



RESOURCES

TITLE | EVALUATING YOUR PROGRAM: BUILDING BUY-IN WITH DATA

CATEGORY | Buy-In

OVERVIEW | This document provides guidance and a framework for evaluating programming and impact.

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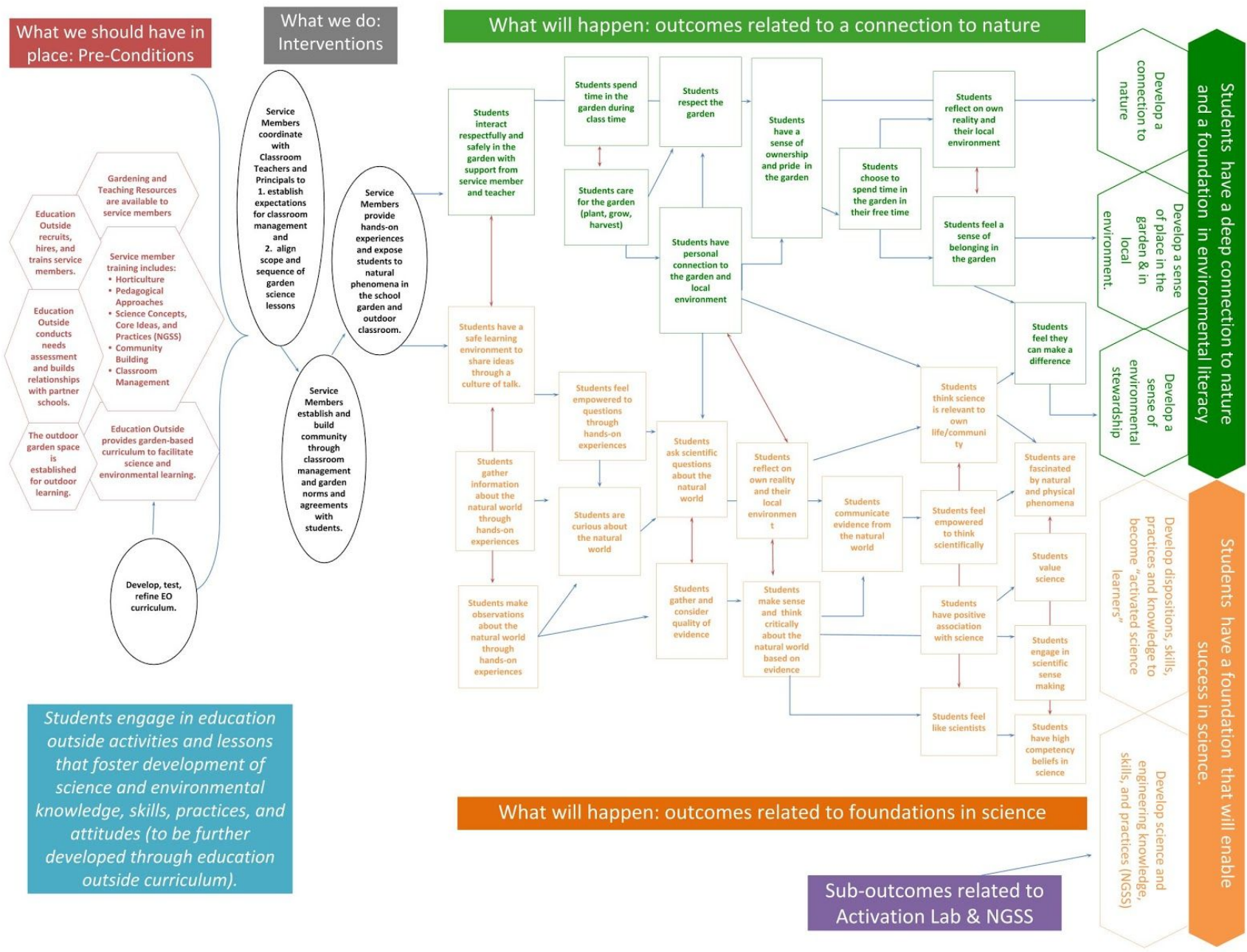
Introduction:

Evaluation is an important investment for any organization seeking to have an impactful program, for gaining insight into what that impact may be, and for building buy-in and support for a program. In this document, we'll describe what evaluation is, the types of evaluation that Education Outside engaged in, and share our evaluation instruments and results. We do not cover, in detail, how to create or support an organization focused on data-driven learning. For an in-depth review of this topic, please utilize Learning for Action's "Environmental Education Better Results Toolkit" linked in the Resources section below. LFA's Toolkit is an invaluable resource for understanding and framing how your program works and for launching an inquiry into the impact your program has or hopes to have. The Toolkit is broken into three phases: (1) Articulating your Theory of Change, (2) Measurement Planning and Implementation, and (3) Continuous Improvement. This document will share Education Outside's theory of change (and how it evolved) and the ways Education Outside used measurement to better understand the impact of and ways to improve our program.

Theory of Change:

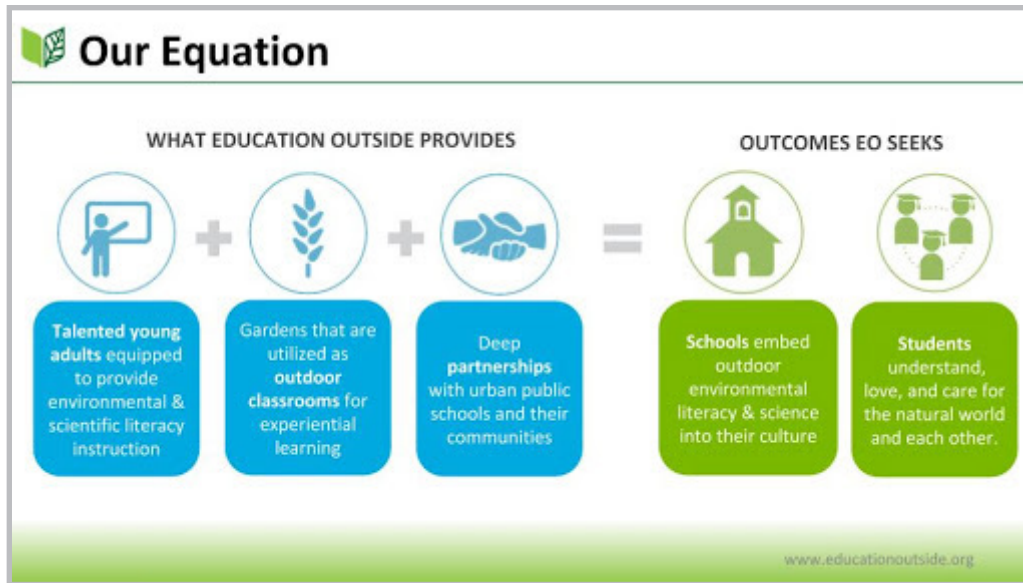
A theory of change is a process that helps define the need, target population, core components, and outcomes of a program. Articulating this, regardless of stage of design or implementation, helps leadership clarify the purpose and metrics of the program.

Education Outside's Theory of Change (Complex):



Education Outside's Theory of Change (Simplified):

The school garden and environmental education fields are still working to understand the potential impacts of our collective work in bringing students outside to learn and connect with nature. There is no one way to influence and impact children and no one evaluation instrument that the field uses across all programs. The research is still growing and evolving. These factors can make it challenging for a program to focus its work and measure impact meaningfully. Education Outside created the first, more complex, theory of change above as our initial attempt at describing our program and intended impact. We created this theory of change with the help of The Lawrence Hall of Science's Research Group as they conducted an evaluation of our program. Over time, we grappled with the research, each aspect of our program, and what our evaluation data was telling us and distilled our theory of change into the simplified version above.



Evaluation

Once a program's theory of change is articulated, the focus should then turn to "evaluation" or the data gathering and measurement that will provide insight into whether a program is working and how to improve it.

Education Outside engaged in both "process" evaluation and "outcome" evaluation. A process or implementation evaluation looks at a program as it is implemented and seeks to understand whether or not the way a program is implemented supports the desired outcomes outlined in its theory of change. An outcome evaluation looks at the impact of the program after it has been fully implemented. "Outcomes" relate to the level of performance or change that occurred due to a program being implemented.

Most of Education Outside's evaluation efforts were "formative," meaning they were used to help develop and improve the program and were not "summative" in nature, requiring rigorous research methodologies and making conclusive statements about Education Outside's effectiveness. Education Outside had not solidified its program enough for us to feel ready to invest in and conduct a summative evaluation. We instead chose to focus on improvement. We gathered both quantitative and qualitative data. Quantitative data and analysis "assumes a fixed and measurable reality," whereas qualitative data and analysis "assumes a dynamic and negotiable reality." The uses and methods for each are more fully outlined in the table below. For quantitative surveys, Google Forms is an option for simple surveys, but a more robust platform, such as SurveyMonkey, is recommended for more rigorous data gathering and analysis. For qualitative evaluation, depending on the method of data gathering (interviews, case studies, focus groups), a more in-depth protocol is required. There are online tools for gathering and analyzing qualitative data; Education Outside did not have experience with these.

