Title of Assessment:

Needs Analysis: Examining Native Audiences in the New England Region of North America and how best to tailor STEM activity and create a community of trust for prolonged engagement

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Science Communication and outreach has the opportunity to go beyond the walls of informal learning institutions and take science directly to a community (Durant, et al. 2016). Looking at the disadvantaged communities within the United States, there are ample opportunities for engagement. For the purposes of this needs analysis, we will be looking at the American Indian and Alaskan Native community, which will hereon be referred to as AIAN, and the ways in which we might bring meaningful STEM engagement to them.

Who & Why:
As science communicators, it is important for us to not only reach self-selected science audiences but to push ourselves to move outside our comfort zone and engage with publics that may not see themselves as science-interested. Identifying potential audiences raises the question of not just whom we are reaching but why we are reaching them specifically. While there is an ongoing interest in raising the number of women and minorities in STEM, one minority that appears often overlooked is that of AIAN persons. Within the United States, there are only 2.9 million people who identify as AIAN which accounts for a mere 0.9% of the population (National Congress of American Indians, 2017). Within that number only 5% have achieved graduate and professional degrees, and only 9% have received bachelor degrees (ibid). Compared to the national averages, this is a much lower number and points to the need for an outreach and education intervention.

By the numbers in 2009, 48% of all United States 4th grade students were eligible for free and reduced price lunches, 68% of those were AIAN (National Center for Education Statistics, 2010). With 33% of AIAN children living in poverty (ibid), and scoring lower than their classmates in several areas and in multiple categories of achievement, it demonstrates that there is a clear lack of educational opportunity for this demographic. In STEM specifically, 2012 saw 35,360 STEM doctoral degrees awarded; however, only 0.3% were to AIAN (HE&IT, 2015). In areas like Public Health, AIAN, “die at higher rates than other Americans from… tuberculosis (600% higher), alcoholism (510% higher), [and] diabetes (189% higher),” (National Congress of American Indians, 2017). Additionally, in 2013, it was found that 40.1% of AIAN use tobacco, which is a higher usage rate than all other ethnic groups within the United States (U.S. Department of Health and Human Services, 2013).
All this is to say that for such a small minority in our nation, this group suffers from a lack of educational opportunity, of high rates of poverty, and a disproportionate number of health concerns; because of this, the AIAN people are my targeted group for outreach.

**Special Needs:**

Historically marginalized, the AIAN people would need more than anything, a person and group willing to listen, receive input, and who have the ability to take into account cultural concerns first and foremost. Ideally, we would like champions within the community that reflect the local cultural landscape in a similar way to the SciNation Near Peers (spectrUM, 2017). The needs of the community are a top line concern when designing engagement, and also when working to facilitate science dialogue that is tailor made to address their concerns in a culturally sensitive way.

While as science communicators we would like to come to the table with specific aims and objectives for a specific science subject, in this instance and with our objectives in mind, I feel the AIAN community should shape the science content as much as the STEM professionals do. Furthermore, this collaborative approach provides unique opportunity to completely tailor a learning experience that can lead to an empowered public (Mohr & Gibbs, 2013).

**Aims & Outcomes:**

The aims and objectives of creating a sustained engagement with the AIAN community of New England would be to:

1. Get more AIAN youth involved in STEM.
2. Educating AIAN youth and adults on STEM issues prevalent in their community.
3. Having a sustained presence of STEM professionals activating native community gatekeepers who help to develop appropriate activity for community youth.
4. Create an ongoing dialog between STEM professionals and the New England AIAN community.

By reaching AIAN youth in the K-12 range, we would ideally like to see more AIAN youth go into STEM related degree programs. Through sustained engagement we would like to gather a community of STEM professionals and AIAN community leaders who co-create content for youth engagement (Bultitude, 2011). This way there is a continuous relationship with the community that fosters a sense of trust and hopefully leads to more meaningful and deep engagement. A similar method of community building leading to long-term STEM engagement was created at the Centre for Brain Research (CBR) in New Zealand;
connecting Researchers, Clinicians, and the Community in a three-way dialog that led to deeper relationships between the scientists and the publics they were interacting with (France, Cridge, Fogg-Rogers, 2015).

