NAAEE Research Symposium 2020:

Challenges in Implementing Science Learning Experiences in Outdoor Education Programs

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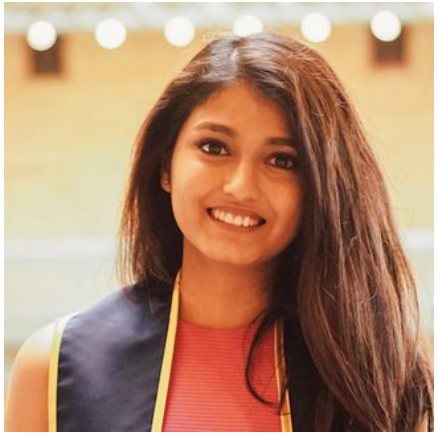
The BEETLES Research Team



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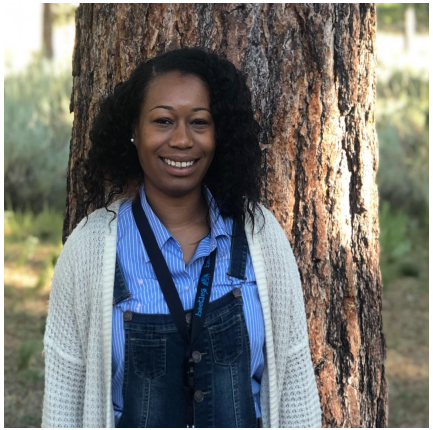

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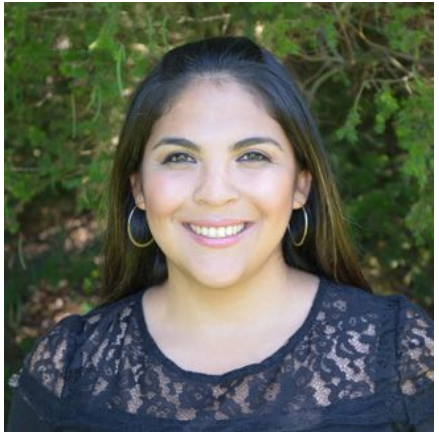
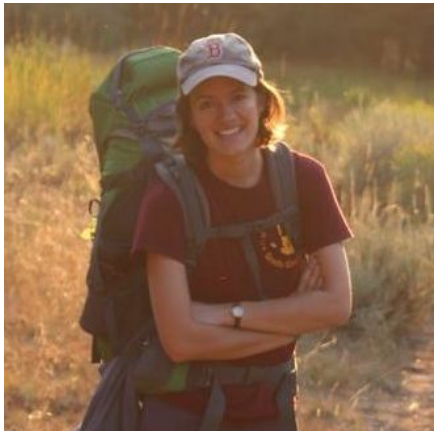


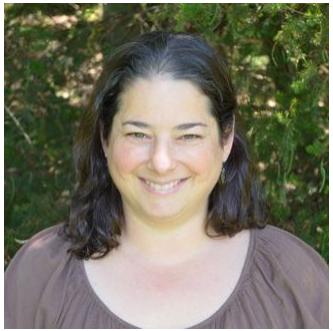
Valeria Romero



Melissa Collins

…and more of our team!

Vicky Laina



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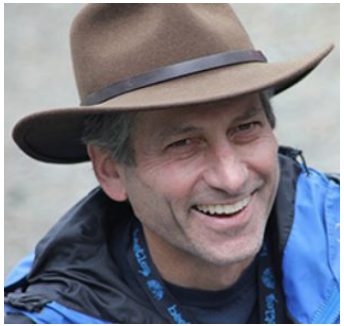

Craig Strang

Our Questions:

What challenges emerge in the implementation of high-quality student- and science-centered education in outdoor science learning experiences?

Where is the disconnect, if any, between research-based materials and resources, and the translation of those into practitioner practice?

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Context

Outdoor science education programs are rich environments for providing meaningful science experiences for learners.

While there is a growing demand for “evidence-based best practices” in numerous fields, there is relatively limited literature on challenges in implementing high-quality outdoor learning experiences in the field of outdoor science education specifically, and even less so on exploring those challenges in the context of the disconnects between research-based and professional-learning-developer-recommended practices and materials, and the practitioner experience.

While challenges may occur at many critical points in the pipeline--from awareness of professional learning materials and resources, all the way to in-the-moment challenges of instructor-led programming--this presentation focuses on the challenges that emerge in the uptake of research-based materials and resources and changes in practices at the programmatic level, even after leadership has expressed a commitment to programmatic change.

Our Study

This study is a collaboration with the Better Environmental Education, Teaching, Learning, Expertise Sharing (BEETLES) initiative on a 5-year, NSF-funded project to disseminate and study the BEETLES professional learning model for outdoor science programs (OSPs).

The BEETLES professional learning model consists of leadership institutes, professional learning (PL) sessions, exemplary student activities, and other tools and resources to support instructional improvement and programmatic capacity building in OSPs.

The accompanying research study has explored how programs were using the BEETLES materials and resources and what pedagogical practices were often used in these types of Outdoor Science Program (OSP) experiences.

