MIND THE GAP

How Environmental Education Can Step Forward to Address the STEM Achievement Gap

Environmental Education is a broad field encompassing nature centers, school forests, outdoor education facilities, state and national parks among others. This diversity of organization type allows for wide engagement by the public and holds great potential for addressing achievement gaps in the formal education system.

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Environmental Education organizations have more power than they realize to affect change. For example, in Wisconsin, Environmental Education organizations employ over 3,100 educators, serve 1.1 million user days of education in the field, and represent over $40 million in direct economic activity. The collective impact of this industry is significant. We advocate for other states and regions to take a similar approach to quantifying the field in order to leverage support and ultimately, affect change. Part of addressing the STEM achievement gap will lay in making the environment an integral part of the approach, while yet another part of addressing this gap will be advanced by focusing the collective impact organizations to build capacity. The

work we will go on to describe here has proven valuable and eye opening- we also will lay out some of the steps to replicate this in other states. Doing so is a matter of environmental justice, a call to which many environmental organizations are responding.

Environmental Education to address STEM achievement gaps

Science, Technology, Engineering and Math (STEM) education does not have equal outcomes among different demographic groups. Racial disparity in science education is an issue nationwide. The 2015 NAEP science assessment noted statistically significant gaps in achievement for U.S. students that identified as black and Hispanic compared to those who identified as white (National Center for Education Statistics, 2015). As an example, Milwaukee, Wisconsin has the greatest STEM achievement gap in the country (Richards, 2016). Nationwide, schools that serve predominantly black and Hispanic students are

less likely to offer higher-level science courses (U.S. Department of Education, Office for Civil Rights, 2016). All of these facts demonstrate an educational system that fails students of color in STEM.

The pedagogical practices of environmental education have proven to be an accessible approach to science learning for youth of different backgrounds and is thus uniquely poised to address the STEM achievement gap. The field of environmental education encourages students to observe and connect with a place in order to learn. Dominant strategies for teaching include place-based education and an inquiry approach. Place-based education allows students to forge meaningful connections between STEM content, students' daily experiences and to observe the environment around them (Land & Zimmerman, 2015; Greenwood & Hougham, 2015). These field and inquiry-based approaches in STEM have better educational outcomes for low achieving youth (Blythe et al., 2015). Field experiences have also shown to increase confidence for underserved student populations (Hougham et al., 2018).

However, the field faces its own gaps of knowledge and historical bias. For the environmental education industry to effectively address the nation's STEM achievement gap, environmental education organizations must understand their position and progress in addressing issues related to diversity, equity and inclusion (DEI). This includes, but is not limited to, the increase of positive representation of minorities and other underrepresented groups, as well as teaching in a more culturally conscious and responsive manner. This paper will focus on Wisconsin, which faces some of the largest STEM education gaps, and how the lessons learned from a status and needs assessment and the work currently underway to address those findings could be applied to the nation.

Methodology

In the winter of 2015-16, a digital survey was distributed to environmental education organization leaders around the state

of Wisconsin. Our goal was to investigate the statewide status surrounding relevant topics within environmental education such as land management, professional development, visitation trends, budgets, diversity, equity and inclusion and identify organizational needs in these focus areas. In 2019, we updated and re-ran the survey, intending to update and improve our understanding of the status and needs of environmental education in Wisconsin. This article is focused on the enhanced component of the survey questions about diversity, equity and inclusion. Here, we present the set of questions from our 2019 DEI section of the survey to lay out our approach, and also to encourage the use of similar question sets in other states and regions.

