were observed in the winter. These surveys and observations were undertaken both in classrooms that participated in UA and in classrooms that did not. When available, statewide standardized science test scores will also be examined in the future.

What types of comparisons were made for the Research Study?

Three types of comparisons were made.

- 1) Teachers returning to UA who had been involved in the program previously, teachers new to UA, and nonUA teachers: It was expected that teachers returning to UA would have higher levels of the outcomes of interest to start the school year than new UA or nonUA teachers.
- 2) UA and nonUA: The impact of the program was examined by observing whether UA teachers, students and families experienced better outcomes than non-UA teachers, students and families.
- 3) More or less exposure to UA: The correlation of the outcomes of interest were examined by the level of teacher involvement in UA (as measured by participation in professional development, scheduling field trip outings and family science nights, and encouraging pass use by students).



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Legend

- Not statistically different ($p > 0.10$)
- + Borderline significantly higher ($p < 0.10$)
- + Statistically significantly higher ($p < 0.05$)
- Statistically significantly lower ($p < 0.05$)
- Not statistically correlated ($p > 0.10$)
- ↗ Borderline significantly correlated ($p < 0.10$)
- ↗ Statistically significantly correlated ($p < 0.05$)
- ↘ Statistically significantly negatively correlated ($p < 0.05$)

teacher outcomes

Increased teaching skills, specifically, process of science and inquiry based teaching	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Percent of class time observed devoted to all investigation-related activities	+	NA
Percent of class time observed devoted to student-directed investigation-related activities	+	NA
Students' observation/perception of amount of inquiry practices in classroom	+	↗

Increased teaching skills, specifically, process of science and inquiry based teaching	Comparison to nonUA		Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
	UA returning	UA new		
Change from fall to spring in teachers' self-report of extent to which they engage their students in scientific inquiry	+	●	●	●
Change from fall to spring in teachers self-report of how competent they feel incorporating inquiry in the classroom	+	●	+	●
Change from fall to spring in teachers self-report of how competent they feel engaging their students in science	●	●	●	●

Increased positive attitude towards teaching science	Comparison to nonUA		Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
	UA returning	UA new		
Change from fall to spring in teachers' self-reported attitude toward teaching science	+	●	●	↗
Change from fall to spring in teachers' response to the item "My enthusiasm for science inspires enthusiasm in my students"	●	+	+	●

Increased perception of being part of a professional learning community	Comparison to nonUA		Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
	UA returning	UA returning		
Change from fall to spring in teachers' self-reported frequency of interactions with other teachers	●	●	●	●
Change from fall to spring in teachers' self-reported enjoyment of professional learning opportunities	+	+	+	●
Change from fall to spring in teachers' response to the item "I feel like I am a part of a science professional learning community"	●	●	●	●

Increased positive attitude towards the partner informal science institutions	Comparison to nonUA		Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
	UA returning	UA returning		
Change from fall to spring in teachers' attitude towards the partner informal science institutions	+	●	+	●

Teachers with greater interest and involvement in the program will have students who also have greater involvement in the supplemental/ voluntary portions of the program.	Result
Correlation of score of teacher involvement in professional development and UA events with proportion of students who used tickets to visit institutions and submitted a Science Celebration proposal	●

Increased teaching skills, specifically, process of science and inquiry based teaching	Differences in the Fall Compared to nonUA	
	UA returning	UA new
Teachers' self-report of extent to which they engage their students in scientific inquiry	+	●
Teachers self-report of how competent they feel incorporating inquiry in the classroom	●	●
Teachers self-report of competent they feel engaging their students in science	+	●

Increased positive attitude towards teaching science	Differences in the Fall Compared to nonUA	
	UA returning	UA new
Teachers' self-reported attitude toward teaching science	●	●
Teachers' response to the item "My enthusiasm for science inspires enthusiasm in my students"	+	●

Increased perception of being part of an professional learning community	Differences in the Fall Compared to nonUA	
	UA returning	UA new
Teachers' self-reported enjoyment of professional learning opportunities	+	+
Teachers' response to the item "I feel like I am a part of a science professional learning community"	+	+

Increased positive attitude towards the partner informal science institutions	Differences in the Fall Compared to nonUA	
	UA returning	UA new
Change from fall to spring in teachers' attitude towards the partner informal science institutions	●	●

student outcomes

Increased positive attitudes towards science	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Change from fall to spring in students' attitude towards science	●	↗

Increased confidence in ability to do science projects	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Change from fall to spring in students' perception of their ability to do various science investigation-related activities	●	↗

Increased understanding of science process and inquiry	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Statewide standardized assessment scores	NA	NA

Greater interest in pursuing science opportunities	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
UA students' response how likely they were to become an Urban Advantage Student Leader in the summer or next year		↗
Students' self-reported likelihood of engaging in science-related activities in the summer or next year	+	↗
Students' self-reported likelihood of visiting the informal science institutions in the summer or next year (Note: UA students could use free tickets in the summer)	+	●

Increased usage of the institutions	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Change in number of visits to partner information science institutions from 6th grade to 7th grade	+	●
Students' self-reported field trips to the partnering institutions in 7th grade	+	●
UA students' self-reported attendance at Family Science Days at partnering institutions in 7th grade		↗
Students' self-reported visits with family or friends to the partnering institutions in 7th grade	+	↗
Students' self-reported attendance at a school-based science-related event and completion of a science fair or UA Science Celebration project in 7th grade	+	↗
Change from fall to spring on attitude toward Denver Zoo	●	●
Change from fall to spring on attitude toward Denver Botanic Gardens	●	●
Change from fall to spring on attitude toward Denver Museum of Nature & Science	●	↗

Greater pride in their work	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Change from fall to spring in students' response to the item "I am proud of the work I do in my science class"	●	↗
Change from fall to spring in students' response to the item "I have done a science project I am proud of"	●	●

Greater perception of self as someone who pursues science	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Change from fall to spring in students' response to the item "I consider myself a scientist"	●	●
Family perception of impact of 7th grade science on student's interest in science	●	↗

family outcomes

Greater support for their student pursuing science	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Change from fall to spring in extent to which family engages in science-related activities and supports their student in science	●	↗
Perception of impact of 7th grade science on family support for student in science	●	↗

Greater relationship with the partnering institutions; through increased usage and knowledge of the partnering institutions	Comparison of UA to nonUA	Among UA Participants, Correlation with Teacher Participation in UA Score
Change in number of visits to partner information science institutions from 6th grade to 7th grade	+	●
Change from fall to spring in families' relationship with Denver Zoo	●	●
Change from fall to spring in families' relationship with Denver Botanic Gardens	●	●
Change from fall to spring in families' relationship with Denver Museum of Nature & Science	●	●
Impact of 7th Grade Science on family relationship with informal science institutions	+	↗