

CITIZENSHIP SCIENCE?

RESPONDING TO INDIGENOUS COMMUNITY VOICES



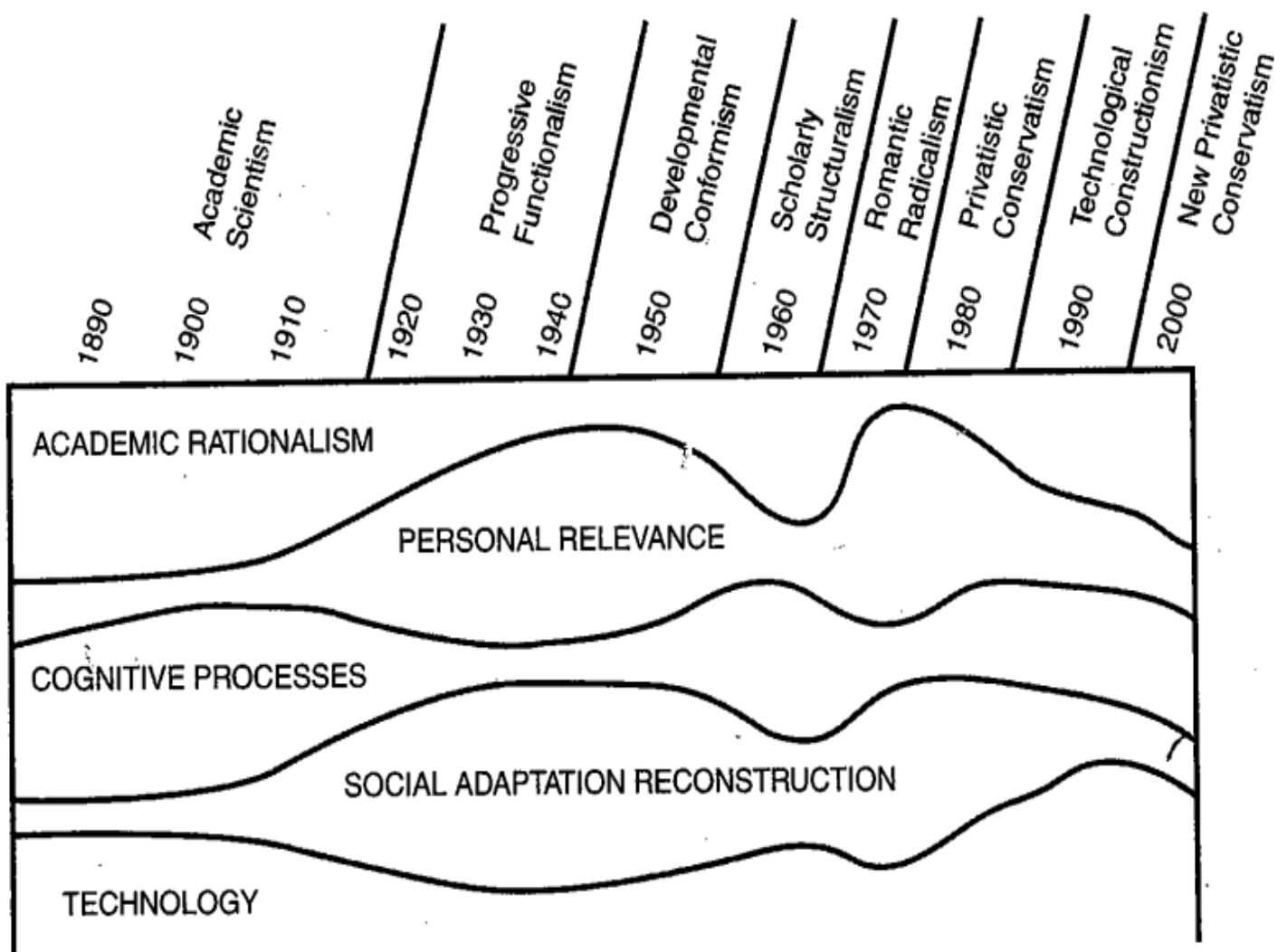
Brian Lewthwaite & Kimberley Wilson

Dominant and Dominating Discourse in Science Education

- Example (Aus): ... science education, both as a contribution to informed citizenship and to encourage young people to prepare themselves for careers based on science and technology.
- Example (NZ): ... science education's goal is to develop students who can participate as critical, informed and responsible citizens in a society in which science plays a significant role
- Ongoing tensions associated with serving national interests by preparing a small number of future scientists at the expense of engaging all young people in 'citizenship' science.

