Challenging the “Perfect Storm” in Indigenous Education: Stories about Context, Culture & Community

Sharon Nelson-Barber, EdD

“Moving Research into Practice:” Teacher/Leader Effectiveness and Turning Around Low Performing Schools in Indian Country

Oklahoma City, OK

June 2015
System Level Challenges
Elements that Converge to Create the “Perfect Storm” in Indigenous Education

- Generations of cultural trauma (e.g., punishment for use of heritage language, assimilative schooling)

- Loss of community self-determination; loss of personal and collective self-efficacy

- Forced separation from ancestral homelands, land-based practices, and associated cultural identity

- Pollution from dams, mining, toxic waste causing severe human health consequences over generations
Elements that Converge to Create the “Perfect Storm” in Indigenous Education

- Disruptive impacts of weather and climate on subsistence activity and heritage practices
- Disconnection between important knowledge for daily life and what is taught in school
- Discontinuity between ways of communicating and interacting at home and in school
- Limited opportunity to demonstrate knowledge due to mismatch between values of indigenous knowledge systems and assumptions of Western systems (amplified by current testing methods)
- Ongoing loss of heritage languages and practices due to dominant culture’s educational values
Discussion Questions

• How would you describe the role that cultural trauma and collective pain plays in community ability to self determine?

• How have you seen the effects of this “perfect storm” in the communities you interact with?

• What kinds of adaptive cultural responses or strategies have you seen that promote resilience?
Cultural Validity in Assessment
NSF-REC 0124047; NSF-DRL 0733329
CONVENTIONAL TEST DESIGN

- Language
- Life Experience
- Community Norms & Values
- Enacted Curriculum (Formal)
- Socioeconomic Status
- Culture
- Repertoires of Practice

Conventional Test Design → Assessed Learning → Actual Student Knowledge
Bacteria and laboratory animals are sometimes used by scientists as model organisms when researching cures for human diseases such as cancer. Describe one possible advantage and one possible disadvantage of using bacteria as models to help find cures for human diseases.

**Advantage:** Bacteria aren’t like dogs and cats, so they’re not supposed to be suffering. Or at least we think that, but there’s no way to know.

**Disadvantage:** We aren’t like bacteria.

Describe one possible advantage and one possible disadvantage of using laboratory animals such as mice, guinea pigs, and monkeys as models to help find cures for human diseases.

**Advantage:** Closer to being humans

**Disadvantage:** There is no such thing as laboratory animals. All animals are our brothers and sisters and our spiritual teachers. We don’t have the right to use or kill them unless it is for food.
ELICITORY TEST DESIGN

Features:
• context-richness
• item content relevance
• process-emphasis
• connection to field of personal knowledge
• proximity to direct experience

Assessed Learning
Actual Student Knowledge

Socioeconomic Status
Community Norms & Values
Life Experience
Enacted Curriculum (Formal)
Culture
Repertoires of Practice

Language
Certain types of animals (bacteria, mice, rabbits, monkeys etc.) are used by scientists as “model” organisms in experiments that help them to learn about the ways human diseases can be treated or cured. For example, a scientist studying treatment for diabetes might give a newly invented drug to a rabbit and measure closely what happens to the rabbit before testing that drug on a human. In the boxes below, list all the positive and negative things you see as possible outcomes from scientists using animals as model organisms in this way.

<table>
<thead>
<tr>
<th>Positive or beneficial outcomes</th>
<th>Negative or harmful outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Rabbits would die from bad drugs instead of humans</td>
<td>1. We might get bad karma from treating the animals as lower life forms from us</td>
</tr>
<tr>
<td></td>
<td>2. Using animals for research means that they are not out in the environment living happy lives, they are suffering in cages</td>
</tr>
<tr>
<td></td>
<td>3. We shouldn’t be trying to cure diabetes or cancer, we should be learning how to prevent it. That doesn’t need an animals.</td>
</tr>
<tr>
<td></td>
<td>4. You could get in trouble if rabbit was your ‘aumakua [family guardian spirit] and you hurt it.</td>
</tr>
</tbody>
</table>

b) Considering the information you listed above, write your perspective about whether or not animals should be used in scientific research.

