

RE-MEMBERING PLACE: MATHEMATICAL ACTIONS FOR INNOVATIVE, RESILIENT, AND CULTURALLY RICH COMMUNITIES

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How might mathematics educators recognize discourses as resonating harmonies in their practices as researchers? In this paper we share individual experiential narratives guided by Ojibway author Richard Wagamese's Medicine Wheel teachings in the four directions of East (humility), South (trust), West (introspection), and North (wisdom). As we journey through (re)membering place we offer opportunities for recognizing resonating harmony(ies) and algorithms in our practices as mathematics education researchers and for engaging with critically dissonance discourses and actions. This (re)membering supports relating with each other, mathematics, communities, and place in ways that are more sustainable, inter-connected, and kincentric.

Keywords: place and land education, Indigenous perspectives, ecological perspectives, mathematics education

Introduction

We, Florence, Cynthia, and Jennifer, all mathematics educators and researchers, use Ojibway author Richard Wagamese's (2011) four direction Medicine Wheel teachings to share our individual research journeys. We use stories (Clandinin & Connelly, 2002) to re-member and re-think our individual actions and the ways those individual actions have woven together to become collective work. Wagamese's teachings follow the direction that Earth travels each day. Just as humans have said that the start of the day is in the East, Wagamese's Medicine Wheel teachings also begin in the East. This paper is written in the four directions; East, South, West, and North. Wagamese's Medicine Wheel teachings start the section; followed by stories of each of the authors.

East

THE OLD ONES say that humility is the foundation of everything. Nothing can exist without it. Humility is the ability to see yourself as an essential part of something larger. It is the act of living without grandiosity. Humility, in the Ojibway world, means "like the earth." The planet is the epitome of a humble being, with everything allowed the same opportunity to grow, to become. Without the spirit of humility there can be no unity, only discord. Humility lets us work together to achieve equality. Humility teaches that there are no greater or lesser beings or things. There is only the whole. There is only the great, grand clamour of our voices, our spirits, raised together in song. (Wagamese, 2011, p. 9)

Humility: The Power of Place (Cynthia)

It's common for cliffs on Haida Gwaii along Canada's Pacific northwest coast to receive 10m high waves, for spruce trees to dance in a southeast storm, and for the ocean to leave platters of cockles, clams, crab, and octopi on its beaches when the tide is out. Haida Gwaii is a land between sea and sky where the worldview Gin 'waadluuwan uu gu dil adiidaa "everything depends on everything else" speaks to the synergetic relationship between humans and

nonhumans, natural and Supernatural Beings. It is a place where “culture” says Haida artist and activist Guujaaw “actually is our relationship to land” (Guujaaw as quoted in Jones, 2006 p. 29). The inlets and shores of Haida Gwaii are nutrient-rich and tempered with warm offshore currents feeding a diversity of life. In spring grey whales migrate between their winter breeding areas in California and their summer feeding waters in the Bering Sea. From our little log cabin on Haida Gwaii’s North Beach, living without electricity or running water, we could see the whales along their route, releasing their breath with spectacular spray as they prepared for the next dive.

One spring afternoon out in our 12 ft Zodiac boat, we found ourselves surrounded by a pod of grey whales. A kilometre off-shore with no other boats in sight, we shut down the motor as the greys circled. Maybe they were curious about who had ventured into their territory. Maybe the bottom of our Zodiac looked familiar from a whale’s perspective, but different enough to make them curious, take notice, and check us out. Three maybe four barnacled backs rose from the water, one flipping a tale wider than the length of our dwarfed boat. Their breath lingered while we held our own.

Without warning one broke from the circle and swam directly toward us. Grey whales can reach 15 m (about 50 ft) in length. I imagined this massive being flicking us in the air like a dog playing catch with a ball. We sat still, as still and humble as what Atleo calls an “insignificant leaf floating in a spring well” (Atleo 2011, p. 98). The power in this moment lay with this whale. As the whale slipped smoothly and quietly – planned and precise – under our boat and rose on the other side we acknowledged our respect with thanks. And, as if this magnificent animal heard us, the whale circled back. Resting its head on the water’s surface, we met eye-to-eye, feeling once again the power of this relationship and our place within it. This whale’s gaze and ‘playful’ interaction reminded us of our own fragility as visitors in their realm.