Whose Citizenship?

- A common tension in science education, and education in general, is that the goals of (science) education are usually nationalistic in orientation often marginalizing the interests and aspirations of local communities, especially its Indigenous citizens (McKinley, 1997)
- Citizenship science is largely focused on furnishing the needs of national Citizenship and, consequently, fails to address what local communities and their citizens see as priorities for science education.



Engaging Diverse Students with Science

- We see clear evidence that the curriculum and classroom practice are failing to excite the interest of many, if not most, young people at a time when science is a driving force behind so many developments in contemporary society (Tytler, 2010)
- While much policy attention is directed towards improving mainstream secondary students' engagement with science, the needs of those who might be considered 'non-mainstream' (Lee & Buxton, 2011) appear to have been sidelined.

Our Efforts

- Responding to the voices of those on the margin
- Costa (1995)
 - *Potential scientists – world of family and friends are congruent with the worlds of school and science.*
 - *Other smart kids – for whom the worlds of family and friends are congruent with school, but not with science.*
 - *“I don’t know” students – for whom the worlds of family and friends are inconsistent with both school and science.*
 - *Outsiders – for whom the worlds of family and friends are discordant with both school and science.*
 - *Inside outsiders – for whom the worlds of family and friends are irreconcilable with the world of school but potentially compatible with the world of science.*

The Flexible Learning Centre Context

- ❑ Registered non-state schools with accredited educational pathways.
- ❑ 'Walk with' with young people who have disengaged from the mainstream schooling system.
- ❑ Young people come from a diverse range of backgrounds with a large percentage identifying as Indigenous (particularly in North Queensland).
- ❑ Complex life circumstances that demand a unique response.
- ❑ 'Re-engaging Disadvantaged Youth Through Science'
ARC Project 2008-2011

Outsiders in the FLC Context

- ❑ **Teacher Mt Isa:**
- ❑ They always used to say, why have we got to do this?
What's this got to do with us?
- ❑ **Teacher Deception Bay:**
- ❑ They hear the word science and they go 'ugh' because they work from textbooks and they do lots of writing and they don't do hands on activities and that's what they want to do.

Insiders/Outsiders...

- **Teacher Brisbane:**
- They want an education but they don't know what that means in practice. It takes a lot of breaking down what you actually mean with 'I want an education' and they would never walk in and say I want to learn about genetics, but they would walk in and say, hey miss is it true that if you have two brown eyed parents you can't have a blue eyed child?

Teacher Responsiveness

- ❑ **Teacher Brisbane**
- ❑ The other thing that is really important is that these kids haven't got the formal language of schooling - you know that socialising aspects of language - they again missed that. The majority of them - even the really bright ones - even the really really bright ones simply don't have that translating.
- ❑ I have to translate some of the questions. I don't have to do the work for him. He can do the work perfectly well, but I have to translate the tasks.