_I don’t think animals should be used in scientific research because animals have just as much of a right to heal themselves and feel good and not be in pain as we do. They aren’t lesser than us, and we aren’t greater than them, so we don’t have the right to use them._
Discussion Questions

• Share an insight that you’ve gained from seeing these examples of student thinking.
• What kinds of assessment strategies do you think might expand our ability to elicit, see and measure what students really know and do?
Successful Implementation of a Yup’ik Cultural Curriculum (J. Lipka, UAF)
<table>
<thead>
<tr>
<th>Module</th>
<th>Number &amp; Operation</th>
<th>Patterns &amp; Functions</th>
<th>Geometry &amp; Spatial Sense</th>
<th>Measurement</th>
<th>Data Analysis, Statistics &amp; Probability</th>
<th>Problem Solving</th>
<th>Reasoning &amp; Proof</th>
<th>Communication</th>
<th>Connections</th>
<th>Representation</th>
<th>Grade Level</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angles &amp; Locating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2-3</td>
<td>being developed</td>
</tr>
<tr>
<td>Attributes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2-3</td>
<td>being developed</td>
</tr>
<tr>
<td>Baskets - Symmetry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3-4</td>
<td>piloted</td>
</tr>
<tr>
<td>Baskets 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-6</td>
<td>being developed</td>
</tr>
<tr>
<td>Berries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-2</td>
<td>piloted</td>
</tr>
<tr>
<td>Design &amp; Build it!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-6</td>
<td>piloted</td>
</tr>
<tr>
<td>Fishing - A Chancey Probability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-6</td>
<td>being piloted</td>
</tr>
<tr>
<td>Hanging &amp; Drying</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-6</td>
<td>being piloted</td>
</tr>
<tr>
<td>Kayak</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3-4</td>
<td>being developed</td>
</tr>
<tr>
<td>Measurement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-2</td>
<td>being developed</td>
</tr>
<tr>
<td>Numeration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-2</td>
<td>being piloted</td>
</tr>
<tr>
<td>Patterns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-2</td>
<td>piloted</td>
</tr>
<tr>
<td>Gaspeq - Women's Clothing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3-4</td>
<td>being developed</td>
</tr>
<tr>
<td>Smokehouse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-6</td>
<td>being developed</td>
</tr>
<tr>
<td>Star Navigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-6</td>
<td>being developed</td>
</tr>
<tr>
<td>Elastic Geometry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3-4</td>
<td>being developed</td>
</tr>
</tbody>
</table>

**KEY:** ● - Meets NCTM standards ○ - Partially meets NCTM standards ○ - Not Addressed
FISH DRYING ON THE FISH RACK
Instructional Participatory Structures

Excerpts from Case Study: Joint Activity a Pedagogical Approach by Jerry Lipka

Video and transcript analysis of interaction...
...What are the facts?...

Making the Embedded Mathematics Explicit...
List out the embedded mathematics that is involved in the paper folding associated with this activity...
...How do these mathematical ideas relate to one another?
Which of these mathematical concepts are “big math ideas.”...

Discussing the notion of joint activity and expert-apprentice modeling...
...How does the teacher assign students to work groups?
...Do the students seem to know what their roles are?
...What is the relationship between teacher and students in this phase of the lesson?
...Who is responsible for determining when assistance is needed? What math is taking place?
...How is joint activity different than a typical classroom structure?...

Figure 1: Student creates her pattern

Figure 2: Joint activity as Nancy works along with her students

Lipka, Math in a Cultural Context

Expert-apprentice

Joint Activity

Collaborative

Cooperative

Teacher-Guided

Student-initiated...
Use of the *Picking Berries* module increased the gains students made in their understanding of key math concepts.

Impacts from HLM:
- **Total score:** 10.35 %pts (ES=.82, p<.001)
- **Measurement:** 9.94 %pts (ES=.90, p<.001)
- **Representing data:** 16.02 %pts (ES=.75, p<.01)
Use of the *Going to Egg Island* module increased the gains students made in their understanding of key math concepts.

Impacts from HLM:
- **Total score**: 9.74 %pts (ES=.39, p<.001)
- **Grouping**: 8.39 %pts (ES=.30, p<.01)
- **Place value**: 9.56 %pts (ES=.33, p<.01)
Use of the MCC modules increased the gains made by students in both rural and urban areas.
Use of the MCC modules increased the gains made by both Alaska Native and other students
Discussion Questions

Even in a context where cultural worldviews and perspectives differ from dominant conventions, this community was able to create a context-rich successful instructional intervention that benefitted diverse students and communities.

--What message do you take away from this story of a successful Yup’ik curriculum implementation?

--What kinds of benefits would you anticipate for all learners if culturally-rooted, context-rich, experiential curricula became the new norm?
Summary Points

• Intervention is urgently needed in Indian country to address the ongoing human costs of the 250-year legacy of aggressive assimilative policy toward Indigenous peoples

• Definition and practice of assessment within indigenous communities is fundamentally different than in the dominant US culture because many groups have distinctive worldviews and value different sets of outcomes

• Indigenous knowledge systems offer rich context-embedded perspectives to inform and inspire creative solution designs
Thank you

snelson@wested.org