Haida oral stories speak of interactions between humans and nature and Supernatural Beings as sharing skins. Under our skins, both human and nonhuman, we are reminded that we are all connected, sharing this power of place.

Humility and Earth (Jennifer)

“Humility, in the Ojibway world, means ‘like **the earth**. ...[H]umility ... is **the foundation of everything. Nothing can exist without it.**” (Wagamese, 2011, rearranged, p. 9).

These words which describe the Ojibway world re-remind me of my Chinese grandmother’s family name. “Chan” written as Chinese characters 陳 (see also Figure 1) animate familiar meanings of place, direction, and temporality to those of Ojibway meanings for East. 陳 means earthly place, landscape, ancient, and abundant. 東 as the sun rising from behind the tree is East which infers morning but also spring as the first season of the new year. Thus, not only does the direction of East locate Earth as place but it also posits Earth as originary and foundational. Just as light appears, day breaks night, and from winter comes spring, it is from the East where new beginnings and possibilities emerge.

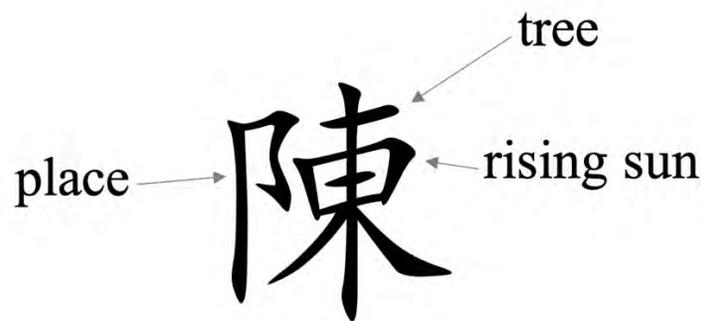


Figure 1. Chinese characters for “Chan”

“Humility, in the Ojibway world, means ‘like the earth. ...[H]umility ... is the foundation of everything. Nothing can exist without it.’” (Wagamese, 2011, rearranged, p. 9).

Deeper within the layers of Wagamese’s description, I hear the wor(l)ds of Japanese-Canadian curriculum scholar Ted Aoki. Aoki (2004a) remembers and reminds that the word *humility* is etymologically akin to earth. From *humilis* meaning “on the ground”, *dhghem* or *humus* as “earth”, and *don* as “place” (Humility, 2022), the very word has originated and evolved from *earth*. Humility as described by Aoki (2004a) is “concerned with lived space[s] where people dwell communally ... with others [and] earth under the sky.” (p. 300) And just as *humility* comes from *humus*, Aoki (2004a) remembers and reminds that we *humans* do too.

While East marks first light, new beginnings, and starting points, humility calls for contemplation of what has come before. Humility makes returning to and reconsidering onto-epistemologies of place possible. In doing so, it allows for movement and change. *Returning* then is not simply ‘turning around’ or ‘going back’ but ‘turning again’. Further, from the East turning again conceptually conjures notions of a turning point or starting anew.

For me, East signifies the first part of my journey as graduate student. Asked by my supervisor why I decided to pursue further studies in mathematics education, I explained to her that: “When I am in the mathematics classroom, there are certain things and events I can see and theoretically explain through constructivism. However, there are all sorts of other things and events I know or sense are happening but all I can do is point to them. I have no means by which to describe them yet I desperately want to understand them.” Digging deeper, I was also conflicted with the idea that if “WE ARE CONNECTED TO THIS EARTH” (Thom, 2012, p. 2) then why is it that school mathematics feels so disconnected. These “things” and “events” were just a few of the items on what was becoming an ever-growing list. Many were contradictions I experienced between my home life and life lived as mathematics student and teacher. From ontologies to epistemologies to cultural discourses to the metaphorical nature of language to meanings of place. My hope was that these questions would be the start of a new journey for me. A journey that would require me to re(-)turn and explore the place of classroom mathematics and if necessary, bring forth possibilities for ‘re-rooting the learning space’ and develop an understanding for what it means to ‘mind where children’s mathematics grow’ (Thom, 2012).