The following questions were developed to address diversity, equity and inclusion in our field, defined in consultation with August Ball, Founder/CEO of Cream City Conservation & Consulting LLC. We understand the definition of diversity, equity, and inclusion and its meaning can take different forms. For the purpose of this survey we asked that respondents consider the following definition in their answers:
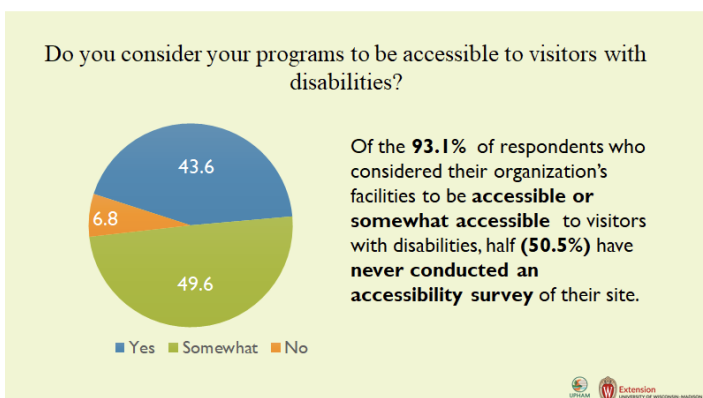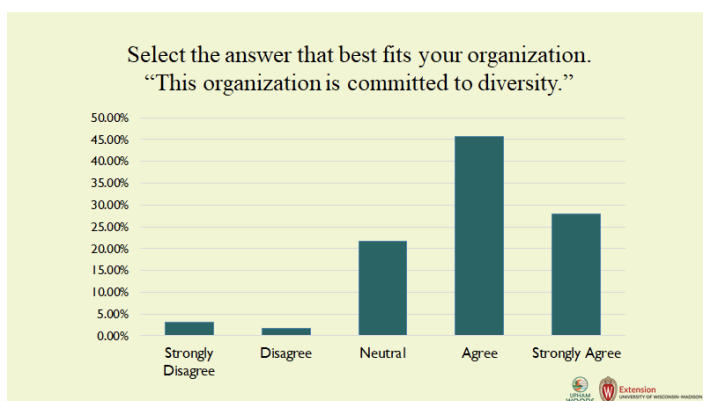
Diversity: Differences that make a difference.

Equity: A process of ensuring everyone has access to what they need to thrive.

Inclusion: Celebrating, welcoming and valuing differences.

1. Please estimate the percentage of groups that visit your site or programs that include at least one person with a known disability.

2. Please check all areas of training provided to your environmental education instructional/ program staff on working with persons with disabilities. How to adapt activities for participants with:

3. Do you consider your facility to be accessible to visitors with disabilities?

4. Do you consider your programs to be accessible to visitors with disabilities?

5. Have you conducted a physical accessibility survey of your site?

6. Does your curriculum or lesson plans include activity ideas for learners of varying abilities?

7. Do your curriculum or lesson plans include activity ideas for learners from different cultures or backgrounds?

8. What level of priority does your organization place on increasing program and facility accessibility at your site?

9. What level of priority does your organization place on increasing diversity, equity and inclusion at your site?

10. What is the estimated demographic distribution of your staff?

11. Select the answer that best fits your organization.
    11a. This organization is committed to diversity.

12. Please read the sentences and select the answer that best fits your organization. These questions were taken from the *Diversity Survey* (2014) by the Society for Human Resource Management.

12a. There is cultural and racial diversity among the people a job candidate will meet/see on their first visit to the organization.

12b. There is cultural and racial diversity among the people represented in our organization's marketing materials

12c. Employees from different backgrounds are encouraged to apply for higher positions.

13. Do you have resources and content available in other languages?

14. Does your organization provide trainings on diversity, equity, and inclusion?

Past iterations of this survey have had positive impacts for

Select the answer that best fits your organization.
"This organization is committed to diversity."

Does your organization provide trainings on diversity, equity, and inclusion?

Do you consider your programs to be accessible to visitors with disabilities?

Of the **93.1%** of respondents who considered their organization's facilities to be **accessible or somewhat accessible** to visitors with disabilities, half **(50.5%)** have **never conducted an accessibility survey** of their site.

Wisconsin environmental education organizations. Solid data is needed to inform decision – making and programming. The closer the data reflect the local context of the industry, the more effectively educators, administrators and our supporters can respond to current trends. However, collecting this data is only one step towards changing the status of the work on the ground.

Results

193 EE leaders representing 173 EE organizations completed the survey. We asked these leaders to describe their organization in a number of ways. For example, whether the organization correlates school program to academic standards (75.3% - Yes), if they considered their location an outdoor tourist destination (44.0% - Yes) and if they regularly partner with other regional or statewide EE organizations (59.5% - Yes).

Of the 93.1% of respondents who considered their organization's facilities to be accessible or somewhat accessible to visitors with disabilities, half (50.5%) have never conducted an accessibility survey of their site. The most common accessibility-related training that staff receive focus on physical disabilities (65.1%) and ways to encourage communication and interaction among all participants (50%).