Education Outside Evaluation	Evaluation Type	Methods & Analysis
U.C. Berkeley, Lawrence Hall of Science Research Group Implementation Evaluation <i>(One-time, 1 year duration)</i>	Qualitative	Participant (principals, teachers, corps members) observations, interviews, focus groups, and case studies; data were analyzed by themes
Science Activation Surveys <i>(Yearly in fall and spring)</i>	Quantitative	Participant (student) pre and post surveys; data were analyzed by numerical comparisons and statistical inferences
Teacher/Corps Member Impact Interviews <i>(Yearly in spring)</i>	Qualitative	Participant (teacher or corps member) interviews; data were analyzed by themes
Teacher Impact Surveys <i>(Yearly in spring)</i>	Quantitative	Participant (teacher) survey; data were numerically analyzed using measures of central tendency (A measure of central tendency is a single value that attempts to describe a set of data by identifying the central position within that set of data. ²)
Corps Member Surveys <i>(2-4x Yearly; See Program Evaluation & Feedback in the Table of Contents for more)</i>	Quantitative	Participant (corps members) surveys; data were analyzed by numerical comparisons and statistical inferences

Example quantitative teacher surveys and qualitative teacher and corps member interview protocols:

Quantitative Teacher Survey Sample:

Likert Scale Agreement Levels: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree
Science knowledge, skills, and mindsets:

As a result of participating in the Education Outside program this year...

- My students better understand important earth and life science concepts.
- My students know how to use scientific tools such as hand lenses, rulers, or thermometers.
- My students try new things in the garden which leads to deeper discovery and inquiry.
- My students better engage in science practices.
- My students are fascinated with scientific phenomena in the garden.
- My students value science more.

Connection to nature and care for the earth:

As a result of participating in the Education Outside program this year...

- My students understand that they live on a planet that supports them and other life.
- My students understand that their actions have an impact on the planet.
- My students are more comfortable in the outdoors.
- My students are more connected to nature.

- My students show more empathy towards living things in the garden.
- My students are excited about and engaged in caring for the garden.

Healthy mindsets and behaviors:

As a result of participating in the Education Outside program this year...

- My students know where their food comes from.
- My students like to cook and eat vegetables in the garden.
- My students feel that the garden is a safe space.
- My high-need students are more engaged in learning.

Qualitative Teacher Interview Protocol

This protocol was created in collaboration with the firm Dialogues in Action during a CaliforniaVolunteers-supported program called "Project Impact" in 2017.

Connection to Nature:

- What changes have you seen in your students' abilities to recognize the plants and animals in the garden since participating in the Education Outside classes? >>How has your students' relationships to nature changed as a result of their experience in the garden?
- What changes have you observed in how students engage with the natural world since participating in Education Outside? >> How is this helping students become more at home in the natural environment/outside?
- In what ways are your students more excited about being outside since participating in Education Outside? >> How are they communicating or sharing this excitement with others? >> How has this helped them become more passionate about the outdoors and more passionate about learning?

Stewardship:

- What do you think your students have learned about the impact of their actions on the environment since participating in EO classes outside? What were you still hoping they'd learn that they haven't yet? >> How has this changed their beliefs about their role in impacting the environment?
- What are the students doing to show care towards their environment since participating in EO classes outside?>> In what ways do you think the students are becoming stewards/protectors of the environment?
- What changes have you noticed in your students' levels of compassion or responsibility when they talk about the environment since participating in EO classes outside? >> How do you think this has translated to their lives beyond the classroom? (Ex: home or family life) >> How has this made them more committed to caring for and protecting the natural world/outdoors?

Science Habits of Mind:

- How do your students recognize the value of curiosity (or asking questions) differently since coming to Education Outside classes? >> In what ways do you think the students embrace curiosity (or asking questions) now more than they used to?
- How have your students practiced science in the garden? What about science practices continues to be difficult for them to do?>> How has this helped your students change their orientation towards science?
- In what ways have you noticed that students are more confident about exploring outside in the garden? >> How might this signal a deeper level of dedication for exploring in other areas of their life?

Qualitative Corps Member Interview Protocol

Impact on Students' Connection to Nature:

1. In what ways are your students more excited about being outside since participating in Education Outside? >> How are they communicating or sharing this excitement with others? >> How has this helped them become more passionate about the outdoors and/or more passionate about learning?
2. What changes have you observed in how students engage with the natural world since participating in Education Outside? >> How is this helping students become more at home in the natural environment or outside?

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Impact on Students' Stewardship:

1. What do you think your students have learned about the impact of their actions on the environment since participating in EO classes outside? >> How has this changed their beliefs about their role in impacting the environment?
2. What are the students doing to show care towards their environment since participating in EO classes outside? >> In what ways do you think the students are becoming stewards/protectors of the environment?

Curriculum

1. What lesson(s) do you think best facilitate student practice of science? >> How do you see these lessons resulting students' love of science?
2. What lesson(s) most changed your students' level of comfort in the garden? >> How has that shaped their ownership or care for the garden?

Training

1. What skills have you developed because of training that EO provided? >> How have these skills influenced your identity as a leader?
2. What would you consider the essential elements of your training? >> How have these essential elements shaped your beliefs about education?

Evaluation Results 2015-2019

Quantitative Impact Survey

In the spring of 2017, 2018, and 2019, EO conducted a quantitative survey of classroom teachers at schools in the program. The survey included a section on program impact which centered around student connection to nature, stewardship, science habits of mind, and in 2018, healthy mindsets and behaviors.

2017 Quantitative Teacher Survey Results

n = 285 Teacher Respondents

Likert Scale 1: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

Likert Scale 2: Not at all Confident, Somewhat Confident, Confident, Very Confident

- As a result of participating in the Education Outside program:
 - My students better understand that they live on a planet that supports them and other life.
 - 91% of teachers agreed or strongly agreed
 - My students better recognize specific elements in their environment such as plants, animals, rocks, and soil.
 - 94% of teachers agreed or strongly agreed
 - My students are more connected to the environment, including nature.
 - 92% of teachers agreed or strongly agreed
- As a result of participating in the Education Outside program:
 - My students feel _____ about asking questions in the garden.
 - 92% of teachers responded "confident or very confident"
 - My students feel _____ about engaging with their peers about their observations or findings in the garden.
 - 88% of teachers responded "confident or very confident"
- As a result of participating in the Education Outside program:
 - My students better engage in science practices such as asking questions.
 - 85% of teachers agreed or strongly agreed
- As a result of participating in the Education Outside program:
 - My students understand that their actions impact the environment.
 - 87% of teachers agreed or strongly agreed
 - My students show more empathy towards living things in the garden.
 - 91% of teachers agreed or strongly agreed

- My students are excited about caring for the environment.
 - 91% of teachers agreed or strongly agreed

2018 Quantitative Teacher Survey Results

n = 336 Teacher Respondents

Likert Scale: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

- As a result of participating in the Education Outside program this year:
 - My students better understand important earth and life science concepts.
 - 90% of teachers agreed or strongly agreed
 - My students know how to use scientific tools such as hand lenses, rulers, or thermometers.
 - 65% of teachers agreed or strongly agreed
 - My students try new things in the garden which leads to deeper discovery and inquiry.
 - 90% of teachers agreed or strongly agreed
 - My students better engage in science practices.
 - 83% of teachers agreed or strongly agreed
 - My students are fascinated with scientific phenomena in the garden.
 - 90% of teachers agreed or strongly agreed
 - My students value science more.
 - 85% of teachers agreed or strongly agreed
- As a result of participating in the Education Outside program:
 - My students understand that they live on a planet that supports them and other life.
 - 90% of teachers agreed or strongly agreed
 - My students understand that their actions have an impact on the planet.
 - 91% of teachers agreed or strongly agreed.
 - My students are more comfortable in the outdoors.
 - 91% of teachers agreed or strongly agreed
 - My students are more connected to nature.
 - 92% of teachers agreed or strongly agreed
 - My students show more empathy towards living things in the garden.
 - 90% of teachers agreed or strongly agreed
 - My students are excited about and engaged in caring for the garden.
 - 93% of teachers agreed or strongly agreed
- As a result of participating in the Education Outside program:
 - My students know where their food comes from.
 - 86% of teachers agreed or strongly agreed
 - My students like to cook and eat vegetables in the garden.
 - 78% of teachers agreed or strongly agreed
 - My students feel that the garden is a safe space.
 - 96% of teachers agreed or strongly agreed
 - My high-need students are more engaged in learning.
 - 78% of teachers agreed or strongly agreed