Understanding Humility in Relation to the Boreal Forest (Florence)

I grew up on a ranger station in what is now called northeastern Alberta. My father was a forest officer and grew up in the prairies. My Métis mother was born and raised in the North primarily living in a variety of small communities around a huge fresh water lake. The ranger station was located on the edge of boreal forest and farmland. A boreal forest is full of deciduous and coniferous trees; land that includes muskeg (or bogs), freshwater lakes, rivers, and streams.

The land sustains a vast number of animal and plant species - species that also sustain human life. I grew up eating “wild meat” such as moose, deer, partridge, ducks, goose, and fish. I grew up picking and eating wild berries and learning about some medicines that were available in the forest.

I also grew up being in the boreal forest, learning from my Métis grandparents and from my parents about what it means to pay attention to the land. I grew up learning how to ‘find my way’ through the forest and learning to pay attention, for example, to the ways in which moss grows on trees as you might need the moss to build a fire for warmth. A large part of these early years was understanding forest fires. Forest fires were feared and at the same time celebrated. Forest fires were feared because of the way that they could impact human life. My father would be called away when a fire was spotted in order to begin to work with others on the initial attack; hoping that the fire could be contained in order to protect humans and human properties. At the same time there was a contradiction because a boreal forest relies on a forest fire for rejuvenation and growth. Nutrients are released, seeds are released for some species of trees, and fires open the canopy to allow new growth (Natural Resources Canada, 2022).

It was always fascinating to me to watch the way that a forest ‘rejuvenated’ following a fire. The years following a forest fire would mean that we needed to pay attention to reading the land in a different way because there would be new growth. You would notice the new jack pine seedlings that could now grow because of the fire. We would pay attention to the places that fireweed would grow across the burned area as fireweed was often the first ‘new growth’ we would see. We would spend time ‘reading’ the changes in the land after a fire and noticing the changes in the ways that the animals would live around the land that had been burned. Sometimes it would mean hunting in a new place for the moose or deer because the growth of the plants had changed because of the fire.

Often throughout these early years of my life we were taught to live with the forest because it was a way to learn about how to ‘survive’ with the forest. Even though we learned a lot about reading the land we also learned about respecting the land as the land can be changed quickly and dramatically by rain or no rain, fire or no fire, and extraordinary winds. Learning about ‘surviving’ taught me about humility; I was taught to respect the land, the weather, and the species that sustained our family. As I reflect on these early years now, I was learning about uncertainty and interdependence of humans and nonhumans living with earth or land.

South

TRUST IS THE spiritual by-product of innocence. My people say that innocence is more than lack of knowledge and experience, it's learning to look at the world with wonder. When we do that, we live in a learning way. Trust, the ability to open yourself to teachings, is the gateway for each of us to becoming who we were created to be. All things bear teachings. Teachings are hidden in every leaf and rock. But only when we look at the world with wonder do the teachings reveal themselves, and trust is also the ability to put those teachings to work in our lives. Trust is, in fact, our first act of faith and our first step towards the principle of courage that will guide us (Wagamese, 2011, p. 57).

Trust: Relations Take the Time it Takes (Cynthia)

As shapeshifters, Supernatural Beings appear in Haida stories told for generations. They're carved into poles, masks, and jewelry, and painted on bentwood boxes, woven into cedar hats, and tattooed on bodies. I've learned from Haida Elder Gwaaganad Diane Brown that it is here,

Haida Gwaii, where multispecies kinship between human and nonhuman, natural and Supernatural is honored – where, for example, “we treat the ocean as our relative.”

Supernatural Being Kugann Jaad (Figure 2) appeared for Haida artist Billy Yovanovich when working on his ideas for mathematics education on Haida Gwaii. It is Kugann Jaad, says Billy, who is known for her ability to restore balance and equity “with her strength, wisdom, and vision she guides us, speaking with both her hands and her eyes with knowledgment of what is to happen, what will happen, or even provide resources to meet challenging situations (Nicol et al., 2020, p. 17-18).