Survey participants were asked which subject areas and organizational skills their staff would most benefit from additional training. Shown below are the most common responses:

Top EE Subjects Areas staff need
1. Using STEM as a context for EE (E-STEM)
2. Technology use in outdoor education
3. Understanding school initiatives, speaking school language
4. Community action/service learning
5. 'Sustainable design/green technologies or buildings' and 'Community-based learning'

Top Organizational Skills staff need
1. Diversity, equity and inclusion
2. Grant writing
3. Fundraising
4. Digital presence/website/Facebook/etc.
5. Volunteer management

Analysis: Perception vs Reality: the bubble around inclusion and environmental education

Solutions

The reported commitment by environmental organizations to DEI does not match the reported actions or steps they have taken towards DEI. For example, respondents from 56% of environmental organizations in the United States reported that trainings focused on diversity *should be* done (Taylor, 2014). In the Wisconsin status and needs assessment, only 50% of respondents reported actually conducting trainings related to diversity, equity and inclusion (Hougham et al., 2019). Even then, "The small body of empirical research that does exist about diversity trainings suggests that current practices are largely ineffective over the long-term. Therefore, it is imperative to conduct needs

assessments to determine what content should be done" (Beasley, 2017, p. 5). Spending time planning, executing and evaluating DEI trainings will be essential in moving this body of research forward and improving the professional development opportunities available to educators in the field.

At Upham Woods Outdoor Learning Center in Wisconsin, seasonal staff training includes a session on DEI. The session lasts approximately 5 hours and is spread out over 2 days. All levels of leadership were present - from the executive director to seasonal teaching naturalists - for a total of thirteen participants. Different levels of participation were encouraged; staff were given the opportunity to reflect individually and to participate in both small and large group discussions. The training used multiple forms of media including pictures, text, and videos in order to cite experts and incite discussion. Environmental justice framed the training so that our team could understand the larger picture and the role that environmental education could have on its participants. Environmental educators should empower learners to exercise their agency in creating better communities, which includes the environment in which those communities exist. More environmental organizations are embracing the focus on environmental justice in efforts to engage more diverse communities. For example, Camp ELSO (Experience Life Science Outdoors) in Portland, Oregon focuses programs on "grounding the youth experience in environmental justice while elevating

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the visibility and leadership opportunities for folks of color. " (Brown, 2019, p. 8). We looked at case studies that explore how environmental justice and environmental education intersect.

The training covered multiple topics such as the elements that make a space diverse, equity versus equality and how to respond to microaggressions as a bystander and as someone who experiences them directly. We talked about agency and how promoting others to exercise their agency creates more inclusive spaces. The training went beyond providing definitions and introductions to vocabulary words. Our staff discussed privilege and the role it has in addressing equity. We spent time talking about how access only approaches to broadening participation fails to hold dominant cultures accountable for the culturally exclusionary language that may exist within the programs they are providing access to (Bevan et ak., 2018). Participants then went through Upham's lesson plans and identified areas for improvement including how the lesson was framed and a critique of the content. This information was collected and will be used to improve our lessons.

We asked for feedback at the end of the training to help pus develop additional modules and activities for staff related to DEI during their contract. While staff training is an integral step towards inclusion, it cannot be the only time an organization supports discussions and activities focused on DEI. The goal of inclusivity needs to be reflected in an organization's policies, processes, paperwork and infrastructure. Continuous and intentional reflection of staff practices needs to become part of office culture. To create sustainable change we must confront a system that supports the oppression of certain communities and discontinue privileging privilege and focus on supporting those communities that have been historically neglected or oppressed.

For environmental educators, from a pedagogical standpoint, we must not only change what we teach, but be willing to change the ontological underpinnings in the transmission of knowledge. We must shift our role from experts sharing wisdom to members of a

learning community with the Earth. This is particularly true for white educators working with marginalized populations, as the dominant culture needs to listen and empower rather than tell and control. Without doing this groundwork in DEI training, we fall into the trap of treating empowerment as giving a voice to the voiceless, rather than listening to those who haven't been heard. We must shift the notion of DEI as a need to that of an asset, and be willing to use this knowledge to help others create the change we cannot imagine.

Freire (1970) supported the notion that we are moving regardless, and we are either moving to keep the dominant paradigm or to transform it. What better catalyst for change than our urban youth, who are already fueled by being marginalized? Emdin's (2009) research found, "These students eagerly await opportunities to exercise this power in the creation of a foreseeable new future that is different from an oppressive present" (p. 242). The first question we must ask ourselves is whether our organizations simply want to share what we are doing with diverse audiences or are we eager to embrace this new future as well?

Citations

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