2019 Quantitative Teacher Survey Results

n = 279 Teacher Respondents

Likert Scale 1: Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly Agree

Likert Scale 2: Not at all Confident, Somewhat Confident, Confident, Very Confident

- As a result of participating in the Education Outside program:
 - My students better understand that they live on a planet that supports them and other life.
 - 88% of teachers agreed or strongly agreed
 - My students better recognize specific elements in their environment such as plants, animals, rocks, and soil.
 - 90% of teachers agreed or strongly agreed
 - My students are more connected to the environment, including nature.
 - 86% of teachers agreed or strongly agreed
- As a result of participating in the Education Outside program:
 - My students feel _____ about asking questions in the garden.
 - 90% of teachers responded “confident or very confident”
 - My students feel _____ about engaging with their peers about their observations or findings in the garden.
 - 89% of teachers responded “confident or very confident”
 - My students feel _____ about constructing explanations in the garden.
 - 77% of teachers responded “confident or very confident”
- As a result of participating in the Education Outside program:
 - My students better engage in science practices such as asking questions.
 - 81% of teachers agreed or strongly agreed
- As a result of participating in the Education Outside program:
 - My students understand that their actions impact the environment.
 - 86% of teachers agreed or strongly agreed
 - My students show more empathy towards living things in the garden.
 - 89% of teachers agreed or strongly agreed
 - My students are excited about caring for the environment.
 - 87% of teachers agreed or strongly agreed

Qualitative Impact Teacher Interview

In the spring of 2017, Education Outside conducted qualitative impact interviews with classroom teachers. The interview protocol centered around student connection to nature, stewardship, and science habits of mind.

- Qualitative Interview Results (n = 5 Teacher Interviews):

- **Finding 1: Connection is Critical:** Our data suggest that from trying a kale salad to touching snails, supporting new experiences in nature for students served as the catalyst for connection, deeper inquiry and learning.
- **Finding 2: The Secret Sauce: Instructors Drive Change:** Our data suggest that students’ experience depends on the instructor’s ability to inspire and ignite curiosity, ask compelling questions and experiment, and cultivate an environment that allows students to explore and learn about the unfamiliar.
- **Finding 3: There’s a Pathway to Stewardship:** Our data suggest that there are multiple key steps needed before students respond and take responsibility for their environment: curiosity, trying new things, developing comfort in the garden, developing empathy and love for the garden, and finally, stewardship of the garden.
- **Finding 4: Science is Practiced (in the Garden Classroom):** Our data suggest that in order to develop scientific habits of mind, students must practice science; teachers love the garden because it’s hands-on and provides a space for this practice.
- **Finding 5: Food is an Engagement Strategy, Duh!:** Our data suggest that food plays an important and perhaps critical role in shaping student experience and learning in the garden. Planting, harvesting, cooking, and eating food that is grown in the garden is often what is most remembered and exciting to students.
- **Finding 6: Back to Basics: Recycling and Composting:** Our data suggest that recycling and composting are important hands-on activities that have direct impact on student’s understanding of their role in preserving the environment.
- **Finding 7: In it Together: Collaboration is Key to Making Science Happen in K-5:** Our data suggest that collaboration and support from corps members helps teachers provide science instruction at the elementary level.

2015-2019: Science Activation & Environmental Literacy Pre/Post Surveys

Science Activation is a National Science Foundation-funded body of research exploring what dispositions and mindsets set students up for success in science learning. This research is led by U.C. Berkeley's Lawrence Hall of Science and the University of Pittsburgh.

- For more information, please visit: <http://www.activationlab.org/>
- Survey instruments can be found here: <http://activationlab.org/toolkit/#Step2>
- Surveys were administered electronically to all 4th and 5th grade students in the fall (pre) and spring (post).
- Pre/Post Results (n = approx. 5000 student respondents pre and post, yearly):
 - In both the 2015-2016 and 2016-2017 school years, we found statistically significant gains in students' fascination and value of science in our lowest income schools.

Outputs

Outputs tell the story of a program's activities and can be easily quantified. Below are the outputs that Education Outside tracked yearly:

- Number of students served
- Number of schools served
- Number and type of lessons taught
- Number of minutes of informal garden time
- Number of workdays
- Number of volunteers, including parents and community members
- Number of volunteer hours
- Number of field trips
- Number of special events at school
- Number of corps members supporting lunchroom composting
- Number of student green teams (leadership groups)

Improvement

Education Outside used data to inform our program design and improvement in many ways. The Lawrence Hall of Science's in-depth implementation evaluation of our program helped us clarify our theory of change. We better implemented our program by understanding how to improve corps member support and training and developing program-specific curriculum designed for multiple learning styles. We also defined gardens as more than just outdoor classrooms to teach science, but also as places for de-escalation during conflict and community building. Our surveys helped us understand the impact of our program on students based on teacher and corp member observation/experience of the program. Surveys helped us understand how to improve our corps member trainings, the way corps members supported their school communities, and more.

It is recommended that programs invest appropriately in evaluation, analysis, and program improvement. A staff person focused on evaluation can help support data gathering and analysis. They can also keep staff engaged in the learning by integrating evaluation into the fabric of an organization's processes. Yearly staff reviews of data gathering activities, instruments, and what will be done with the data once it's been analyzed are very important in creating a culture of data-driven learning and improvement within an organization.

Appendix:

- [Education Outside Project Impact Full Report \(2017\)](#)

References:

1. McLeod, Saul, Simply Psychology (2017). Retrieved on June 1, 2019 from <https://www.simplypsychology.org/qualitative-quantitative.html>
2. Laerd Statistics, retrieved on June 1, 2019 from <https://statistics.laerd.com/statistical-guides/measures-central-tendency-mean-mode-median.php>

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Resources:

3. Learning For Action, Environmental Education Better Results Toolkit: <http://learningforaction.com/environmental-education-better-results-toolkit>
4. Lawrence Hall of Science Science Activation Lab: <http://www.activationlab.org/>
5. Lawrence Hall of Science Research Group: https://www.lawrencehallofscience.org/about/research_group
6. Dialogues In Action: <http://www.dialoguesinaction.com/>



Project Impact Report

Summer 2017



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1. Organization and Program Overview

Education Outside advances science education and environmental literacy by teaching outdoors in public schools. We spark children's interest in science and connect them to the natural world through hands-on learning in school gardens. We are working toward a future in which all children—regardless of race, class, or geography—have positive early experiences practicing science and connecting to the natural world. Through our work, future generations will grow up to be scientifically and environmentally literate, therefore equipped to tackle the pressing environmental challenges of our time.

Education Outside grew out of a grassroots coalition known as the San Francisco Green Schoolyard Alliance, which led a successful campaign to secure nearly \$14 million in city bond funding to design and construct green schoolyards at 84 public schools throughout San Francisco Unified School District—one of the largest green schoolyards systems of any school district in the country.

Through our work with school communities, Education Outside realized that in order to thrive, green schoolyards need dedicated educators and stewards—an impossibility for many schools with limited resources. In 2011, we started a service corps of emerging leaders who are passionate about nature, science, the environment, social justice, and elementary education. Since our founding, we have recruited talented, passionate leaders from around the country to serve with us, teaching engaging, standards-based science and environmental literacy lessons in public elementary schools. Our program debuted in San Francisco Unified School District, and now we are expanding to serve other public school districts in the California Bay Area.

Education Outside is a nonprofit organization that currently operates at over 50 schools around the Bay Area. As a proud member of the AmeriCorps family of service organizations, our corps member program is our sole effort and was the focus of this study. Corps members each serve for two years at a public elementary school and their primary role is to teach hands-on engaging science and environmental literacy lessons in the garden classroom throughout the school year. Members teach across all six elementary grade levels from kindergarten to fifth grade. Corps members also work with the school community to foster environmental literacy throughout the school culture through projects such as lunchroom composting. In addition, corps members oversee the maintenance of the school's garden and implement improvement projects as needed. Students in the Education Outside program all receive at least 12 classes in the garden per year, each for 45 minutes. Schools with smaller student numbers receive up to 30 classes in the garden a year. Classroom teachers accompany their classes to the garden to collaborate, observe and support student learning outside, as well as model classroom management. We interviewed teachers for this study because they attend Education Outside classes, they collaborate with corps members, and have a front row seat to their students' learning.

