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Impact Evaluation Plan and Logic Model
NatureBridge Final Report

Evaluation and Training Institute
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NatureBridge
Connecting Youth to the Natural World™

Contents

Introduction

Through its mission to inspire personal connections to the natural world and responsible actions to sustain it, NatureBridge has been providing environmental and field science education opportunities for over 40 years, reaching more than a million youth at five locations: Yosemite, Golden Gate, Olympic, Santa Monica, and Channel Islands. Building on the solid foundation of its Core Educational Framework, NatureBridge implements numerous programs for students, teachers, and communities to deliver environmental education aimed at developing a sense of place, identifying interconnections, and encouraging stewardship.

Instructional three-to-five day residential field science education programs are tailored to meet the developmental, educational, and cultural backgrounds of students, as well as the curricular focus and program objectives as specified by classroom teachers. Using a combination of external and internal evaluations, NatureBridge has been evaluating its educational framework and programs against their mission for over a decade. By continuing to evaluate, improve, and expand its programs, NatureBridge seeks to educate the next generation of leaders to respect the natural world, understand the scientific principles that govern it, and preserve it for future generations.

With field science instructional groups providing such an opportunity for diverse experiences across several campuses in different geographic areas, NatureBridge wanted to better understand and document what positive impacts their program has on visiting students. Toward that end, NatureBridge contracted with the Evaluation & Training Institute (ETI) to develop an impact evaluation plan that would lay the groundwork for substantive study of the organization's effects on their target audience. This is the first step to provide information that can be used to highlight NatureBridge's impacts for current and potential funders, increase internal understanding of the program's potential, market the program to schools, and share resulting insights with members of the environmental education community, among other uses.

Given the complexity of the NatureBridge program model, we have been working in collaboration with NatureBridge to ensure that our efforts continue to align with the needs of the organization. This document contains revised versions of previously submitted documents (logic model, literature review) that incorporate feedback from the NatureBridge leadership and the Education Advisory Council as well as our proposed **Impact Evaluation Plan** for conducting a cross-campus evaluation. A companion document (**NatureBridge Formative Evaluation Plan: ADR Cycle and Program Alignment**) outlines a formative evaluation plan to measure program alignment to improve the delivery of high-quality field science content.

The current document is divided into several sections that provide a supportive base for the impact evaluation:

The **Logic Model Narrative** outlines our process for developing a program-wide logic model and the **Program Logic Model** contains our final version of the graphic model. A logic model is a crucial first step in outcomes-based evaluation planning, and this logic model served as a blueprint for our overarching impact evaluation design, providing a

foundation for research methodology and effective measures that are aligned to program content and objectives.

The second section contains our **Literature Review**. Through a review of published approaches to evaluating similar programs, the literature review provides a contextual basis for our logic model and presented a pathway for moving forward as we developed the methodological approach and sample instruments for a summative evaluation plan.

The **Impact Evaluation Plan** synthesizes our work into an actionable evaluation approach to assess the extent to which student outcomes are met and sustained by NatureBridge programming. It contains an overall evaluation design, methodological framework, and an **Evaluation Toolkit** with proposed sample instruments. This plan can be used to guide an external evaluator or support internal monitoring of program outcomes for program improvement purposes.

Finally, the **Evaluation Toolkit** provides examples of all measurements outlined in the Impact Evaluation Plan including student and teacher surveys, content map protocols, journaling prompts, and authentic tasks to measure science processes.

As with all other documents that we have submitted thus far, this is intended to serve as the basis for discussion with NatureBridge and we look forward to feedback.

Logic Model Narrative

NatureBridge's educational programming is unique in that it is tailored to the specific needs of the teachers and students who participate in each program, incorporates a variety of content and instructional strategies aimed at engaging students, relies on the use of multiple learning styles, and is built around individualized learning goals. Even more, educational programs at NatureBridge encompass a breadth and depth of content areas that include: ecology, geology, earth science, life science, marine science, physical science, scientific processes and inquiry, cultural history, and climate change, as well as site specific ecological and environmental content. Given the number and complex network of these field science programs, a comprehensive and well-thought out logic model can provide coherence across NatureBridge's multiple programs, multifaceted tasks, and diverse environments.

Logic Model Development Process

The Core Educational Framework (CEF) served as the initial framework for our program logic model. As a detailed theory of change, it helped orient us to the broad intended program outcomes and program resources for NatureBridge's field science programs. Understanding that the CEF is highly theoretical, and through discussions with NatureBridge staff, it was clear that our job was to develop a "working logic model" that most practically aligns to what is happening at the ground level and can serve as a blueprint for practical and targeted evaluation across campuses. Toward this end, we took a grounded theory approach to developing a logic model that most accurately reflects our view of program implementation at the ground level.

In addition to reviewing NatureBridge's educational materials and program documentation, we conducted brief informal phone interviews with education leadership members representing each NatureBridge campus, including all Education Directors and Managers. Along with obtaining feedback on our baseline logic model (based on the CEF), we were able to get further information on how each campus designs programs to meet the needs of diverse groups, how campuses address the three core educational framework themes, the extent to which science content is embedded in program activities, the relative emphasis on each program outcome, and other important insights.