Figure 2. Kugann Jaad by Billy Yovanovich

Kugann Jaad for me helps tell the story of working with Haida communities, first as a beginning teacher, and then for the past 17 years as an academic to connect community, culture, and mathematics within the culture and place of Haida Gwaii. The task, when first started, seemed challenging but doable: work with six teachers (Indigenous and non-Indigenous; elementary and high school; from the north and southern parts of the Island; beginning and experienced) and the Principal of Indigenous Education to create practices and resources that ground and strengthen relationships between people, mathematics, and place. Teachers with more than 20 years of experience found themselves questioning their own assumptions, challenging what they noticed as deficit perspectives, and recognizing the complex work needed. We were excited about these modest results and humbled by the time it took. With community we took two years to develop a common workable set of questions that we called the PAIRS approach to highlight place, relationships and Indigenous storywork with mathematics, and another three years to develop a book as a collection of community Elders’ stories alongside mathematical adventures.

Our efforts seemed to move forward and backward at the same time. Off-Island teachers typically left the Islands within 5 years, new teachers joined the project, and the work would begin again. Kugann Jaad loves a good puzzle, and as shapeshifter can slip into the skins of others to lend a hand when needed. Perhaps it was Kugann Jaad who helped us accept that the strength of this work was felt not within a couple years, or 5 years, or even 10. It came with intergenerational teachings – when for instance I found the daughter of one of my former Haida students in my university teacher education mathematics class. I had taught her mom, her aunts, and some of her uncles, all of whom, I have since learned, shared with her their good stories of learning mathematics in my class many years ago. Now here she was in my university class eager and ready to embrace mathematics as a new teacher. Kugann Jaad reminds us to trust the time some learnings take.

Trusting Wonder (Jennifer)

“[O]nly when we look at the world with wonder do the teachings reveal themselves” (Wagamese, 2011, p. 57).

Wonder as Wagamese (2011) explains allows for an openness to the world, opportunity to receive its teachings, and inspires hope as well as promise to “live in a learning way” (p. 57). For me, his teachings evoke insights and sensibilities which resonate with 詩 (see also Figure 3). Pronounced “shi” in Japanese and Cantonese, 寺 can be interpreted as “tera (sic) [or] [E]arth/measure [as] ‘temple,’ a sacred place where one may be allowed to hear the true measure of earth beings, mortals in the nearness of divinity.” (Aoki, 2004d, p. 374) 言 is “to speak/to sound [w]ithin the ‘mouth’ that sounds forth or sings, over layered with three echoes and a lingering note.” (Aoki, 2004d, p. 374). 詩 expresses reverence and awe for Earth as place and teacher. Moreover, given the opportunity to learn by “listening to the land” (Glanfield et al., 2021, p. 258), “to hear the inspirited beat of earth’s rhythm” (Aoki, 2004d, p. 374-375) as “*land-guaging* algo-rhythms” (Glanfield et al., 2021, p. 258) opens possibilities for humans to speak and sound them forth into the world so they may endure. In trusting wonder, I am learning that “to [hear] and read the (con)texts of the natural world intimately and openly implies that ‘language ... is not a specifically human possession, but is a property of the animate earth, in which we humans participate’ (Abram, 2010, p. 11)” (Thom, 2019a, p. 252).

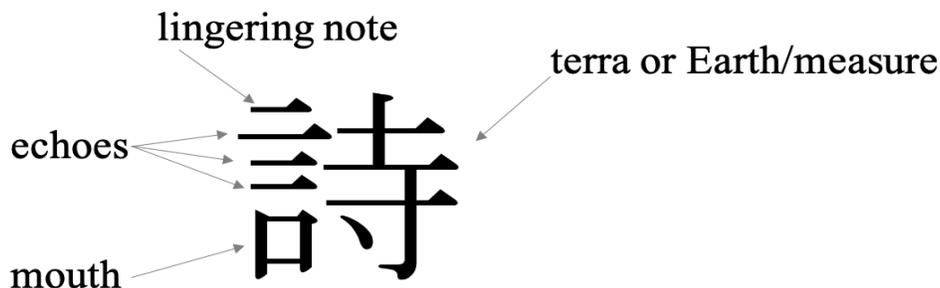


Figure 3. Chinese characters for “shi”