Education Outside: www.educationoutside.org

Education Outside's Intended Impact

Education Outside aims to impact local students in a few critical ways. In an Education Outside school garden, students develop a comfort in their local environment that fosters healthy risk-taking and

promotes deeper discovery. This ultimately leads to the development of empathy toward and care for the environment. Also, by practicing science in the garden, students develop foundational scientific habits of mind in a naturally fun and engaging way. As a garden-based education program, these impacts are important in that they are aligned to the larger education and environmental fields. A 2010 study conducted by the Lawrence Hall of Science at U.C. Berkeley on the state of elementary science education in California called *High Hopes, Few Opportunities* revealed that due to the emphasis on English language arts and math over the last 15 years, high quality science learning opportunities are only available in about 10% of California elementary school classrooms on a regular basis. The study also stated that forty percent of elementary teachers said they spend just 60 minutes or less teaching science each week, while just one-third of elementary teachers said they felt prepared to teach science. Our program's focus on science learning activation is addressing this issue facing elementary science education. In addition, Education Outside's focus on environmental literacy connects our work to the larger environmental field tackling important and urgent issues such as climate change by connecting students to the environment so that they might develop a sense of responsibility to steward it. Many garden-based education programs are focused on food and nutrition, and while a big part of our program is planting, harvesting, cooking, and eating from the garden, we do this all through the lens of science and environmental literacy.

2. Evaluation Methodology

The aim of our evaluation was to see what kind and quality of impact we are having on Bay Area students who participate in our program. Over the course of the project, we (a) developed and refined our ideas of intended impact and indicators, (b) designed and implemented both qualitative and quantitative means to collect and analyze data, and (c) identified findings and considered the implications to those findings for program adjustments and renovations.

This project began with a focus on the work of identifying and clarifying the intended impact of each of one of our signature programs. Once the ideas had been developed, and indicators had been identified, we then designed a questionnaire to collect data about quantitative measures and a qualitative interview protocol to collect qualitative data. These data were analyzed. Themes were identified and then translated into findings. From the findings, we developed program responses and communiques.

Qualitative Data & Analysis

For the qualitative portion of the evaluation, we designed an in-depth interview protocol to gain data about the structural, qualitative changes resulting from our program. We identified a sample of subjects using a purposeful stratified technique to select a representation of the population we served. Our population size was approximately 800. We planned to draw our sample from the following strata of our population:

Dosage

- Weekly classes in the garden
- Biweekly/Block schedule of classes in the garden

Socioeconomic Status (SES)

- 50% Free & Reduced Lunch
- Not 50% Free & Reduced Lunch

Grades

- Kindergarten-2nd Grade

- 3rd-5th Grade

We then convened one-on-one interviews lasting from between 45 minutes and one hour in length. Data were collected and we applied a four-step model of textual analysis to each of the interviews. This process allowed us to interpret the meaning and significance of the interview data. We then examined the overarching themes that emerged from the full scope of our data analysis to illuminate the primary insights and discoveries.

Limitations of Findings:

It is important to note that our sample size was a total of 5 teachers. This factor as well as several others limit our ability to generalize our findings to make broad and conclusive statements about Education Outside's impact. These include:

1. Small sample size (5 interviews conducted): The small sample size means that we have derived our findings from a very narrow proportion of the population with which Education Outside has worked in the past year.
2. Interview versus survey responses: Because the survey responses were anonymous, we have no way to know who took the survey and whether there was overlap in these respondents. However, due to our small qualitative sample size, overlap is possible but not probable.
3. Selection biases: We spoke with teachers who were supportive of our program and willing to speak with us for the interview. They were also easy to contact and schedule.
4. Team limitations and time constraints: Due to limitations in manpower and resources, much of the data collection was conducted by one team member, and thus there may be some potential researcher bias in the interpretation of the data.

Quantitative Data and Analysis

For the quantitative portion of the evaluation, we designed a questionnaire to collect data on our quantitative indicators of impact. We administered this instrument to approximately 810 teachers and had a response rate of 35%, with a total of 283 responses. The data were analyzed primarily using measures of central tendency.

Our evaluation produced findings which capture the primary discoveries from the data. The most significant findings are described in the following narrative.

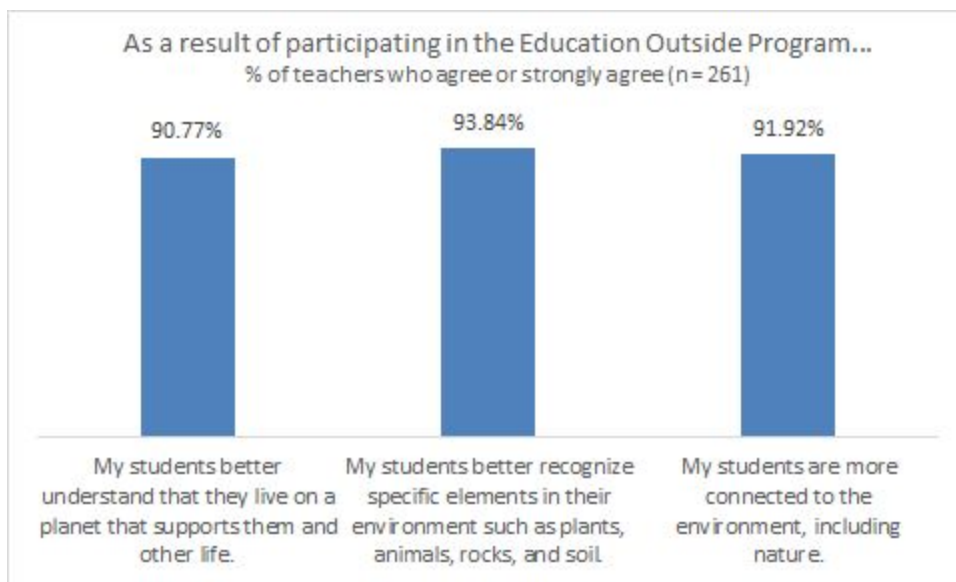
3. Findings and Responses

Finding 1: Connection is Critical

Description:

Connection to nature is the fundamental concept that permeated all of our responses. Our data showed that from trying a kale salad to touching snails, students' connection to nature served as the catalyst for learning and impact, making our end goals of environmental stewardship and scientific habits of mind possible. This concept is the unifying force that blanketed each response because it's embedded within every aspect of the work we do, and the repetition of outdoor classes and the emphasis on patterns seen within nature reinforced this connection.

In our quantitative data we found that teachers overwhelmingly agreed that their students had a stronger connection to nature as an end result of the program. Surprisingly, we did not see the same pattern in the interviews we conducted. When exploring the answers in the interviews, what surprised us was that connection to nature was not explicitly stated as the end goal or the gains that students received. Instead, this connection was interwoven into every aspect of their answers, revealing how much that connection to nature acted as the means and vehicle for delivery, in addition to serving as an end goal. It's hard to draw connection to nature out as a topic because it's woven into every aspect of the work that we do. Instead, teachers highlighted that working with snails (the means) cultivated a sense of risk-taking and comfort within students (the end) or supporting plants growing from seed to fruit (the means) allowed for students to try new activities and foods, developing process skills and student empowerment (the end).



The differing ways that connection emerged in our data surprised us and brings up new considerations in how we highlight connection to nature in our impact. We would like to assess the importance of connection to nature in our program delivery, whether we should cultivate connection as either a vehicle that leads to to our intended impacts, or an impact in itself. Ultimately, this data shows that our impacts are interdependent on one another, and that feeling connected to nature is the key to unlocking them. Connection to nature appears to be both the means to our ends - stewardship and scientific habits of mind - and an end in itself. This combination creates conscious thinkers, lovers, and doers in our world to give back to the environment and advocate for our interconnected, co-dependent lives.

Significance

Education Outside (EO) has always viewed connection to nature as an impact we're hoping to see in our students and school communities. We learned through our interviews and surveys that connection plays a key role in our program, but in a variety of ways.

When our instructors utilize the natural world around them to create immersive, hands-on educational experiences, students cultivate a connection to nature that is not only fulfilling in itself, but also enables them to develop the skills to ask questions, to think critically about the world around them, and to act and advocate on behalf of our environment and all embedded within the ecosystem. This signifies the importance of the environmental content coupled with hands-on learning as essential to accomplishing our goals and fulfilling our vision to create environmental stewards prepared to tackle the environmental challenges of our time. This connection to nature is the foundation--the unifying force that brings our environmental stewardship and science habits of mind pathways together.

Responses

With this finding in mind, Education Outside can be more explicit about the significance of connection to nature as the foundation of our programming, serving as both a means and an end in our promotional materials and internal documentation. Through nature, kids are provided the opportunity to take educative risk, develop empathy, and think critically about the world around them. We can also explicitly elevate this finding with existing research that's been conducted by organizations like the Children & Nature Network. Utilizing existing research coupled with the development of our own formative evaluations to understand when connection to nature occurs and what themes emerge across our program would be useful to bolster the delivery and presentation of our impact.