In addition to the broader study across dozens of programs, we also conducted a case study of select OSP sites to gather more in-depth data on the programs. The research team used a purposeful sampling approach to identify eight program sites that represented a combination of residential and non-residential programs, with a range in staffing, learner demographics, geographic location, and size, among other features.

The sample for this study is derived from all the participating programs in Year 1 of the study, which included a total of 46 OSPs. This also included the 8 sites that served as case studies for a deeper dive into OSP experiences and perspectives.

As we were studying programs' use of BEETLES materials and resources, we started to notice some patterns in which materials were being used and how.

We also noticed that some common challenges arose in our conversations with program leaders and educators, and in our observations of outdoor ed programs in action.

These pointed to a number of points of tension or disconnect in the translation of research-based materials into practitioner's practice in outdoor science programs.

This presentation highlights a few of the most salient challenges that have emerged.

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Issues of stakeholdership in the process of change

Although 89% of all OSP program leaders indicated that their instructional staff were receptive or very receptive to BEETLES materials and resources (which emphasize student-centered, science-centered, inquiry-based learning experiences), we found varying levels of this receptiveness in actual practice.

Observations at some sites highlighted the emerging theme of the educators seemingly not being strong stakeholders in the process that encourages their professional development and the re-design of their instruction. The enthusiasm for change to suit best-practices was abundant in the program leaders, but that enthusiasm didn't always trickle down to their educators who directly interacted with learners (who had not been the direct recipients of the professional learning from BEETLES themselves), and thus may not see themselves as stakeholders in the process of changing their practices.

Practitioners and researchers: How do you get buy-in for change across all levels of an organization?

Desire for instructor autonomy

Another challenge that emerged was that of educators desiring more autonomy in their instructional choices, and program leaders and educators alike, finding research-prescribed practices and activities to be too rigid. Program Leaders indicated an interest in wanting their educators to have more flexibility in order to respect their experiences and expertise, and allow their educators to maintain some agency within their instruction. At the same time, activities vetted by research required a higher degree of fidelity in order to yield positive results, as it can be difficult to do high quality learning on the fly.

Researchers/curriculum developers: How do you develop high quality resources that provide flexibility for individual instructors?

Practitioners: How do you balance the need for high quality instruction with the desire to respect instructor expertise and autonomy?

Staff hiring structure and turnover

A key challenge that emerged as a recurring challenge for many OSPs was staff retention and high turnover. Many OSPs operate on seasonal cycles, and/or rely heavily on a combination of staff that is on a part-time, intern, or volunteer basis. As such, these factors were reported to be big limiting factors in that OSP leaders did not feel they were able to offer professional learning to pass on high quality resources and best-practices to their staff at a rate that accommodated for the high turnover in their staff. Consequently, it would appear that many of practitioners facilitating learner experiences were unable to train appropriately to deliver high-quality instruction to their audiences.

How might we balance the conflict between an organization's capacity to give PL time and the expectations of outcomes after PL experiences to improve practices?

Competing instructional goals

Our observations revealed that, in the face of competing goals, program leaders may feel compelled not to prioritize science learning. At one case site observation, the program prioritized place-based experiential learning, while another program prioritized socioemotional learning and teamwork. In both cases, programs' alternate goals steered program leaders away from implementing the research-based materials focused exclusively on science.

Another challenge around competing goals arises when audiences come to the program with their own goals. In two case study sites, school groups came to the program with very clear instructional goals articulated by the school leadership. In both cases, the OSP learner experiences were tightly constructed around those goals, often leading to a Sage-on-the-Stage approach to instruction. Having such rigid district expectations left the instructor feeling they must complete the checklist of learning goals, without a sense of agency in incorporating student-centered or inquiry-based instruction, as promoted by the research-based materials.

Researchers: How do we develop resources that are flexible to the competing priorities of programs and their audiences? Practitioners: Are goals intentionally forefronted in the selection of curricula/activities that educators choose to do? Do resources, as developed and available, meet those needs without modifications?

Limited time and adaptability of resources

One major challenge that was common to many OSPs: that of limited time and adaptability of resources. Practitioners indicate time (to plan for activities, provide and attend professional learning, and in-person time with their learners) as being severely limited, largely due to either lack of structural or financial support. In addition to limited time, practitioners also reported finding some resources (particularly student activities) to be cumbersome in adapting to their settings. Furthermore, they noted that program designers recommended sticking to the activity as designed for implementation with fidelity, which provided even less encouragement for practitioners to try new activities and ideas by modifying them to their perceived needs.

How can professional learning resources and student activities be designed to be flexible to meet the constraints of programs (largely time/money). If implementation of resources with fidelity is essential to their success, how can they be made flexible to the needs of these program leaders?

Discussion Questions

- What rings true to you in your experiences? What was most salient? What other challenges have you seen that we haven't yet captured?
- What sort of strategies have you seen that are helpful in addressing these challenges, if any?
- What sort of adjustments could be made on both sides? (give and take)

Practitioners: What sorts of resources would be helpful in addressing these challenges?

Researchers: What implications might these findings have for how we conceptualize research based PL resources?

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