INDIGENOUS STEM EDUCATION: PERSPECTIVES FROM PACIFIC ISLANDS, PACIFIC RIM, AND SOUTHEAST ASIA

Theme 1. Foundations for Learning at the Nexus of Culture, Language, Knowledge and Place

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Introduction

The seven articles contained in the first section of Indigenous STEM Education: Perspectives from Pacific Islands, Pacific Rim, and Southeast Asia, focus on “Foundations for Learning at the Nexus of Culture, Language, Knowledge and Place.” While these articles highlight current science, technology, engineering and mathematics initiatives drawn from the Pacific Rim, Pacific Islands and Southeast Asia region, their relevance is applicable to indigenous settings throughout the world. The intersect of indigenous knowledge and western science has emerged as a powerful focal point for educational reform over the past three decades, reshaping many realms in our understanding of the world around us. Inherent in the research reported here are the constructs of culture, language, knowledge and place as they form a foundation for indigenous educational advancement.

A refrain commonly heard in conversations among indigenous people is in reference to the challenges associated with “living in two worlds,” one being the locally-derived indigenous world with which they are intimately associated, and the other being the externally-defined world that has enveloped their existence. The tensions between these two worlds have been at the root of many of the problems that indigenous people’s have endured throughout the world for several centuries as the explorers, armies, traders, missionaries and teachers have imposed their world view and ways of living onto the people’s they have encountered in their quest for colonial domination.

In recent years, indigenous people have begun to reintegrate their own knowledge systems into local educational policies and practices as a foundation for connecting what students learn in school with life out of school. This process has sought to restore a traditional sense of place while at the same time broadening and deepening the educational experience for all students. Some of the strategies employed in this educational restoration effort include the role of local elders, traditional values, cultural camps, experiential learning, language immersion and cultural standards. The research topics described in the following articles serve as the basis for a pedagogy of place that shifts the emphasis from teaching about local culture to teaching through the culture to derive insights about the immediate places they inhabit and their connection to the larger world within which they are making a life for themselves.
As indigenous scholars reassert their world views, knowledge systems and ways of knowing in search of a proper balance between the “two worlds,” they offer insights into ways by which we can extend the scope of our educational systems to prepare all students to not only make a living, but to make a fulfilling and sustainable life for themselves. The articles presented here offer some rich examples of how the indigenous people’s of the South Pacific and SE Asia have established a rich research agenda of their own to begin to reconcile these tensions and accommodate the differences between their ways of life and those of their western neighbors. In so doing they are able to strengthen their voices and contribute to their own diverse cultural histories and traditions. At the same time they offer strategies for overcoming the tendencies toward replication of uniformity that are so deeply ingrained in the bureaucratic structures associated with colonization, and in the process institute a more locally-grounded, place-based approach that has the potential to integrate “the best of both worlds.”

One of the primary vehicles for promoting a pedagogy of place has been the development of indigenous research methodologies and political documents such as the United Nations Declaration on the Rights of Indigenous People’s that guide scholars into the use of the local environment and cultural resources as a foundation for all learning. A key incentive for such practices has been the sponsorship of STEM initiatives in which researchers work with resident elders to identify topics of local interest and develop projects illustrating the use of “science” in everyday life in the surrounding community and environment. The STEM themes contained in the enclosed articles have been drawn from accumulated knowledge derived from living on the landscape over many generations. Many of the research topics described in the articles provide intriguing opportunities for scholars to test the scientific principles imbedded in the local indigenous knowledge compendium.

The research topics described in the enclosed articles are a reflection of the indigenous view of the world as well as that of the collaborating scientists, incorporating both culturally accurate and scientifically valid principles and practices. This is a learning process in which the researchers and elders are all eager and willing participants, and we now have results that provide numerous examples of integrated science/culture themes that clearly illustrate the ways in which an extended period of experiential inquiry in a traditional environment can serve as the stepping stone and foundation that moves us toward in-depth understanding of the world around us.

One of the beneficial outcomes of the research described in these articles is the generation of locally-based STEM resources suitable for use in indigenous settings that can be made available throughout the world via technology. Access to these resources can be expanded to include materials in various thematic areas relevant to communities in the Pacific Islands and beyond. In documenting and sharing culturally relevant publications and educational materials such as those reflected in the enclosed articles we can reach beyond the surface features of indigenous cultural practices and illustrate the potential for comparative study of deep knowledge drawn from both the indigenous and western worlds.

The knowledge and skills derived from thousands of years of careful observation, scrutiny and survival in a complex ecosystem readily lends itself to the in-depth study of basic principles of biology, chemistry, physics and mathematics, particularly as they relate to areas such as botany,
geology, hydrology, meteorology, astronomy, physiology, anatomy, pharmacology, technology, engineering, ecology, topography, ornithology, fisheries and other applied fields. Such interdisciplinary research topics provide an instant relevance and can be used extensively in schools and community settings. It is the ready availability of these resources that provides educators the impetus to revamp their curricula and integrate the place-based approaches to education that have been championed through the STEM initiatives.

Another area in which culturally grounded STEM initiatives can impact school/curriculum interactions is in the use of technology to extend and deepen learning opportunities for indigenous students. As illustrated in the range of research topics described in the enclosed articles, collaborative research provides opportunities for scholars to focus on any aspect of their local culture/community/region and assemble the information in a multimedia format to be shared with the community through the use of technology. Cultural and place based research topics engage students in information gathering and compilation processes that simultaneously enhance learning of subject matter, technology applications and cultural knowledge, with the results often of direct interest and service to their communities.

The articles describing on-going research in the Pacific region illustrate how culturally relevant research has been developed by scholars from various indigenous contexts around the region. The results include life histories, genealogies, place names, language documentation, uses of local flora and fauna, subsistence practices, community histories, traditional arts and crafts, mapping projects and weather knowledge.

The primary thrust of the research described in the enclosed articles is to create a place for integrating indigenous knowledge in STEM education. The outcome of this research can best be summarized by the following statement taken from the introduction to the Alaska Standards for Culturally Responsive Schools, published by the Alaska Native Knowledge Network:

By shifting the focus in the curriculum from teaching/learning about cultural heritage as another subject to teaching/learning through the local culture as a foundation for all education, it is intended that all forms of knowledge, ways of knowing and world views be recognized as equally valid, adaptable and complementary to one another in mutually beneficial ways. (ANKN, 1998, p. 3)

While much remains yet to be done to fully achieve the intent of indigenous people in seeking a place for their knowledge and ways in the education of their children, they have succeeded in demonstrating the efficacy of an educational system that is grounded in the deep knowledge associated with a particular place, upon which a broader knowledge of the rest of the world can be built. This is a lesson about “living in two worlds” from which we can all learn.

References

Assembly of Alaska Native Educators