We may also experiment with program innovation moving forward, partnering with organizations that create immersive nature experiences over several days to explore the differences in impact between immersive, multi-day experiences and the consistent daily programming provided by Education Outside. Exploring the effects of different types of dosage models on cultivating a connection to nature would allow us to concretize the program models we can promote or utilize in future years. Finally, we could experiment with programmatic content, exploring what elements within our curricula are needed to develop a connection with the natural world and ways we can maximize that connection. We should also explore the nuances in language and programming in our program, defining if we're focusing on a connection to nature or the environment. Environment can be defined more broadly than nature, such as protesting a local power plant causing health and environmental issues in a local neighborhood. Should our curricula focus exclusively on the natural world or incorporate elements of the built environment and social landscape as well? Identifying the benefits of each approach--natural world and the environment--and the best model for child development given the age and demographics we serve will help inform the extent we should adapt our program.

Finding 2: The Secret Sauce: Instructors Drive Change

Description

Instructors serve as the catalyst of change for our organization-- they provide the secret sauce, and the correct formula and recipe can make or break our ability to deliver our program and create impact. Teachers noted that their students' experience depends on the instructor's ability to inspire and ignite curiosity, ask compelling questions and experiment, and cultivate an environment that allows students to explore and learn about the unfamiliar. Teachers who've experienced multiple Education Outside instructors over the years noted a difference in instructor quality and its effect on their students' experience of the program. For example, students received less science content or process skills when an instructor had less teaching experience, compared to previous EO instructors with whom the classroom teacher had worked. One teacher noted that the content students learn "depends on the school site and teacher, the corps member's experience, and what is in bloom. I've been at two sites

with EO and have experienced three corps members. And with our current corps member, he's a first year teacher, and he didn't spend as much time on ID'ing plants and animals. With our previous corps member, the students were aware of what was growing. And at my first school with EO, the kids knew everything. Whatever corps members say often enough the students will learn, but it depends on the corps member." Teachers also noted that an instructor's previous expertise in an environmental or education content area enabled higher levels of engagement from students and teachers. Teachers were excited that an instructor's biology background provided the opportunity to study science at a deeper level in the Education Outside class or create a more collaborative curriculum. Teachers also noted that instructor quality can improve over time within our program, highlighting the higher quality of programming between a first and second year instructor. In addition to creating an engaging, hands-on learning experience, classroom management also appeared as a subtler theme that determined an instructor's success and our ability to reach our intended outcomes, which is a theme highlighted in past evaluation studies conducted by the Lawrence Hall of Science.

Significance

This finding is critical because it underscores an essential variable that determines our ability create our intended impact. Ultimately, our product depends on an instructor's capacity to inspire their students and deliver an engaging program experience. They are the agents of change. When our instructors can create a high quality program, this paves the pathway towards developing a stewardship ethic and scientific habits of mind within our students.

This finding around instructor quality has two main implications on our program. First, we must ensure our instructors are equipped to deliver the high quality programming that achieves our outcomes. This affects who we recruit and how we train our instructors. The second implication relates to the distribution of our impact. Tying a program's impact to an individual is risky, and Education Outside should look to diversify our vehicles for change, ensuring that impact is less tied to an individual. How can we bolster other elements of our programming, infrastructure, or communication materials to deepen impact, creating an enhanced and cohesive brand, culture, and experience of Education Outside? If we have multiple levers of change, we'll ultimately create greater potential to meet our impact goals, bolstering our ability to deliver even if one lever's performance is weaker than others. This combined response will enhance our instructor quality while codifying the Education Outside experience beyond the individual, allowing for multiple pathways to increase our impact.

Responses

There are two approaches to responding to instructors providing the primary vehicle for success. The first involves talent recruitment, development, and management. We should bring in talent that reflects the qualities we seek to successfully delivery our program at schools. We must also strengthen our Core Education Framework, which includes instructor professional development and performance management, to better prepare our instructors for success. If instructor quality is the determining factor for school's experience and create our intended impact, investment should be placed in these two areas.

We can also define other opportunities to increase our impact and elevate our mission that extend outside the realm of instructor quality. Perhaps this is through policy and communications, where we can work towards becoming a national influencer in environmental education. There are even small ways to distribute our impact-- such as a t-shirt or uniform that instructors wear each day, articulating the change we seek to create in our students (examples may be shirts with slogans such as: "Ask questions" or "Try Something New"). We can also elevate our partnerships to provide additional

learning opportunities beyond the instructor, on and off site. Our new partnership with the San Francisco Public Utilities Commission running field trips at an offsite demonstration garden showcases one area of potential impact. If each student in our program has a smattering of options to gain scientific habits of mind and an ethic of environmental stewardship, we are more likely to achieve our impact goals.

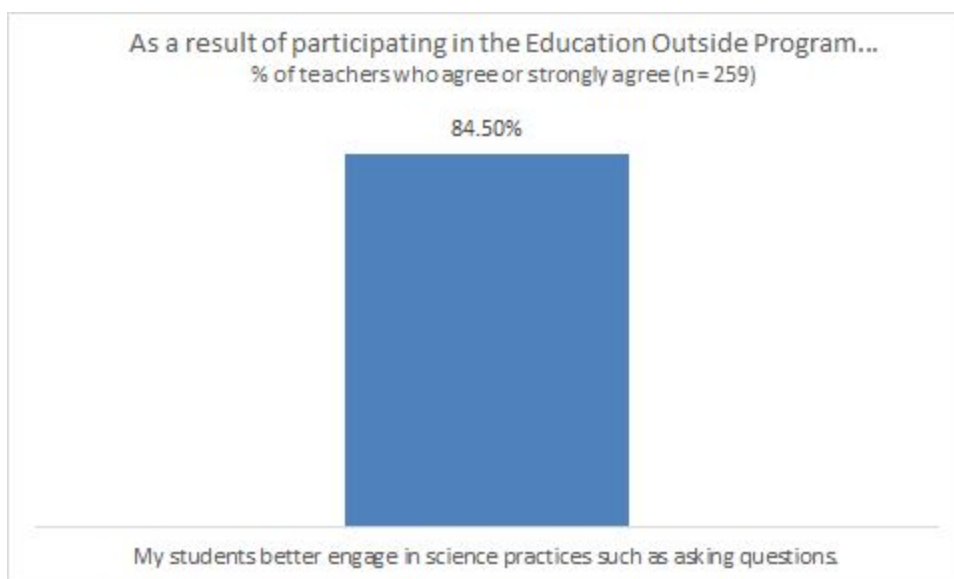
Finding 3: There's a Pathway to Stewardship

Description

Our data highlighted key social-emotional factors that led students to becoming stewards of their environment and the natural world. Stewardship wasn't an instantaneous reaction--students learned over the course of time with Education Outside programming how to care for their environment. While perhaps not always linear, there are key stages that lead a student to develop an awareness of who and what makes up their environment, and ultimately gain a call to action to respond and take responsibility. Multiple stages occurred to get students to respond and take responsibility for their environment: curiosity, risk-taking, comfort, empathy and love, and finally, stewardship.

First, students must become curious about the world around them. Teachers highlighted this as a common occurrence in Education Outside class, underscoring that the garden environment naturally supports child curiosity. With the emphasis on Education Outside programming on asking questions and conducting experiments, students are better equipped to explore their curiosity. Our quantitative data illustrates this well, where teachers agreed that Education Outside class equips students to ask questions.

Quantitative Data on Asking Questions



Curiosity fuels the desire for students to answer their questions, leading to one of our surprise findings and the second skill students develop on their Pathway to Stewardship: the importance of **risk-taking**. Risk-taking came up in interviews more often than anticipated, and while it's something we've always embraced as part of the learning process and impact we create through our programming, the interviews underscored how this social-emotional skill is crucial on the journey to our impact. Teachers

emphasized the ways in which students changed through risk-taking in the Education Outside program. One teacher shared a story about a time a student asked her to hold a snail, having the teacher model this for the student because the student was scared. Once the teacher modeled this action, the student then proceeded hold the snail, showcasing bravery and developing comfort along the way. Through this educative risk-taking, students became less afraid of the animals and environment around them, choosing to explore and play in nature outside. In addition, teachers noted the importance of Education Outside classes for English Language Development, where students who had been hesitant to participate in the classroom were now speaking freely and uninhibited in the garden. Taking risks requires courage and opportunities to take small risks are provided through Education Outside's programming; students then gain confidence to try new things and comfort in a new environment.

