

Stewardship of the Land, Water and Ice: Implications for STEM Educational Opportunities In and Outside of the Classroom in Nunavik

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We, native people, have lived in our land since time immemorial. We know our lands, are experts in our environment. We do not study it for just a few years. It is a life time study. It is knowledge from the beginning passed on to us by our ancestors. We have knowledge, true knowledge, because it's our way of life.

Titi Kadluk, Chesterfield Inlet Cited in McDonald et al., 1997, p. 1)

Inuit Ways of Knowing and Western Science

... that expert knowledge is rarely valued as science or “recognized as a qualitative mode of inquiry, producing scientific evidence” (Pfeifer, 2018, p. 4).

...it is typically treated “as a source of **alternative interpretation** that is selected only when it can complement the more established Western research knowledge” (Pfeifer, 2018, p. 4).

-> We need new research practices and policies to **overcome capacity-building as a one-way street** ingrained deeply in a **credibility gap**, and further supported by **enduring colonial frameworks and practices**.

A Look at the Educational System in Place...

Tension between Education & Learning

Ongoing tension between **holistic worldview** where education is understood as being embedded in and emergent from family and community relationships, and the Western worldview and its **“adaptations of EuroCanadian schools to Inuit culture”** (Berger & Epp, 2006, p. 10) that still feels assimilation driven, incongruent with contemporary Inuit culture, and “in direct conflict with indigenous modes of transmitting knowledge across generations” (ibid, p. 11).

Tension for many youth between wanting to learn but not through formal education; tension and struggle to constantly navigate among epistemologies with a long history of colonisation

Grounding of Project: Inunnguiniq - Lifelong Learning



The iglu metaphor for child development and learning has become the symbol for K-12 education in Nunavut

... the child passes through stages of development in an ever-spiraling progression, accumulating one block at a time

... the iglu is a symbol of survival

... the caribou antler in the child's hand represents the important connection to the environment

... the environment has always supplied the natural resources required for success in the world

... the antler is also a reminder of the IQ value of practice and the importance of continual improvement in order to become successful

(p. 19)

« The Learning Continuum is like the continuous process of building an iglu, block by block, row by row » (Inuit Qaujimagatugangait, Education Framework for Nunavut Curriculum, 2007, p. 39)

Goals of Study: What can we learn from these programs for Education at large in Inuit Nunangat

To document learning and becoming through participation in community driven stewardship programs,

- programs that are grounded locally
- driven by and responding to local needs
- assumed by Inuit and their communities
- researchers are solicited by Inuit for expertise & support, but the programs stay in the hands of Inuit

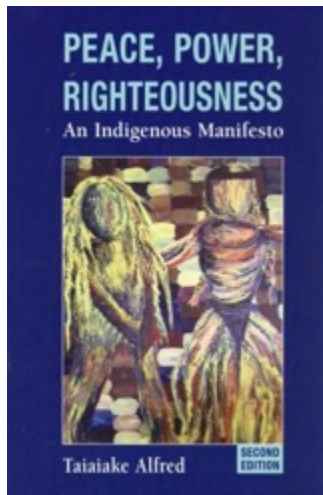
We assume that these programs are about *Resurgence* in ways Leanne Betasamosake Simpson talks about it...

The programs are “concerned with the reattachment of our minds, bodies, and spirits to the network of relationships and ethical practices that generates grounded normativity »

...the reattachment of our bodies to our lands, regardless of whether they are rural, reserves or urban. It means that our resurgent responses to settler colonialism must come from within our nation-based grounded normativities. **Radical resurgence means nonhierarchical relationships between land and bodies, bodies meaning the recognition of our physicality as political orders, and our intellectual practices, emotions, spirituality, and hubs of networked relationships.** (p. 44)



They are also a call for the re-establishment of Relationships and Living in Relations (Taiaiake Alfred)



“As indigenous nations, we’ve been disconnected from who we are as people, from the sources of our strength and our very survival: our land, culture and community” (p. 5).

To move beyond that disconnect and engage in resurgence has to come from within through “the re-creation of sound communities, individual empowerment, and the re-establishment of relationships based on traditional values” (Alfred, 2009, p. 60).

Our argument

These programs offer illustrations of possibilities of change from within, empowerment, pride, and a move beyond “dispossession” towards cultural health.