To witness NatureBridge programs in action and further inform our logic model, we conducted observational visits at each of the five locations (Golden Gate, Santa Monica Mountains, Channel Islands, Yosemite). Our site visits gave us an excellent chance to think about how our conceptual vision of the field programs aligned with the practical site experience for students on campus. In addition, we kept in mind the next stage of the process, evaluation planning and instrumentation, and considered the practical applications of this phase as well during the site observations.

Using these three streams of data (program documents, interviews, site visits), we developed and submitted a revised draft of the logic model in graphic form in June 2012. We received feedback from NatureBridge leadership and the Education Advisory Council that we have incorporated in the current iteration of the logic model (see **Logic Model**, page 10). As part of our process, we have documented changes, insights, and thought processes behind our logic model development. We have synthesized these

ideas (drawn from process reports to NB as well as internal notes and discussions) and present them by logic model component.

Environment/Problem

The environment component describes the problems or needs that program is attempting to resolve. The context that gave rise to NatureBridge consists of several challenges. Many young people have lost touch with the natural world and they are being educated in a system that does little to encourage environmental awareness and stewardship. In these challenging economic times, schools and teachers are struggling through budget cuts and layoffs and are working with limited resources to teach science and environmental stewardship.

Inputs/Resources

Inputs are the human, financial, organizational, structural, and/or community resources that are invested to support and implement a program. Beginning with the resources outlined in the CEF, we identified several elements that sustain NatureBridge including student participants, NatureBridge field educators and program staff, classroom teachers and adult chaperones, institute capacities, and the program design process.

The CEF recognizes that NatureBridge educators will shape students' experiences through several factors, including, but not limited to, their varying levels of experience, their background, and their teaching beliefs. Likewise, student participants come to NatureBridge with unique backgrounds, diverse experiences, various levels of knowledge, and differing levels of comfort with the outdoors. The CEF also includes the variation in institute capacities as an input as each site has different physical environments, seasonal climates, and institutional histories.

During our site observations, we saw the very real diversity of programming and began to understand how programs are created and customized for each visiting school group. Prior to our site visits we were not aware of the pre-trip planning process between NatureBridge and teacher contacts (in most cases) from the visiting school or program. To account for this input and communication, we included a Program Design input in our logic model to account for the fact that a school representative can choose the focus of the program based on standards, curriculum, personal preference, etc. These preferences are captured in the pre-trip planning questionnaire submitted by groups before they participate in the program. In addition, the Program Design input includes other factors that would influence the design (i.e., state standards, curriculum focus, length of stay). Feedback from the Educational Advisory Council pointed to an additional potential factor that may influence student outcomes: pre- and post-trip classroom content.

We made a second addition with our logic model: adult chaperones. In our first observation at the Golden Gate site, we noticed that chaperones had the potential to shape the experience. For example, during an earth science lesson we observed on plate tectonics, a student wanted to know how we can be sure there is a core in the earth. When the educator hesitated, a parent chaperone described sound waves in terms the kids could understand. While hiking in the Santa Monica Mountains, a chaperone with a degree in botany did an impromptu lesson on plant morphology using

a native species. We have included Adult Chaperones in conjunction with classroom teachers to recognize that adult background, knowledge, personality, and leadership style have the potential to shape the experience of the group.

Finally, we revised the input of the classroom teacher. As defined in the CEF, the classroom teacher input includes the teacher's philosophy, background, and educational goals. While these are important, we thought that they would be reflected in the program design input and considered the more individual role that the teacher might play. We included such factors as the classroom teacher's comfort level in the outdoors and awareness of environmental issues.

Activity Constructs

Logic models typically include the activities – or services, processes, tools, events, technology, and actions— that are provided by a program. However, because NatureBridge activities vary widely across and within campuses and are dependent on instructor, institute capabilities, weather, and program design as requested by the classroom teacher, we have classified activities in Activity Modes. In addition to being generalizable across campus sites, the activity modes indicate specific outcomes for measurement that we used in developing our evaluation framework.

We have identified five key activity modes: debriefing/reflective, physically challenging, team-building, science-based, and stewardship. These activity modes are not mutually exclusive; one activity can incorporate multiple activity modes. For example, a student can learn about the geologic events that resulted in a particular peak formation after or while completing a demanding hike.

Debriefing/reflective activities encourage introspection during the NatureBridge experience. They may occur with others, such a group debriefing after a team-building activity, or they may be solitary experiences, such as journaling, sketching, or taking a quiet moment of contemplation. **Physically challenging** tasks offer appropriate challenges that are indicative of students' developmental and experience levels. **Team-building** activities consist of team problem solving or tasks that are characterized by collaboration and/or cooperation. For example, hiking can be a team-building activity when students look after one another's welfare (e.g., pointing out secure handholds while bouldering, warning of dangers like poison oak). **Stewardship activities** include those that promote environmentally responsible behaviors and or environmental knowledge at campus sites or beyond NatureBridge. Stewardship can consist of active hands-on activities (e.g., garbology) or facilitated instruction by educators (e.g, Leave No Trace principles).