**Other Activity:**
While there are other AIAN programs happening throughout the United States, (spectrUM Discovery Area, 2017; University of Arizona, 2017; Colorado State University, n.d.; SACNAS, 2017) there does not appear to be a program dedicated to this kind of engagement in the New England area. There is a local chapter of SACNAS (Society for the Advancement of Chicano/Hispanic and Native Americans in Science) at Harvard University (SACNAS Harvard Chapter, 2017), but most of their focus is on professional opportunities for students already in higher education. There is also an organization in the region called the United American Indians of New England (UAINE) who work towards addressing issues of Native oppression locally and nationally (UAINE, n.d.).

There were formerly two Native American schools in Maine (Indian Island School, Beatrice Rafferty School), however, both of the schools have no recent updates and appear to have been closed. While these sites are no longer available as dissemination points, they may yet provide collaboration opportunities. At the very least, they only further point to the fact that this is an identified community in need.

Beyond the local level there are national partners that may prove to be helpful in showing that this activity has precedence in other communities and can be successful. Most notably, the SciNation organization out of the University of Montana at Missoula has been working with the university museum and other local organizations to bring STEM to the local tribes for many years (spectrUM, 2017). Using this group as an example of how to engage native communities it is hoped that some of the locally identified organizations here in New England would become such a partner, or be able to act as a liaison to tribal community members who would be a best fit for this kind of role (Wellcome Trust, 2014).

**Literature:**
Some of the most applicable literature in this area is taken from working with disadvantaged or underserved minority groups in general and from research done in Pacific Islander/Native Hawaiian communities. Though not exactly the same as working with AIAN audiences, there are parallels that can be drawn between the different cultures/communities.

Appropriate points at which to start researching further are as follows:
Mode or Method:

While there are several areas of STEM that could be covered with an AIAN audience (health sciences, land and resource management), ultimately we would like to take our cues from the community and meet their science needs directly and through activities that they find appropriate.

Using an approach that encompasses the three different initiatives that make up public participation: public communication, public consultation, and public participation (Rowe & Frewer, 2005), a rounded out program would be developed. First, consultation with the public (AIAN people) to establish their needs in both STEM content and type of engagement; Second, communication to the public (AIAN and ally) by the engagement team to promote events; Third, AIAN participation in events.

Ideally we would rather have local Native STEM professionals, as minority representation is a key component to success in other similar programs of this scope (spectrUM Discovery Area, 2017; University of Arizona, 2017; Colorado State University, n.d.). And as per the
Wellcome Trust report, “engagement works best when a trusted and relevant champion is involved. This is particularly important for those disengaged from education, who can mistrust traditional authority figures such as teachers and people coming in from outside organizations” (Wellcome Trust, 2014).

This project would consider having an ongoing, evolving dialog with our audience as a key measure of success. While different modes and styles of communication provide varying levels of interaction (University of Edinburgh, 2016), for this specific audience who has so many factors to consider in order to present and deliver meaningful science content, we feel it is necessary to have multiple and recurring interactive experiences. Furthermore, “an effective science communicator is aware of the social, political, and cultural environment that surrounds the science that they are communication,” (Bray et. al. 2012). For these reasons, it is felt that a collaboration with AIAN leading the interaction and guiding our practice would be the most effective.

While it is recognized that different tribes within the region will require different cultural concessions to be made, it is hoped that by first tailoring a native-focused approach, it will make further customization easier. This tailoring of needs of the community through negotiation helps us to find what audiences want, and to narrow the content related to their particular area of expertise and interest (Gregory & Miller, 1998).

References:


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