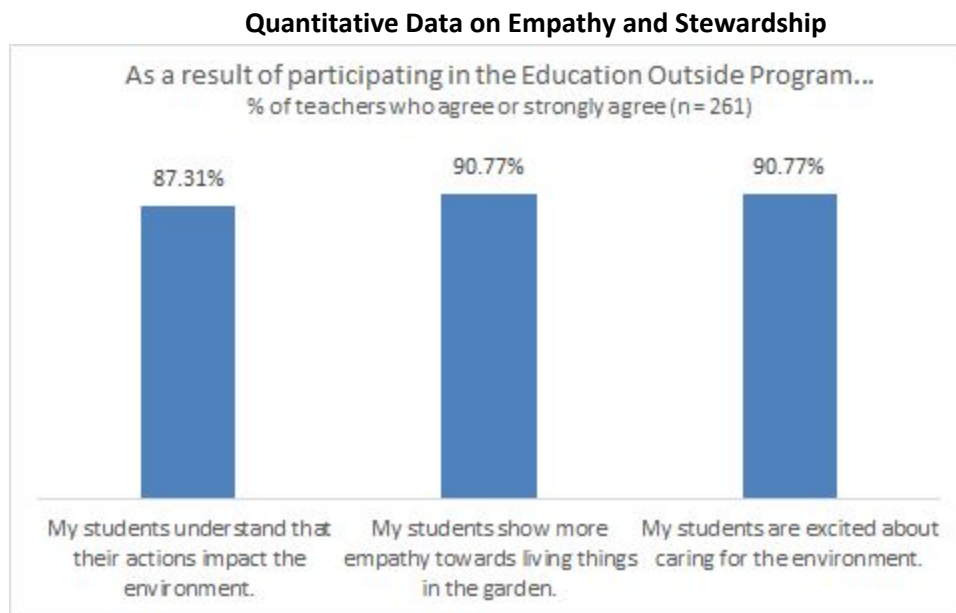
Taking risks leads to the third social emotional skill on our Pathway to Stewardship: **comfort** within their environment or the natural world. When students and teachers move from being afraid of snails to declaring them beautiful, as noted in our teacher interviews, this emphasizes the change in perspective and more open approach individuals take when they have a new perspective, mindset, and connection to nature. Teachers noted that students became more comfortable being outside as a result of Education Outside programming. They also appreciated the ways that having regular class time with Education Outside established a routine and habituation, and ultimately comfort within the outdoor environment. One teacher commented, "Some are more brave and try things: they ate honey with the honeycomb, they ate kale salad, they now pick up snails. One student asked me to pick up a snail, I didn't want to, but I did it. I had to be brave to pick things up, then the students did it too after they say me do it. Seeing things up close is really great. If there are aliens in the world, the snail is an alien! But they are beautiful. I appreciate things so much more, so students must feel similar."

Once students develop a sense of comfort with the natural world, they move beyond that comfort to the next stage: cultivating **empathy** and love for the outdoors. Our teachers note that students love being outside; this allows for far-reaching success of our program. The sense of empathy and love is deeper than simply a desire to be out of the indoor classroom. Teachers noted that their students killed bugs prior to Education Outside class; as a result of Education Outside's programming, they've stopped. Teachers heard comments from students such as, "how would you feel if you were stomped on?," illustrating their ability to empathize with living things beyond people. One teacher said, "Students are more connected to living things and what they need. They are making connections to what all things and people need. The songs our corps member does about this are great. One of my students was in tears when we first released butterflies, then later after we did more, she self regulated and said "They are at home." They recognize the need to take care of earth: Earth Day was wasn't just one day this year, it was all year long. They are kinder to each other. They are really taking it in."

Students also show their empathy in other ways, developing the patience and skills to wait for a strawberry that's still green to turn red, knowing that success will taste much sweeter if they can respect the slow process of change within plants while nurturing their growth. Education Outside's emphasis on hands-on learning, where students hold animals, care for plants, and study the natural world through experiential learning, allow for students to cultivate their sense of empathy.

Ultimately, students feel empowered to take care of things they love-- reaching our final goal on the Pathway to Stewardship. Students chose to take **responsibility for their actions and make pro-environmental choices**. From recycling and composting to watering plants on a regular basis, students demonstrated the multitude of ways that they take care of their environment. Students performing acts of environmental stewardship serves as one of our primary indicators of our program's

impact and success. Demonstrating a sense of stewardship showcases the extensive academic and social-emotional learning that is necessary to arrive at this state of agency. Our quantitative survey illustrate this impact best, as 90.8% of teachers surveyed agreed (41.92%) or strongly agreed (48.85%) that their students are excited about caring for the environment. One teacher said, “Students love being in the garden and love helping with garden jobs. They have no big fear of bugs this year, in 3rd grade. They are more than happy to dig up worms and dig for slugs. They are really curious and respectful to animals in the garden. They also really want to know more. The garden is uniform across grades, so it provides that exposure that may not be in each class. The structured EO program supports their interest in the outdoors.”



Finding 4: Science is Practiced (in the Garden Classroom)

Description:

Education Outside has long seen the response children have to the garden classroom. Elementary students enthusiastically come to the garden with spirits high and curiosity ignited, ready to engage. They know that the garden is not like the indoor classroom; the outdoor classroom is alive and dynamic. There are bugs and plants. There is dirt and water, and there are seeds. There’s fresh salsa, sauteed greens, and other delectables cooked right after they have been picked. Our interview data suggest and corroborate that teachers love the garden because it’s hands-on. One teacher noted “Kids love being outside in general. Hands-on is key: eating, sorting trash, etc. for taking messages beyond garden class.”

And there’s science happening in the garden. Students ask questions, observe and record change over time in their journals, and talk with their peers about what they find. Our interview data suggest that there are clear precursors to developing scientific habits of mind through the practice (doing) of science. The key to creating the opportunity for students to practice science in elementary school is in providing the space to do so. The garden or outdoor classroom is critical for free and equitable engagement in learning by all students. One teacher said, “Science in the garden provides an opportunity for my kids to be intrinsically motivated, it’s not top down but student led.” The type of learning that takes place is

kinesthetic and experiential and therefore relevant to students. Teachers said that students who feel less engaged in the traditional classroom often open up and become more assertive and engaged in the garden due to the hands-on activities that are possible in the space. You can get messy in the garden and this allows teachers to provide new, exciting, and perhaps materials-heavy and messy lessons for their students. The intersection of the space, the hands-on learning that takes place there, and the engagement that results are all necessary for the successful practice of science and the development of scientific habits of mind.

One teacher said, “EO has been really wonderful this last year, My group enjoyed it a lot, they are making connections to what they learned and applying it, including Social Emotional stuff, they are more gentle, have more empathy. More ability to do hands-on learning, more authentically connected to nature. This year we released ladybugs and butterflies, watched and heard bees, made butter, tasted honey. During the last week of school we did highlights from the year and almost everything was related to what we did with Andrea and in the garden. I am able to do science because of the foundation built in the garden.”

Significance:

This finding is significant for Education Outside because it helps us further define our Theory of Change regarding science learning outcomes and their precursors. It helps us define what is special about the garden in improving and supporting science learning outcomes and how our program utilizes and activates these spaces for learning. What is important here is not just that the garden is real and dynamic and therefore a place to provide hands-on learning, it’s that this finding sheds light on how we can best harness the power of these spaces to teach science. What science is BEST taught in the outdoor classroom? What content, concepts, and practices really come to life in the garden?

Response

Education Outside can use this finding to help us first acknowledge what it takes to develop science habits of mind or science skills: it takes the outdoor space and it takes hands-on lessons that appropriately harness the strengths of the garden space. For example, a focus on life and earth science is important, but we could also incorporate planting, harvesting, and eating produce into our science curriculum.

We should also contemplate the better use of signage or other ways of promoting learning in the garden. Signs that say “What do you see here?” or “What do you feel in this garden bed?” The visual environment should/could support Education Outside’s curriculum, mission, and instructor. We could also experiment with creating visuals for each school garden so it’s clear that you’re walking into an Education Outside garden and not another garden. It’s clear that we’re using the space to teach science.

Lastly, we could think more deeply about engaging our older 4th and 5th grade students in a project that is explicitly related to their K-3 experiences, but allows them to go a step further and take action at school and for the environment. For example, we could support 4th and/or 5th graders in pursuing an action project as part of their garden class time that requires them to use their science knowledge to do something for the planet: a school assembly on climate change or recycling, beach clean up and awareness campaign.

Finding 5: Food is an Engagement Strategy, Duh!

Description:

Our interview data suggests that food plays an important and perhaps critical role in shaping student experience and learning in the garden. Planting, harvesting, cooking, and eating food that is grown in the garden is often what is most remembered and exciting to students. One teacher noted, “food experiences are key: make pizza, they remember that. Growing, harvesting, and eating food makes a big impact.” And another teacher corroborated this by saying, “Food is important, eating is big” for her students. These experiences are often the most remembered. One teacher remarked that at the end of the year when she asked her students what their favorite part of kindergarten was, all of her students immediately said “eating X in the garden.” Cooking and eating engages all of the senses, a key content area of elementary science education. It’s directly relevant to students. We all eat, it’s fundamental to our being. And science is always present in the food we eat and how we cook it.