Connecting with Students' Lived Experiences

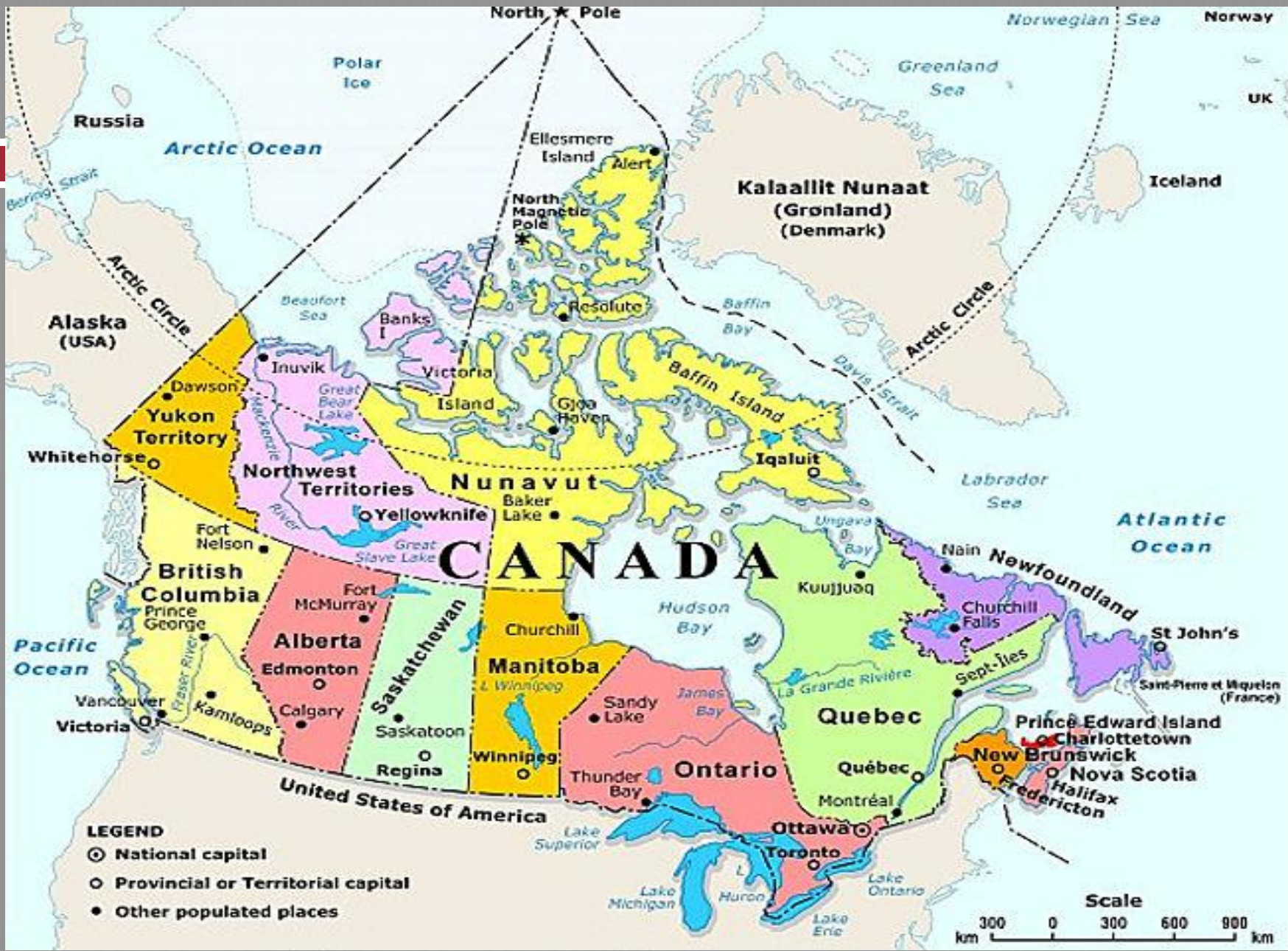
- **Teacher Townsville:**
- I think particularly with that wetlands and the diabetes, all of that stuff is more around - and the garden that we're doing at the moment - one is what's useful to them, particularly in that situation at the moment, a lot of it's what's going to engage them as well. But particularly with, say, the diabetes thing, it was very much a thing of, well this is an issue for families, particularly Indigenous families.
- It's not something that is separate to them. It's not learning acids and bases or something. That's external to their life and it's something that they engage with head-wise rather than, well how does this work for my family? If auntie has diabetes, I now can cook a bunch of meals that are suitable for her. Or I can tell her off and say, auntie, you shouldn't be eating that. So it's kind of that thing of - it fits in with the lives that they're actually living. It's not separate to it.