Doing so prompts me to revisit Alan Bishop’s “assertion that all human cultures ‘do’ mathematics—that is, count, measure, design, play, locate, and explain (Bishop, 1988)” (It’s Spring, 2022, p. 6). Here it is as if in its resurfacing, Bishop’s assertion asks to be re(-)turned. Wondering as Wagamese does and as 詩 implies, I wonder:

[W]hat [inspirited algo-rhythms might be heard if] such a focus [for mathematics education] recognizes not only human activities as mathematical but emphasizes ways of knowing, doing, and being which are inherently grounded in and come from the land and Earth [such as when]:

- ~ Sun and moon rise (and set)
- ~ Seasons change
- ~ Spiders web
- ~ Raindrops dance upon the water’s surface
- ~ Maple seedlings spin and spiral from tree to ground
- ~ Bat and fish and tree and pea tendrils ... just “know” where they are and how to get to where they need to be (It’s Spring, 2022, p. 6)
- ~ Humpback whales work together to net and feed.

What do I Trust (Florence)

The south direction in my life are the years that I was in formal postsecondary education. I first of all began to not trust as I was provided with implicit and explicit messages about silencing the teachings I had with my family in relation to the boreal forest. I wanted to be a mathematics teacher so when I finished high school I entered university to study mathematics first and then education second. Through those first two degrees I was taught a lot of different theories and practices. Theories about ways that children learned, theories about why humans act the way they do, theories about relationships, theories about the ‘best’ way to teach mathematics, theories about the best ways to assess student learning, and theories about the actions of the ‘best’ teachers. It felt like the years of formal education were a different world as I did not know or could not ‘see’ the ways in which the interdependencies that I learned about in my early years belonged in this world of theories that suggested an “if then” philosophy. That is, if x action is taken then y event will happen. This was contradictory to the philosophy that I grew up with as I was learning to ‘read’ the land, a philosophy that paid attention to interdependence and relationships.

As I began my teaching career I felt like I needed to implement all that I learned through my formal education. I often think about how, in my first 1.5 years of teaching, I spent hours and hours reviewing the “cumulative files” of each youth that were registered in my mathematics classes prior to the beginning of each school term. I did this because I believed that if I ‘knew’ about the youth in my classes then I could plan the ‘best’ program for each. I think about how I would spend hours and hours to make sure I could solve every mathematics problem in the assignments I planned to give because I thought that the “best” mathematics teacher was the mathematics teacher that had all of the correct answers. I think about how I would plan well in advance and how I wanted to keep up with my teaching colleagues in order to make sure I covered the curriculum in the same time frame. I wanted to quit teaching after those first 1.5 years because it was not anything like I had imagined.

As I began to learn about the youth that were with me in the classroom, I started to notice that the “cumulative files” didn’t really tell me anything about who the youth were as individuals. The “cumulative files” often shared information about what the youth could not do and rarely did those notes reveal what the youth could do. I began to wonder if I was thinking about the youth in a deficit way. I began to realize that all of my planning ahead did not pay attention to what was happening with each collection of humans in any one class. So while planning ahead was important I also noticed I had to be prepared for the different observations from the youth in each class. I realized that my planning ahead did not recognize the interdependence of a classroom. I began to realize that questioning my practices was moving me away from the predominant “if then” philosophy of my university years and moving closer to the “interdependence and relationship” philosophy of my early years.

West

ON THE MEDICINE Wheel, introspection is the "looks within place." Humility and trust offer many teachings, and introspection is a means of seeing how those apply to our lives. It's a place of vision. It's a resting place where the story, the song each of us has created up to this moment can be inspected and those things deemed unnecessary be let go. It's a place of courage, because the hardest place to look is within. Many people stop here, deterred by the trials of the journey and the sudden hurts that sometimes make life hard. But introspection is meant to bring us to balance. It is the place where all things are ordered, where all things ring

true at the same time. Balance allows us to move forward, and when we do, the journey becomes wondrous again by virtue of our ability to see the whole trail. (Wagamese, 2011, p. 107).