Significance:

This finding is significant for Education Outside as it forces us to acknowledge and more deeply explore the role food plays in our program and curriculum. Our program is focused on science and environmental literacy, but food could be a thread that connects these two things. The schools and students we serve are all part of a school district that has goals around wellness. Some of our schools, specifically, have interest in preventing obesity and promoting healthy lifestyles. Growing and cooking food in the garden could be the way in which we better connect to community needs around wellness, and we could do this through the lens of science.

Response:

Education Outside has not explicitly called-out “food” as a key ingredient in our work and this needs to be further examined. We should explore the role that food plays in our program and curriculum and on the impact we hope to have on our students, acknowledging that cooking experiences in the garden are potentially the most memorable we can offer. Education Outside should harness the power of food and cooking experiences to teach science. And we should articulate this connection explicitly in our messaging.

Education Outside should create a cooking curriculum that explains the science behind the recipe, so that students connect this immersive experience with real science knowledge. In effect, we need to harness the power of food to teach science. Perhaps we could partner with someone like Kenji Lopez-Alt, the chef and author of *The Food Lab*, who is located in San Mateo. Or *Cook’s Illustrated*, which also focuses on the fundamental science behind cooking that is foundational to good food. Education Outside also has resources in the San Francisco community that we could tap to create such a curriculum and training. We currently have a “Cooking the Common Core” training that we provide to corps members, but we need to expand our offerings to include “Cooking the Next Generation Science Standards” or “Next Generation Cooking” in a play off of the new Next Generation Science Standards (NGSS) that have been adopted by the California Department of Education.

Finding 6: Back to Basics: Recycling and Composting

Description:

The data suggest that recycling and composting are important hands-on activities that have direct

impact on student's understanding of their role in preserving the environment. If part of Education Outside's hoped for outcomes are around environmental literacy and stewardship, then the data are suggesting that recycling and composting could be two ways of getting to those outcomes more easily. One teacher noted, "the recycling/composting [that happens at school] is hands-on and consistent and they remember these concepts because they do it all the time." Another teacher noted that her students are "more connected at a personal level" to the recycling and composting activities at school. Recycling and composting are both hands-on activities and are therefore similar in impact to experiences in the garden. One teacher said, "Hands-on is key: eating, sorting trash, etc. for taking messages beyond garden class."

Recycling and composting are happening across the schools we work with, due to district-level and City support. Our corps members can choose to support and engage in these activities or not. But, because of their hands-on nature, recycling and composting are two ways to build environmental literacy and provide a chance for students to take action to protect their environment, immediately and directly. Interview data suggest that we should not ignore the impact recycling and composting could have on the students we serve and find ways to incorporate these activities and concepts into our curriculum for older grades.

Significance:

This finding is important for Education Outside to consider. We started as a program that supported composting and recycling efforts in schools explicitly and then backed away as the corps position became more focused, rightfully, on teaching science. But, these efforts are where many teachers said there is a high degree of impact on students. Similar to our finding on food, this finding encourages us to explore ways to connect recycling and composting back to science education. By utilizing recycling and composting as vehicles for science education, EO instructors can engage directly in these efforts and make a difference at school immediately. The school district in which we work is also focused on recycling and composting. Connecting these activities to the science education we provide can further support the wider efforts happening across these schools.

This finding is also significant as the organization looks to expand its programming to sites beyond San Francisco. Would this piece of programming be as significant in other places that do not have municipal composting or an emphasis on recycling in schools? Is this an area of programming that we might develop further if we expand to other areas without city-wide supports due to its impact? On the other hand, since recycling and composting are hands-on activities rooted in scientific principles, better incorporating them into our programming could be a way to introduce these activities into other expansion areas.

Response:

Education Outside should reconsider its relationship as a program to the recycling and composting efforts at the schools. We should think about how we could better highlight the science of each of these activities as teachers unanimously mentioned these activities as having a clear impact on students. We may support these activities at school, but perhaps we can better incorporate them into our science curriculum.

Education Outside could consider a partnership with the US Green Building Council's program to support the hiring of Directors of Sustainability in large school districts across the country. Districts that are already supporting recycling and composting could be more supportive of outdoor education and

efforts to support ecoliteracy at their schools.

Lastly, these efforts could support curriculum development for 4th and 5th graders who are ready to engage and take action. We could incorporate action projects related to recycling and composting into our curriculum for these grades.

Finding 7: In it Together: Collaboration between Corps Members and Teachers

Description:

The data suggests that the collaboration that can occur between teachers and corps members in teaching hands-on science in the garden is critical for making sure science is actually taught at the elementary level. Corps members who collaborate with teachers on strategies for engaging students in a hands-on science lesson increases the probability that science lessons will actually be taught. One teacher said that the “corps member brings new ideas and skills and enthusiasm for science and teaching” and this has inspired her own practice. Another teacher commented that the Education Outside program understands “that teachers [aren’t often] able to do all of the prep [necessary for a truly hands-on science lesson], so collaboration with the corps member makes these hands-on lessons happen.” And another teacher confirmed, “Garden built foundation for doing this work. I wouldn’t have been able to do science on my own! All of the materials in the garden, we look at all of this closely, using magnifying lenses and have a chance to look deeply.”

The garden provides the ideal stage for deep exploration, but it requires a special preparation and time. Corps member collaboration with teachers makes this possible.

Significance:

This finding is significant because it explicitly highlights the unique and important role that corps members play in science education at school sites. Many of our most challenged schools said that science would not be taught if it wasn’t for the corps member. This finding underscores the need in many districts (as defined in the Lawrence Hall of Science’s 2011 report on the state of elementary science education in California) for high quality science education and teacher training at the elementary level. Our corps members come prepared to teach outside and have the skills to lead science lessons in a hands-on fashion. This finding is showing us that the role of collaborator in itself is key to our science outcomes.

Response:

Education Outside should create and provide a specific training for corps members on collaborating with teachers which includes framing on why is this important and the way collaboration affects our outcomes related to science learning. This training could incorporate role playing and more clearly define options for corps members based on the level of collaboration the school needs: less challenged school vs a more challenged school. Education Outside could do a six-week training block on community building and collaborating for collective impact.

4. Conclusions

Education Outside’s participation in the Project Impact research process has helped us gain insight into

the nuances of our intended impact on students and the precursors to that impact that light the way to our outcomes. This insight will not only help us better articulate what we do, but it will help us be better at doing it. Education Outside had never collected qualitative data in this fashion previously. Teacher interviews yielded rich information as well as very clear themes across very different schools, as highlighted in the findings section of this report. The themes that emerged through our qualitative interviews revealed very interesting findings and has pushed us to think about our program’s impact in different ways. We’ve realized that perhaps some of the experiences in the garden that we have seen as wonderful byproducts of our work (taking risks, taking care of something) might actually be at the heart of our impact.

In 2013, Education Outside kicked off a multi-year evaluation that yielded important information about our program and helped us create our first Theory of Change. The Project Impact process, however, is the most educative evaluation process that we’ve experienced. We not only learned more about our program’s potential impact, but we learned the fundamentals about what evaluation is and for. This will only further our current efforts to better understand and articulate our program’s intended impact on the communities we serve.

5. Next Steps

As a set of next steps from the Project Impact process we intend to:

1. Share this report and findings with our staff, board, and corps members.
2. Update our interview protocol based on lessons learned from our first round of interviews and conduct a larger set of interviews in the 2017-2018 school year to see if our findings persist and if new themes emerge.
3. Use the Project Impact findings to inform the creation of a new pre and post student survey that can be used on an annual basis to determine programmatic impact.
4. Articulate our intended impact and the precursors to those impacts to our constituents (school communities, district leaders, funders, and colleagues) through updated communications tools.