Method: 3 Contexts/Different Local Programs & Activities

1. Arviat, Nunavut
Young Hunters
Program

Environmental
Monitoring Program
& Greenhouse

(Collaboration with
Qaujigiartiit Health
Research Centre &
ARCTICConnexion)

Arviat Film Society

2. Pond Inlet,
Nunavut

Expanded
Leadership to
Study Water
Quality

(Collaboration Pond
Inlet &
ARCTICConnexion)

3. Sanikiluaq,
Nunavut &
Inukjuak &
Umiujaq, Nunavik

Arctic Eider

Community-Driven
Monitoring
(Stewardship &
Sustainable Northern
Development) &
Education

(Indigenous methodology (deLeeuw, Cameron, Greenwood, 2012; Wilson, 2008; e

In 2018, Ujjiqsuiniq: An amalgamation of Young Hunters and Youth Monitoring Programs

Aqqiumavvik Society is currently aligning the curricula of these 2 programs so that all youth receive critical age appropriate skill training in all areas of monitoring and sustainable harvesting.

The program is open to 10-25 year olds.

The program includes training in SmartICE, mapping on land and sea, identification of new species, diseases and condition of wildlife.

Helps to establish a foundation of *avatimik kamattiarniq*--stewardship



KIVALLIQ WILDLIFE
PARASITES
&
DISEASES

ISOLATED ABSCESS



What is it?

Infected Areas of Pus
An abscess, or pus filled infection, can be found anywhere on the body of a caribou. Often linked to a lymph node (part of the immune system for fighting infection and disease). It is not a sign of poor overall health of the animal if it is a single, isolated abscess.

What does it look like?



Example of an isolated abscess found within a caribou

Where is it found?

Infections can be found anywhere on the caribou's body.



Is the animal safe to...

-  **SKIN / BUTCHER?** ✓
-  **EAT RAW?** ✓
-  **EAT COOKED?** ✓
-  **FEED DOGS?** ✓

TIP

You should carefully remove all of the infected tissue and wash knives/hands that come in contact with it. The rest of the animal is safe to eat.



Information sourced from local hunters and the Government of Nunavut - Department of Environment.

The program assesses information and concerns raised by harvesters and provides information back to the community

Youth are being trained as message carriers to engage the community with important information for sustainability

2. Case of Pond Inlet

The Expanded Leadership to Study Water Quality Program



Data collection and analysis in Pond Inlet; Training in Laboratories at Universities; Scientific Meetings/Community

Back in 2014, no local capacity to monitor water quality, yet it was a major community/health concern

- Document Community & Inuit Elders' Knowledge on Water Monitoring Practices

Sample Water in 6 Streams & 2 Lakes; Record:

- Climate data
- Hydrological data (water flow, water depth, etc.)
- Physico-chemical parameters (pH, conductivity, dissolved oxygen, temperature)
- Fecal bacteria indicators
- Invertebrates like small insects and larvae

Become an Expert in Western Science through/ grounded in IQ: Develop a Sense of Pride and Agency



“Inuit youth training Inuit youth, that became the spirit of the project” [Tim, 2018]

It’s about “Inuit moving ahead, kind of, it’s part of the decolonization process, and it’s just great to be part of it” [Tim, 2014]



Relationship with Scientists/Being Capable: A community-based project, it feels like it is **my project**, it is **our project**. Like these people are helping us, train us to do these things, so that we can keep doing this... and then when researchers come into town... **you know what to do with the samples**, you know how to analyze them ... you are not just collecting for a researcher... [Nooks, Arviat, 2016]

It's a community driven project, community concerns, and it's run by Inuit, and having an Inuit leader just gives them pride, it'll empower them to do their own one day [Tim, Pond Inlet, 2016]

Relationship Building with Elders: They noticed I was understanding of Inuktitut, so they all got to the table, in a circle, I was the map boy, but then they started to look up at me like I was the leader of this project, like they are telling me all this information, and it was great to be, being looked up as the leader from the elders, since they were usually the leaders, they looked up at me like I was one of them [Trevor, 2014]