Introspection: What are you? (Cynthia)

At a community potlatch feast in a northern BC Indigenous community a young girl sitting next to me turned and proudly declared her heritage: “I’m Nisga’a!” Then, with what seemed an obvious question to her, and looking straight at me asked, “What are you?”

What am I? I could answer *who* am I? or *Where* are you from? But *what* am I? It’s taken a few years for me to learn how to respond to that question. Growing up as a non-Indigenous/settler in the Kootenay territory of southern British Columbia, in a predominantly white Euro-centric community, my heritage was rarely questioned and certainly invisible. We were taught nothing about the system of residential schools, lasting for over 160 years, involving more than 150,000 children in an education that offered more abuse than teaching. How is it possible that such atrocities occurred but then were erased from Canadian education? Even while I taught on Haida Gwaii these experiences were rarely spoken or only whispered.

My work with rural and Indigenous communities continues to deepen my own self-gaze to “disrupt molded images” (Dion, 2007), and settler colonial logics (Donald, 2012). This involves working with communities toward building relationships with land through personal experience, drawing upon stories and ancestral knowing through listening to Elders, and (re)membering respectful and responsive mathematical learning environments by connecting math, community and culture.

Through the teachings of Haida Elder Gwaaganad and Haida artist/activist Guujaaw I’m learning more about “what” I am. Gwaaganad spoke at our project meetings of the need to treat the ocean as our relative, as a member of the family. The ocean is neither an object, nor unending resource, nor even something that needs protection. The ocean is a relative, the ocean is kin. Similarly, Guujaaw spoke of the importance of ancient cedar trees to the Haida people. If “the trees are gone [due to industrial logging]” said Guujaaw, “then we’re just like everyone else.” The trees and the land including the ocean and waterways define what it means to be Haida.

Learning about relationships with the ocean and forests, as relatives, opened pathways for listening to the possibilities the land and waterways offer as teachers. Gwaaganad and Guujaaw led us in (re)membering long views of time and experiences of food harvesting with the changing ocean life, changing harvesting practices, and the revitalizing of ancient pedagogies of place. Opening myself up to embrace these kinds of obligations to the land/ocean, to be respectful and responsible for caring for the non-human world brings me closer to understanding what I am.

What am I? I’m still not sure I have a full response to this question, but I do know that it speaks to a more kincentric (Salmón, 2001) way of being, one that supports living in the world in more relational and emergent ways.

Simultaneous Complementarities (Jennifer)

"Introspection... 'looks within place.' ... [A] place of vision... where ... the song each of us has created up to this moment can be inspected [W]here all things ring true at the same time." (Wagamese, 2011, p. 107).

As I sit, “keeping watch” (Thom, 2012, p. 363), reflectively circling back and reflexively circling forth, I can appreciate and more deeply understand the onto-epistemological meanings of place that connect and (in)form my journey as mathematics education researcher. Now from the West, it is my Chinese grandfather’s family name 譚 “Tàahm” and my surname “Thom” that

appears, inviting my further contemplation. Similar to 詩 or “shi”, 言 depicts a mouth which sounds or sings forth, echoes, and holds a lingering note. 覃 translates as “early west.” (see also Figure 4). (How curious it is that 譚 foretells my grandfather’s journey from Hoiping China to Vancouver Island, singing forth as it echoes my family’s history in the “early west” during the turn of the 20th century onward.)