Respecting Indigenous Knowledges

- **School Principal Brisbane:**
- Now I mean see it comes down to language again doesn't it. I mean what is science? If science is broadly speaking knowledge about the world and how it operates, well then that's science surely. Like when are the crabs going to be here? Why do we only take two crabs and leave eight? Like if that's not science, biological science or whatever the words are. You know, like there's all different types of science. I mean there could be lovely programs there as a starting point to bridge that gap.

Responsive Science Curriculum in Action in Queensland Flexible Learning Centres





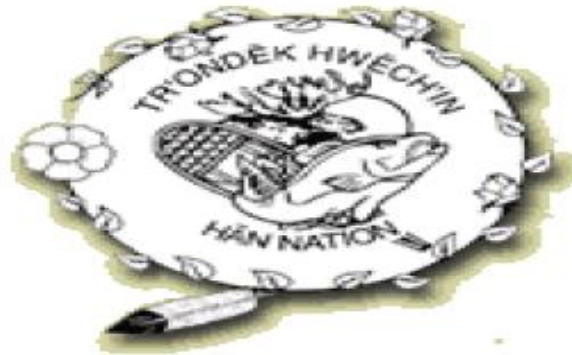


- ❖ Self Government Agreements in place across Canada's north
- ❖ 18% completion rate Aboriginal compared to 67% non-Aboriginal. 3% engaged in school science at Year 12.
- ❖ Draws to question schooling for all students, but especially FN
- ❖ Significant changes in policy and tensions

Our Research & Development Work

- ❑ Identifying the teacher actions that influence student engagement & learning
- ❑ Collecting community's – parents, students and teachers - “Stories About Learning and Teaching”
- ❑ Stories ‘problematize’ teaching
- ❑ Not just what is taught, but also how and why
- ❑ Identify teachers and ‘teaching’ of consequence
- ❑ Use Develop Effective Teaching and Teacher Profiles used to inform changes in practices
- ❑ Determine influence on student engagement and learning – primarily quantitative