6. Appendix

Indicators of impact

Impact #1 –

1. **Students develop an understanding of their relationship with their local environment**

E3 (Quantitative Indicators of Impact)	E4 (Qualitative Indicators of Impact)
<p data-bbox="181 1671 769 1724"><i>As a result of your program, what do people know now that they didn't know before?</i></p> <p data-bbox="181 1730 282 1757">KNOW:</p> <ul style="list-style-type: none"> <li data-bbox="181 1766 732 1829">-students know that they live on a planet that supports them <li data-bbox="181 1837 792 1896">-students recognize the plants, animals and abiotic elements of environment 	<p data-bbox="821 1671 1403 1724"><i>As a result of your program, what might people now believe that they didn't believe before about themselves or others?</i></p> <p data-bbox="821 1730 932 1757">BELIEVE:</p> <ul style="list-style-type: none"> <li data-bbox="821 1766 1247 1793">-they are part of a larger ecosystem <li data-bbox="821 1801 1313 1829">-the earth and natural world are valuable

<p><i>What can people do now that they couldn't do before?</i></p> <p>DO:</p> <ul style="list-style-type: none"> -plant & dig in the the garden -build infrastructure -observe animals and changes over time -play in natural spaces in addition to built spaces <p><i>How do people feel now that they didn't feel before?</i></p> <p>FEEL:</p> <ul style="list-style-type: none"> -students are excited to be in their environment or natural world 	<p><i>How have they become different?</i></p> <p>BECOME:</p> <ul style="list-style-type: none"> -develop sense of awe and wonder about their home environment -nurturer of environment -identify with being an “outdoor person” <p><i>What do they love (committed, dedicated, persevere)?</i></p> <p>LOVE:</p> <ul style="list-style-type: none"> -sense of belonging in their ecosystem, -love being outside (ex: committed to going outside)
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Impact #2 –

1. Students develop scientific habits of mind.

<p>E3 (Quantitative Indicators of Impact)</p> <p>Know:</p> <ul style="list-style-type: none"> -students know how to take their observations and ask a scientific question -Students know how to gather information in the garden, evaluate its meaning, and communicate about it with each other -students know how to analyze information that they gather in the garden and form interpretations -students engage in discourse with each other about their findings and interpretations -student know that logical arguments are constructed from evidence, science evolves due to evidence, research is used to construct explanations -That curiosity is central to building knowledge -That curiosity is a good thing <p>Do:</p> <ul style="list-style-type: none"> -ask questions, construct explanations, obtain, communicate, and interpret data, engage in argument from evidence, and other NGSS practices -discover new things <p>Feel:</p>	<p>E4 (Qualitative Indicators of Impact)</p> <p>Believe:</p> <ul style="list-style-type: none"> -they have the ability to construct explanations, make their own decisions based on research, articulate their own data or opinions -that curiosity is key to science <p>Become:</p> <ul style="list-style-type: none"> -able to evaluate other people’s arguments/evidence (critically consume information) -Develop a practice of ‘beginner’s mind’ -identify as a scientist -become a lifelong learner <p>Love:</p> <ul style="list-style-type: none"> -dedicated to engaging with the world with an evidence-based approach -passion about exploring phenomena (seeking answers)
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<ul style="list-style-type: none"> -increased competence, confidence, resilience, agency -enthusiastic about questioning -unafraid of engaging with new material (over the fear of worms) 	
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Impact #3 –

1. Students develop empathy for and protect their local environment.

<p>E3 (Quantitative Indicators of Impact)</p> <p>Know: -students are aware that their actions have impacts</p> <p>Do: -take ownership of the garden (take steps to care for garden regularly), care for living things</p> <p>Feel: -increased compassion or inspiration; increased sense of responsibility, enthusiasm</p>	<p>E4 (Qualitative Indicators of Impact)</p> <p>Believe: -they can make a difference or positive change</p> <p>Become: -stewards, stewardship advocates, caretakers</p> <p>Love: -committed the act of stewardship; dedication to taking care of the environment</p>
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Principles of Change

Critical features of your program, initiative, or strategies	The theory or principle behind the feature of your approach
We hire, train and place passionate instructors in schools via national service	Schools are understaffed and we provide a needed burst of energy and passion through full-time service which benefits students because they see a passionate and positive adult that that they can trust and learn from everyday at school.
We teach hand-on science outside that is focused on the nature of science, not content, allowing room for multiple learning modalities	The NGSS emphasize hands-on learning and we seize the opportunity that the garden provides to bring these standards to life for students in a hands-on, experiential way (making room for diverse learning styles).
We meet schools where they are; we match hiring, provide flexible scheduling and curriculum, adjust to a particular language of instruction, provide extra programming	Due to the nature of public education, our program remains flexible to the needs of our schools and this allows us to reach more students.
We teach every student in the school and provide everyday integration of program for	Students who may not have the opportunity to connect to the natural world or practice science do

students	so everyday at school.
We harness the schoolyard for discovery and instruction at an age appropriate time	Much of elementary science should be taught outside. If there's a garden, students can plant seeds in the ground instead of cups on the windowsill.
We work with every student and teacher; we're deeply ingrained in the school, engaging the entire community	We are onsite everyday building relationships that are critical for the maintenance and sustainability of the program. Students benefit from the consistency of having an educator on site everyday, versus one week out of the school year like they might experience at an off-site environmental program.
We build outdoor classrooms and create new learning spaces that are functional	Schools need support in developing these spaces in order to make them come to life in support of student learning. We provide this support to schools.
We provide intensive supervision and coaching for our corps members	As instructors in schools, our corps members draw from the lessons learned and practices developed in formal education so that they can serve the needs of their school communities and students in an informed fashion. Corps members and schools share the same language which is key to being effective at what we do.
We create a professional learning community among our corps members through the cohort model and training	We place corps members in a geographically close area so that they can see each other frequently and have a shared experience. This helps corps members better serve their communities.
We are public-school based and therefore ensure equitable access to the natural world	Public schools reach a large portion of the most underserved children in the nation, by working in public schools we're reaching the population that also has the least access to the natural world and quality science instruction.

Qualitative Interview Protocol

Connection Questions:

1. (Connection, Know → Believe) Students recognize biotic/abiotic elements >> believe that they live on a living planet, that they are part of a larger system
 - a. What changes have you seen in your students' abilities to recognize the plants and animals in the garden since participating in the Education Outside classes? >>How has your students' relationships to nature changed as a result of their experience in the garden?
2. (Connection, Do → Become) Play in the natural environment, observe change over time >> sense of awe and wonder, sense of self as an outdoor person
 - a. What changes have you observed in how students engage with the natural world since participating in Education Outside? >> How is this helping students become more at home in the natural environment/outside?
3. (Connection, Feel → Love) Students are excited to go/be outside >> sense of belonging outside
 - a. In what ways are your students more excited about being outside since participating in Education Outside? >> How are they communicating or sharing this excitement with others? → How has this helped them become more passionate about the outdoors and

more passionate about learning?

Stewardship Questions:

1. (Stewardship Know -> Believe) Students know their actions have impact >> believe they can make a difference
 - a. What do you think your students have learned about the impact of their actions on the environment since participating in EO classes outside? What were you still hoping they'd learn that they haven't yet? >> How has this changed their beliefs about their role in impacting the environment?
2. (Stewardship Do → Become) Care for the natural environment >> stewards, caretakers, some who values taking care of the environment
 - a. How are the students showing care towards their environment since participating in EO classes outside?>> In what ways do you think the students are becoming stewards/protectors of the environment?
3. (Stewardship, Feel → Love) Compassion, responsibility, enthusiasm >> dedication, committed to caretaking
 - a. What changes have you noticed in your students' levels of compassion or responsibility when they talk about the environment since participating in EO classes outside? >> How do you think this has translated to their lives beyond the classroom? (Ex: home or family life) → How has this made them more committed to caring for and protecting the natural world/outdoors?

Science Habits of Mind Questions:

1. (Science habits of mind, Know -> Believe) Students know that being curious and asking questions is a good thing >> believe that curiosity is key to science
 - a. How do your students recognize the value of curiosity (or asking questions) differently since coming to Education Outside classes? >> In what ways do you think the students embrace curiosity (or asking questions) now more than they used to?
2. (Science habits of mind, Do → Become) Engage in science practices >> identify as a scientist
 - a. How have your students practiced science in the garden? What about science practices continues to be difficult for them to do?>> How has this helped your students change their orientation towards science?
3. (Science habits of mind Feel → Love) Increased confidence and competence, unafraid to explore >> dedicated to engaging with the world...
 - a. In what ways have you noticed that students are more confident about exploring outside in the garden? >> How might this signal a deeper level of dedication for exploring in other areas of their life?

Quantitative Questionnaire

Science Habits of Mind:

As a result of participating in the Education Outside program:
My students feel _____ about asking questions in the garden.
My students feel _____ about engaging with their peers about their observations or findings in the garden.

My students feel _____ about constructing explanations in the garden.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
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Stewardship:

As a result of participating in the Education Outside program:

My students understand that their actions impact the environment.
My students show more empathy towards living things in the garden.
My students are excited about caring for the environment.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
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Connection to Nature:

As a result of participating in the Education Outside program:

My students better understand that they live on a planet that supports them and other life.
My students better recognize specific elements in their environment such as plants, animals, rocks, and soil.
My students are more connected to the environment, including nature.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
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