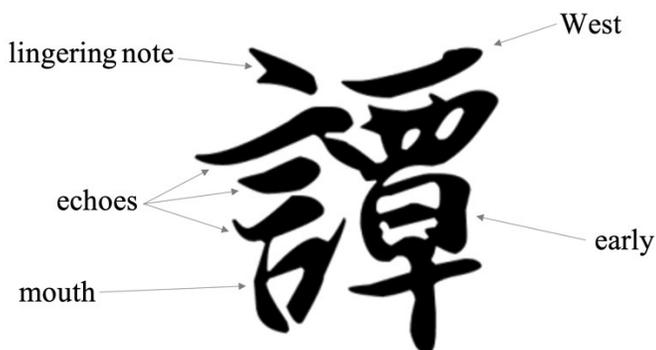


Figure 4. Chinese characters for Tàahm/Thom

Looking again, the Chinese characters for West bare other meanings which suggest reflection. For example, “dusk” as the time of day when the sun disappears below the horizon and the season of autumn. Both resonate with Wagamese’s description of West as “a resting place” and “a place of vision” that affords “look[ing] within place” and “introspection” (Wagamese, 2011, p. 107). Perhaps more intriguing is how the idea of “early west” presents as “all things ring[ing] true at the same time.” (Wagamese, 2011, p. 107). That is, *sunrise* and *sundown*; *early* or *soon* and *late*, *morning* and *evening*; even *beginning* and *end*. And as well, while autumn signifies a time of ripening, harvest, and plenty, it is also a time of decay, death, and decline.

These ‘opposites’ which could be viewed as contradictory can also be understood as wondrous spaces in which to “see the whole trail” (Wagamese, 2011, p. 107). Not as distinct or separate parts that compete with one another but in the harmonious *and* discordant ways they come together to dialectically (in)form “a space of conjoining and disrupting, indeed, a generative space of possibilities, a space wherein in tensioned ambiguity newness emerges.” (Aoki, 2004b, p. 318). So understood, dwelling within such edgy yet fecund spaces inspires my inquiry and occasions my learning into: how STEM *and* the cultural commons (Bowers, 2016) enable eco-centric intelligences within communities (Thom, 2019b); conceptualizing modern *and* ecological discourses in ways other than an impasse (Thom, 2021); alternative meanings and purposes for STEM within Indigenous *and* ecological perspectives (Glanfield et al, 2021); dynamics of mathematical ideas as individual *and* collective phenomena (Thom, 2012); mathematical drawings as act *and* artifact (Thom & McGarvey, 2015); mathematical perception *and* representation (Thom et al., 2021); and bodily experiences *and* mathematical conceptions (Thom, 2017, 2018; Thom et al., 2015; Thom & Hallenbeck, 2021; Thom & Pirie, 2002; Thom & Roth, 2011).

Indigenous Knowledge Systems and University Teachings (Florence)

I turn to university and to teachings of Indigenous knowledge systems in the west. After years of teaching I return to study a graduate degree in educational administration as I want to learn more about schools and how schools and school systems come to see youth as deficit. I imagine that I will become a school administrator that will make a change in the school system. I

never become a school administrator. When I finish the graduate degree I begin to work with the provincial ministry of education in developing and implementing provincial mathematics programs and developing student assessment materials. I also began to notice that who I am as an Indigenous person made a difference when I was working with communities across Northern Canada around mathematics programs. I remember being invited to sit with Indigenous community members in the northwestern part of the Northwest Territories, outside of the normal mathematics program activities, when the community learned I was Métis. At another community in the Northwest Territories an Elder talked with me about how the number system in the Dene dialect was not a base 10 system when she learned I was Métis. The Elder told me about how numbers were important in communities traditionally but that it was about ‘enough’ and not always needing ‘more.’ These were ideas that I had not previously learned. Indigenous community members would tell me how they were working to have Indigenous languages present within schools. I was asked about the languages that my family spoke and I began to inquire within my family about the Indigenous languages that were spoken, as I could not remember Indigenous languages being spoken.

What I was learning through my living is that the predominant “if then” philosophy so evident in much of my formal education and the policy work was being replaced in my living with the “interdependent relational” philosophy of my early years. As I entered into a PhD program I searched for theoretical frameworks and methodologies that more closely aligned with an “interdependent relational” philosophy. The searching was not easy; but I had the opportunity to learn about narrative inquiry (Clandinin & Connelly, 2004) and an enactivist view of cognition (Maturana & Varela, 1992; Varela, Thompson & Rosch, 1991). These views ‘aligned’ with what I was learning from Indigenous knowledge holders as I was making sense of doctoral studies and aligned with an “interdependent relational” ontological stance.