Science-based activities were included only as an outcome in the CEF and we added them to our logic model as an activity mode. Scientific activities facilitate the transfer of factual information about the specific features of a place (e.g., informal lectures during a hike, student inquiry around a discovery touch tank) and also include information that is generated from the use of scientific processes (e.g., field-based data collection, observation).

Program Outcomes

Outcomes, as defined in a logic model, are specific anticipated changes in program participants' behavior, knowledge, skills, and/or attitudes as a result of program exposure. We identified four key program outcomes in the logic model: **personal growth and development, holistic appreciation of place, scientific knowledge and discovery, and responsible environmental behavior**. In addition, the model shows the linkages between activity modes and specific outcomes. For example, we predict that team-building activities would have an impact on participants' personal and social development. We also provide specific indicators for each outcome that will be developed into measurement items for our evaluation framework.

The CEF's use of the terms "improve" or "increase" in the outcomes dictates the research design method (i.e., administer pre-tests to establish a baseline and post-tests to indicate change). However, as discussed in our literature review, pre-post results might not reveal growth since participants can be overly confident in their responses on pre-surveys. This is particularly true in the area of environmental education. Currently we have used the term "demonstrates" in our outcome indicators to leave open the possibility of other measurement strategies, such as creating a set of criteria or rubric for observable behavior.

The discussion below includes a broad definition of each of our outcome categories. It also highlights the activity constructs that most directly feed into these outcomes and includes any additional challenges, insights, or next steps.

Personal growth and development

The CEF included two categories for personal growth and development, one for personal growth and one for interpersonal. In order to streamline the logic model and in keeping with our observations of the program, we have combined the two. Through both structured and unstructured activities, we have observed that NatureBridge programming can serve as a powerful conduit for personal growth. In addition, by the very nature of the program (residential, full of new experiences), we would anticipate interpersonal growth among students who share these experiences. This outcome would rely on structured and unstructured activities and would be most directly related to the **debriefing/reflective, physically challenging, and team-building** activity modes.

Holistic appreciation of place

While it is our goal to document the tangible experience of NatureBridge's field science programming with as much specificity as possible, we consistently observed, through direct instruction as well as more experiential learning, learning moments that encouraged students' holistic appreciation of their immediate surroundings. In an effort to capture what seemed like a vital element of the program we added holistic appreciation of place to the outcomes section. In the CEF it was included as a program lens, however, we felt that treating it as an outcome would allow us to more fully document the rich experience of NatureBridge in all its facets from the more academic to the more subtle and/or personal. In direct instruction, students could be encouraged to appreciate the place through information or mini-lectures about the civic or natural history of a place. We observed this at Yosemite when students were told about the history of Yosemite as a national park. On the other end of the spectrum, students might also be encouraged to experience a place by taking a moment of silence to observe their

surroundings or choose to do so on their own. Students may arrive at NatureBridge with little exposure to the natural world and as a result of diverse program activities (e.g., debriefing/reflection, physical challenges, teambuilding, science-based, stewardship) we could expect to see positive attitudes increase toward national parks, protected areas, or nature in general. We could also anticipate increased comfort in the outdoors as a result of the experience overall. As depicted in our logic model, this outcome has a direct correlation with all activity constructs.

Scientific knowledge and discovery

With the diversity of programming and content across NatureBridge sites, it has been a challenge to develop an effective approach to assessing scientific knowledge gains. We have observed science learning across sites, but the content has been very diversified (based on the inputs described above). In order to capture this learning, we have broadened the outcome category to include both scientific knowledge and scientific discovery. This outcome category therefore, includes both knowledge as well as attitudes toward learning since it seems likely that the unique experience of learning in this setting would encourage a willingness to explore and learn. In addition, we have identified several broad knowledge constructs as a starting point for assessing knowledge. These include, vegetation, animals, and geological features specific to the area. The scientific discovery and knowledge category also includes field science practices and other scientific methods. We paid particular attention to this outcome category in our literature review and have a detailed discussion below.

Responsible environmental behavior

The stewardship related activities we saw ranged widely across campuses. For example, at the Golden Gate campus “Garbology” and food waste reduction was a big focus. At Yosemite, some of the programming was dedicated to outdoor safety issues including bear safety and rock fall safety. In addition, the groups we observed learned trail etiquette and leave no trace principles. We have combined all of these different types of stewardship activities to develop a set of behavior and attitude indicators. Like scientific knowledge and discovery, this outcome presents a challenge to assess since the content varies widely across campuses and may be dictated in part by the specific outdoor features of each campus (e.g. threat of rock fall at Yosemite).

Ultimate Impact

The ultimate impact is the fundamental intended change that occurs in social, economic, civic, and/or environmental conditions as a result of program activities. An ultimate impact is not measurable but reflects an overarching program or organizational goal. In this case, we used NatureBridge’s mission statement as our ultimate impact.

Connection to the Impact Evaluation Plan

The logic model that we have developed serves as an anchor, guiding the development of our overarching research design, including underlying methodology, instrument design, and a detailed data analysis plan. Our next step was to review existing environmental education research literature to validate the four key outcomes that we specified in our logic model and to identify appropriate research methodologies and instruments.