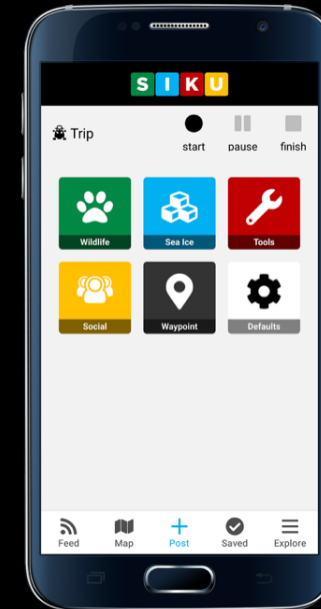
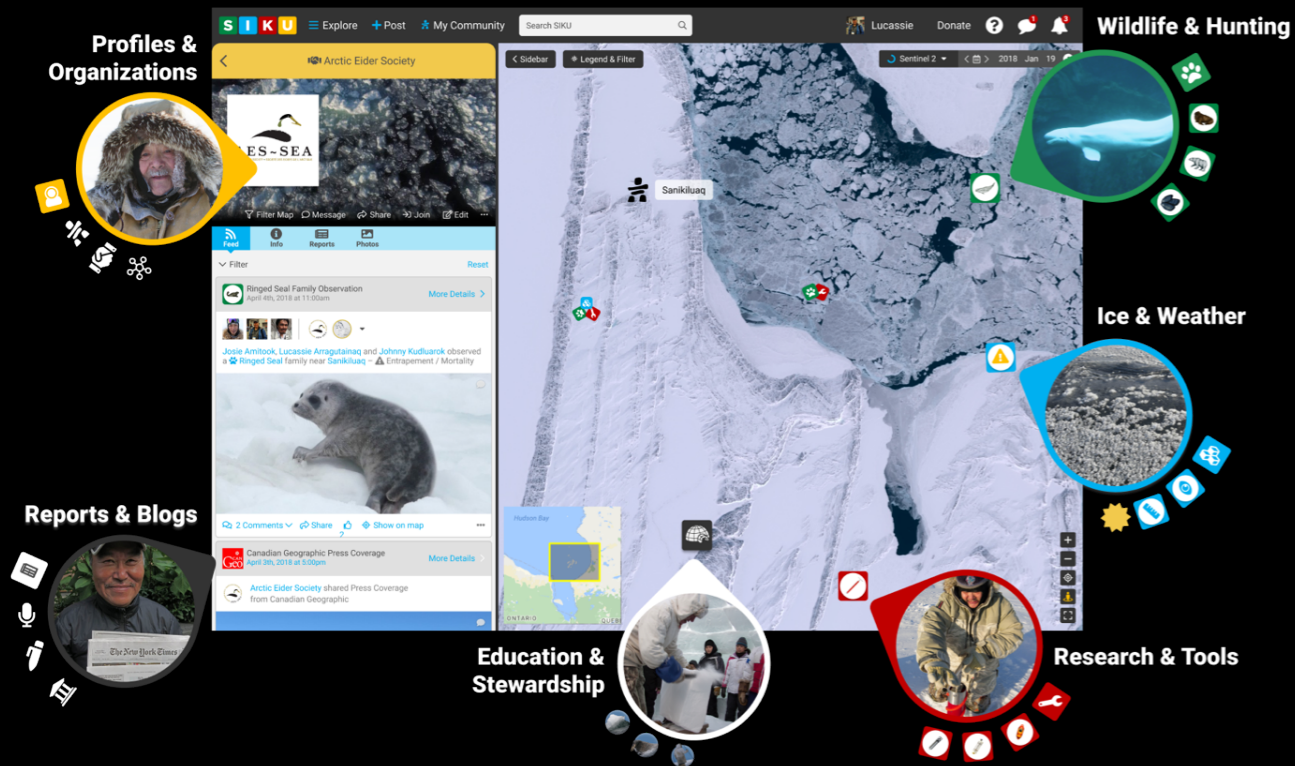
WHO WE ARE

- An Inuit-led charity supporting Indigenous-driven solutions for healthy communities.
- We work with Inuit and Cree communities to provide training and capacity in community-driven research, Arctic-based educational resources for youth, and innovative tools and technologies to help communities address issues of food security and environmental stewardship.