North

TO BE TRULY wise is to understand that knowing and not knowing are one. Each has the power to transform. Wisdom is the culmination of teachings gleaned from the journey around the circle of life, the Medicine Wheel. Circles have no end. We are all spirit, we are all energy, and there is always more to gain. This is what my people say. When the story of our time here is completed and we return to spirit, we carry away with us all of the notes our song contains. The trick is to share all of that with those around us while we're here. We are all on the same journey, and we become more by giving away. That's the essential teaching each of us is here to learn. (Wagamese, 2011, p. 151).

Our journeys traveling through Wagamese’s Medicine Wheel teachings, East (humility) to South (trust) to West (introspection) bring us to North (wisdom) and our questions of what this journey means for mathematics education. We are aware of the colonizing role mathematics and mathematics education has played and continues to play as “one of the most powerful weapons in the imposition of Western culture ... [and] a secret weapon of cultural imperialism” (Bishop, 1990, p. 51). And so, we ask: How does (re)membering place give rise to discourses and actions that are both resonating harmonies and critically dissonant in mathematics education? How can (re)membering place help challenge more dominant ways of being in relation – from exploitation, violence and oppression over land, animals, humans, language and cultures (Calderon, 2014; Seawright, 2014) to more intimate experiences of dwelling together humans and more-than-humans for the wellbeing of all (Abram, 2011).

We acknowledge calls in the literature to re-imagine mathematics education to address current global challenges (e.g., Adams, 2018; Barwell, 2018; Glanfield et al., 2019; Nicol et al., in press; Wolfmeyer et al., 2017). For instance, critiques of educating for STEM, are gaining attention in teacher education (Khan, 2020; Nicol et al., 2020), curriculum (Wolfmeyer et al., 2018a; Thom, 2021) and communities (Thom, 2019b; Wiseman et al., 2020); design (Glanfield et al., 2020), interdisciplinarity (Yaro, Amoah & Wagner, 2020), social justice (Davis & Renert, 2013; Wolfmeyer et al., 2018b); and mathematical formatting (Barwell, 2018; Skovsmose, 2021).

In addition, there are calls to address issues such as equity and the need to rehumanize mathematics education (Gutiérrez, 2017, 2018); to teach and assess in ways that build upon the strengths of students from marginalized groups and communities (Aguirre & del Rosario Zavala, 2013; Celedón-Pattichis, Musanti & Marshall, 2010); and to recognize intersectionality (Bullock, 2017; Gholson 2016).

Yet, with Wagamese (2011), we have traveled the four directions to offer narratives for mathematical ways of being that support a more holistic engagement with human and natural environments. Where place, and land, is teacher.

In the Chinese language:

wisdom is inscribed in a family of words: *human, humility, humus, and humor*, all etymologically related as they are, too, in our language. The Chinese characters of a wise leader read *sei-jin* 聖人—a person who, indwelling with others 人, stand between heaven and earth 土, listening 耳 to the silence, and who, upon hearing the wor[ld], allows it to speak 口 to others so others may follow. (Aoki, 2004c, p. 214).

What kind of a place is this? A place where there is room for words like *humor, human, humus, humility* to live together. In such a place, to be humiliated is to be reminded that we are communally ecologic, that the rhythmic measures of living [with] Earth come forth polyphonically in *humor* and *human* and *humus* and *humility*. (Aoki, 2004a, p. 300)

We end as we began with questions ...

1. What are the conditions that make possible ethical and rigorous engagement across communities in resonant harmonies and critical dissonances that can help us move together towards improved relationships and wiser futures, as we face unprecedented global and local challenges?
2. What are some guidelines, approaches, and practices for ethical and respectful engagement with communities that can help us to work together in holding space for each other human and more-than-human in the place of mathematics education?
3. How do we learn together, to co-construct and learn to be with each other, the land and our more than human kin, in ways that are compassionate, sensory, interconnected, and with humility, courage, wonder and trust in caring for life over the long haul? And what is the role of mathematics education in this?

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