Our Stories about Learning and Teaching

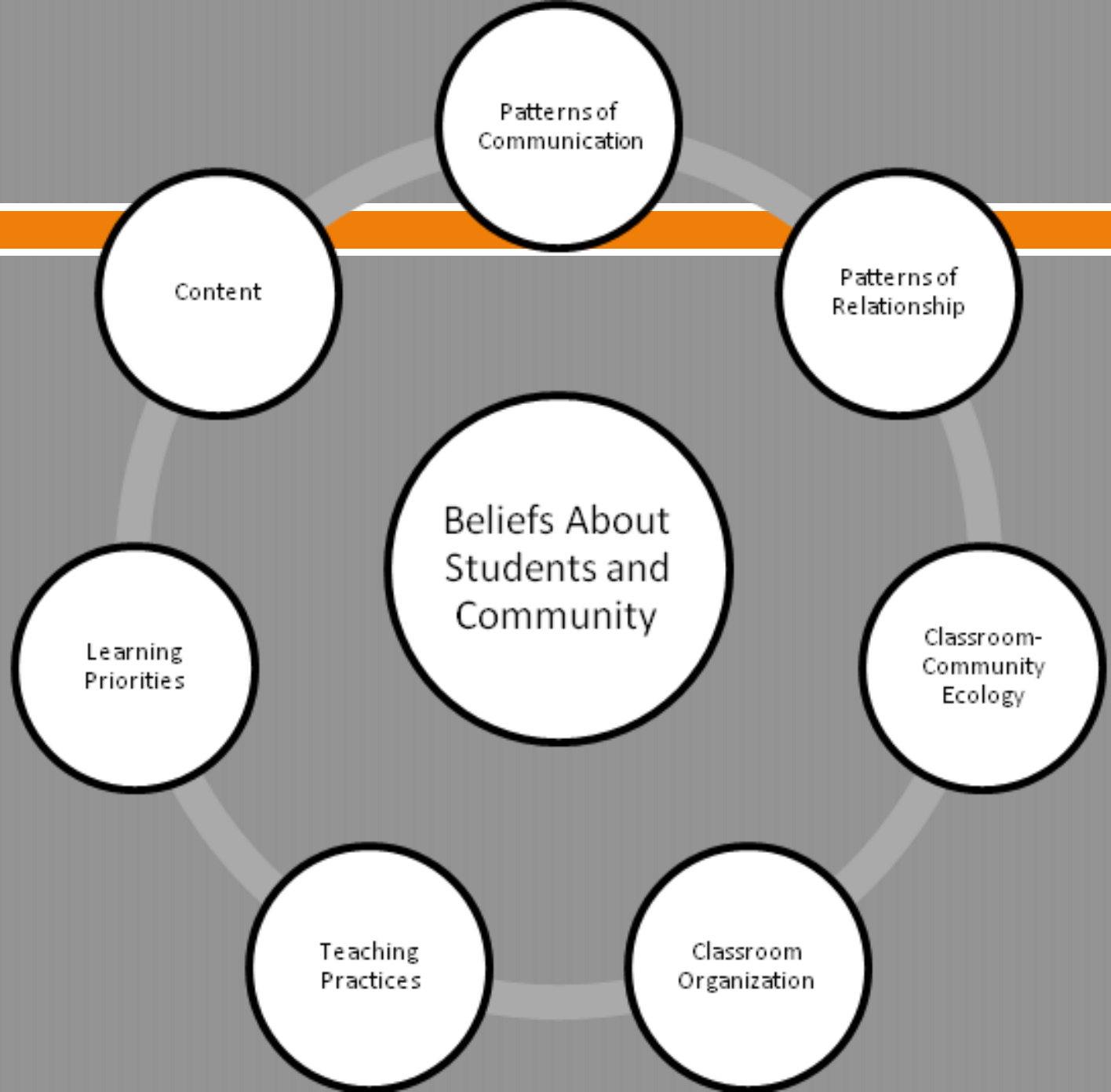


**Members of a Yukon First Nations' Community Share
Their Stories to Assist Educators in Becoming
Responsive to the Learning Styles and Aspirations of
Their Community**

Case Narrative One:

It is like for many years we have watched this thing you call 'education' occur in our town. I know there is much that can occur in the school that is good, but it does not make a person wise. In our culture there is nothing more important than the learning that makes a person wise. The main thing the southern culture wants from school is 'head knowledge'. That is what it has always emphasized. I do not know why. It intrigues me. Your focus is mainly on the gaining of a kind of knowledge that seems to have little value in understanding the world and to make us wise people. I see it has some value, but maybe this value is only to make someone seem better than another. I think that schools can become focused on this. I think this is why many of us in the past questioned the very purpose of schools. It seems to focus on the individual and their future, not the future of the community.

Our community would say that is only a small part of what schools should be about – it is about 'making a human being' that can contribute to our society. There is much to learn from our culture, not only our knowledge of the natural world but maybe, more importantly, how one should live *in* this world. It is most important this learning about how to live in the world. This is not seen as important. Without this things will not go well, both for the person and the world as a whole. In our culture the wise person has qualities like being innovative and resourceful for the benefit of others, or a willingness to persevere and not give up easily or contribute to the welfare of the group. All of these have not had much value in school, but now I hear it is becoming that way. This must happen.



Expressions of Change

I did not come here to just carry out my life from down south. If that was what I wanted, I would have stayed there. Both my life in this community and my teaching had to change. I couldn't just impose what I think education should be on these students who have a rich cultural past and a future that has to be on their terms. I wanted what I did here to be a part of a new future (for Nunavut). I think there are many teachers that have come here (over decades) and have been willing to adjust significantly to what is important here. You just about need to clear your head of the messages that creep in and focus on these kids and this community. The parents want their kids to do well at school. It's the same goals, but you just have to be really with it. Connecting what you do to students' lives and validating the community is what seems most important. It's not easy and it takes a different mind set and a broader skill set. I think your work just helps us to ground what we do. You get a better sense of what makes it work. (Irwin, 2010).

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- ❑ Participating Communities: Pond Inlet, Igloolik, Inuvik, Arviat, Aklavik, Dawson City, Old Crow
 - ❑ Natural Sciences and Engineering Research Council
 - ❑ Canadian Council for Learning
 - ❑ Social Sciences and Humanities Research Council
 - ❑ Nunavut, NWT & Yukon Education