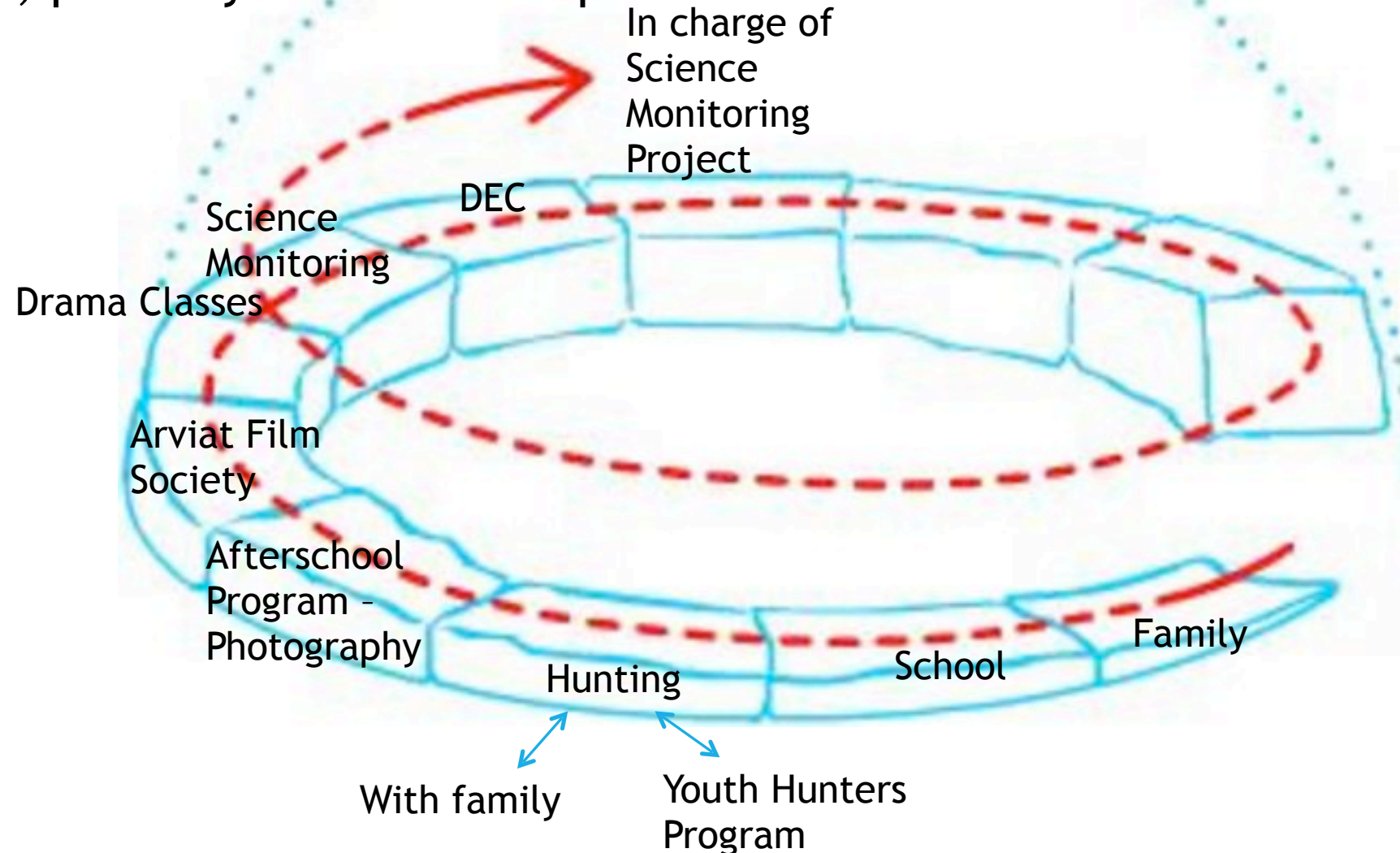
The Indigenous Knowledge Social Network



Discussion

Inunnguiniq (The making of a human being): Creation of learning opportunities that support lifelong learning and lead to empowering pathways for youth, building on their strengths and hence, pathways that are unique to each individual

“it will take them forward in real life situations... need opportunities to explore yourself, your own capabilities your own interests, and then you know, it gives you the confidence to take the next step forward to go down your own path” (D.T.)



Implications for Education

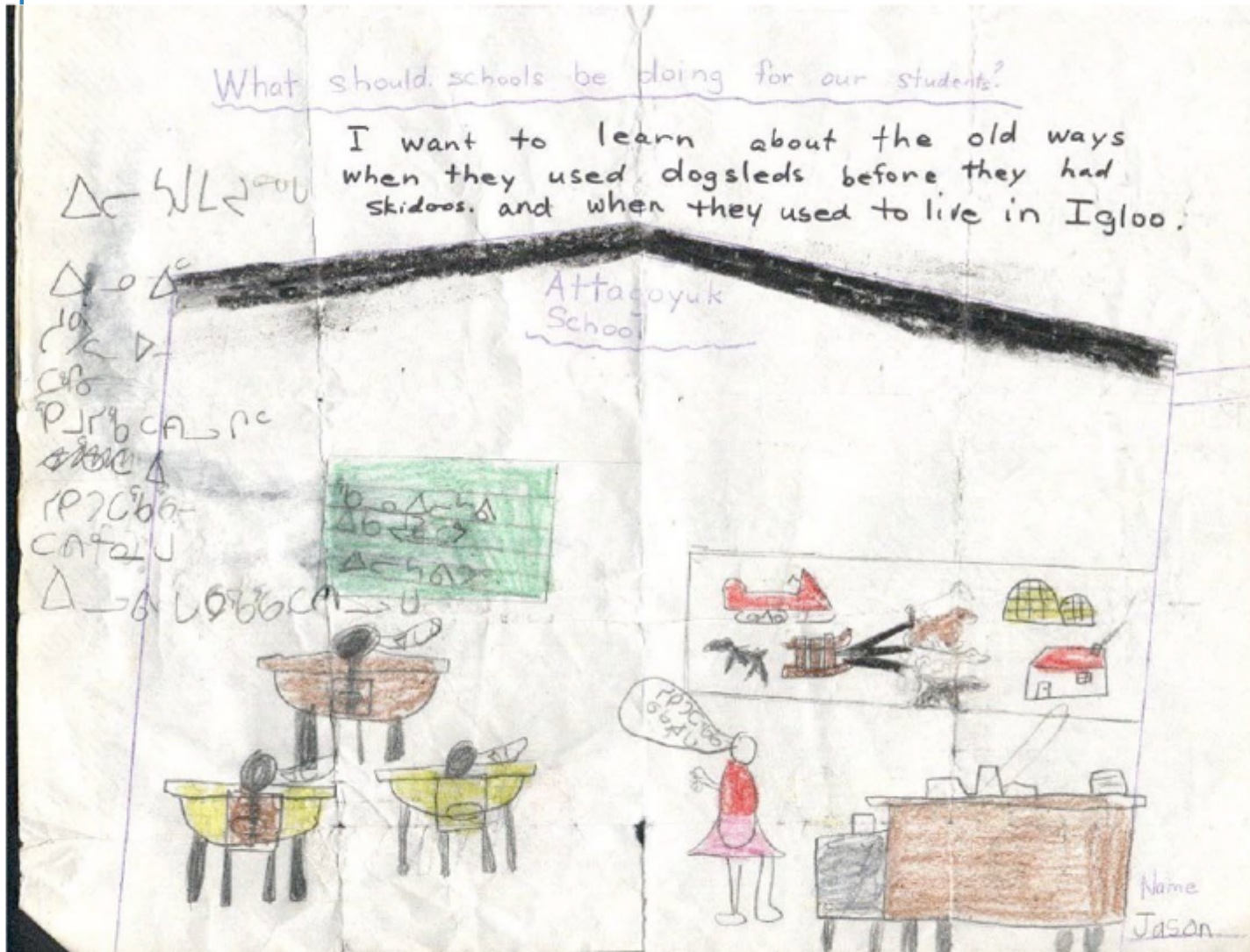


Figure 129: Jason Kilabuk Third Grade Entry for 1988 Baffin Divisional Board of Education Writing Competition

Instead of creating “add-on” language and cultural programs, these case studies make evident the power of locally grounded and Inuit-led programs deeply grounded in IQ, that can respond to local needs quickly.

The programs also make the “old ways” available to youth who have no chance to live them elsewhere, and thereby supports the resurgence of IQ , supporting “grounded normativity” (Simpson) and helps youth move beyond “dispossession” (Alfred)

Challenges & Next Steps

“We know our children will have to face struggles that we never imagined but they can still be prepared for these through inunnguiniq”. Louis Angalik, 2010

Programs should be Part of School System, would then not continually need to look for third party funding

“As an educator, I would really like to see these programs entrenched in the school system” (S) - would solve funding and housing problem of program

Accessible to Everybody

“They should be part of life, these opportunities should be accessible to all Inuk children in Nunavut - they should be core programs” (S)

Key Role in Revitalization of Cultural Practices to Move Forward

Programs play a key role in revitalizing, bringing key pieces back that are critically important to cultural sustainability & physical sustainability in terms of food security (S), but also so much more as they embody and contribute to inunnguiniq and are grounded in IQ

Implications for Science, Technology, Engineering and Mathematics Education (STEM)?

Need to Move beyond a Discourse of Oppositions & Dichotomies : Industrial Thinking vs Indigenous Thinking; Western Science vs Indigenous Science/Traditional Ecological Knowledge ...**Towards a Relational System/ Blended Vision of Indigenous & Western Ways**

“Understanding dynamics of human-nature relations”... “may prove critical to developing socially and ecologically just and sustainable communities in the twenty-first century” (Bang et al., 2015, p. 311)

New Pedagogical Questions in STEM/Education at large:

How can we support the navigation of epistemologies (encourage the teaching of navigations among Western and Non-Western epistemologies of ways of knowing; of science)?

How can we redefine STEM in more holistic ways and not as a commodity, but as a tool for action, as transdisciplinary?

How can we rethink STEM education as learning across generations?

How can we ensure a reconnection with the land, culture, language, etc., at the root of a new vision of STEM?

How can we strategically transform institutional relations (School-Land-Community; Indigenous Communities with Universities, etc.) to support the Making of a Human Being (Inunnguiniq) and Lifelong Learning?



Merci Qujannamiik Nakurmi