

**Education as Cultural Healing and Empowerment:  
Spaces for Learning in the Context of Anishinaabe Communities  
Surrounding the Georgian Bay**

by

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## **ABSTRACT**

This thesis seeks for cultural healing and empowerment through learning spaces reflective of Anishinaabe worldviews. The program responds to current efforts by the Anishinaabe people surrounding the Great Lakes to develop an educational system that preserves and promotes their cultural identity in a contemporary world.

To develop a basis for the context of this thesis I researched the history of systematic oppression of First Nations culture through education, the Great Lakes' role in connecting communities by the water, and First Nations' traditional worldviews and teaching techniques. Looking to the past was equally as important as analysing current cross-cultural case studies in order to root the design in Anishinaabe culture that is also relevant to the contemporary architectural discourse.

## GLOSSARY

*Anishinaabe* is the autonym for a group of culturally-related indigenous peoples of Canada and the United States that include the Odawa, Ojibwa, Potawatomi, Oji-Cree, and Algonquin peoples.

*Biophilia* is the human tendency to seek connections with nature and other forms of life.

*Climate Determinism* is the study of how the physical environment determines the patterns of human culture and societal development.

*Interdependence* is the dependence of two or more livelihoods on one other.

*Material culture* refers to the physical objects, resources, and spaces that people use to define their culture.

*Pedagogy* is the study of the theory and practice of teaching.

*Place-based education* promotes learning rooted in the local—using the local community as a primary source for learning in order to ground ourselves and develop a deep knowledge of place before moving to broader, more globalised subjects.

## **ACKNOWLEDGEMENTS**

This thesis is dedicated to the Great Lakes and its people whom these waters breathe life into. I could not be prouder to call the Georgian Bay my home.

To Richard Kroeker, your teachings over the past year have proven invaluable. I only hope I have been able to make even half of the impact on you that you have had on me.

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To Dr. Wayne R. Watson and all who helped establish the John D. Watson Memorial scholarship, your generosity has made all the difference to my final year of study. Without this scholarship, I would not have the wonderful experiences that served as inspiration for this work.

To my fellow classmates throughout the years, it has been emotional.

Finally, to my family and friends, I must express my sincere gratitude, both for providing me with unfailing support throughout my educational career and, perhaps more importantly, for letting me sleep until noon everyday. The continuous encouragement I received throughout this chapter of my life has made this thesis possible.

Chi-miigwetch

## CHAPTER 1: INTRODUCTION

I have spent most of my childhood outdoors along the shores of the Georgian Bay in Shebanoning (Killarney), Ontario. Much of it unsupervised. Alone. And so, in many ways, the forest and the Georgian Bay waters became my family. I learned to *see* life and value in the inanimate, the worthless, the invisible.



Welcoming Ceremony for the Water Keepers of the Nibi Onji Canoe Journey at the 2016 Great Lakes Gathering.

Beyond my upbringing, this thesis has been more recently influenced by my experiences at the Great Lakes Gathering hosted by Garden River First Nation in July 2016 and a two-week field trip along the northeastern shoreline of the Upper Great lakes in August 2016 funded by the John D. Watson Memorial Scholarship. The interactions with the people of the shoreline communities during my field trip and the people of the Great Lakes Gathering have served as tremendous inspiration for this work. Anishinaabe Elder Josephine Mandamin states:

This four-day ceremonial gathering is a direct action for our sacred waters. We must continue to gather, pray and walk for the water until we know water will be cared for and protected.<sup>1</sup>

1 Josephine Mandamin, “Statement on the Great Lakes Gathering” (speech presented at the Great Lakes Gathering, Ojibway Park, Garden River First Nation, Ontario, July 14, 2016).



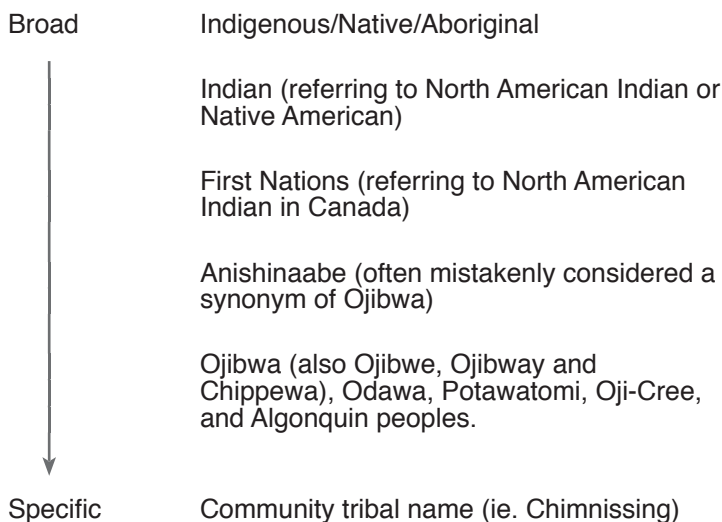
John D. Watson Scholarship field trip, August 2016

## **Thesis Question**

How can a vessel-based school system be used to create a culturally relevant space, pedagogy, and environment for connecting Anishinaabe children of the Great Lakes to their ancestral language, traditions, landscapes and animal world as well as infiltrate and colour the existing school system in Canada?

## **Design Principles**

- Use the water to improve access to education in remote communities
- Provide Anishinaabe educators and Elders with spaces that can adapt to different types of learning
- Take advantage of seasonal changes and use the surrounding natural environment as a resource for learning
- Stand in opposition of water and land ownership through occupation of the Lakes.
- Use local or salvaged materials and easy-to-teach methods for construction to boost community skillsets and foster self-sufficient economies
- Use wood in-the-round to maintain its full structural integrity and oppose current wood industry certification process
- Think through making
- Use the circle as an organizing strategy

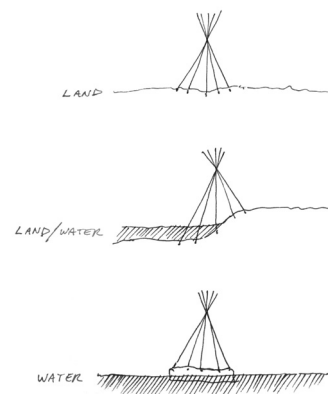


For the purpose of illustrating the variety of terminology used to describe indigenous peoples, I will not edit the direct quotations of authors in this text. I will use the terms Native, Native American, First Nations, Anishinaabe, Great Lakes people and specific community names to refer to different peoples throughout this document. It is important to keep in mind that although most communities identify under a distinct tribal name, the resident population contains many people connected with other tribes and cultures.

Additionally, although reserves are an accurate way to identify populations consisting mainly of First Nations people, many communities not under the “Indian Reserve” designation (1876 Indian Act of Canada) maintain large populations of First Nations people, both “Status and non-Status Indians” (1876 Indian Act of Canada). For the sake of certainty of heritage, the right to self-government, the need for undeveloped forested lands for education, and the necessity to be located along the Great Lakes shoreline, 7 shoreline “Indian reserves” have been chosen as the initial communities for the vessel-based education system presented in this document.

I had a dream that all the people of the world were living together in one place. The place was cold. Everyone was shivering. I looked for a fire to warm myself. None was to be found. Then someone said that in the middle of a gathering of Indians, what was left of the fire had been found. It was a very, very small flame. All the Indians were alerted that the slightest rush of air or the smallest movement could put the fire out and the fire would be lost to humankind. All the Indians banded together to protect the flame. They were working to build a fragile, feeble flame.

Suddenly, throughout the other peoples, the whisper was heard. 'The Indians have a fire.' There was a crush of bodies stampeding to the place where the flame was held. I pushed to the edge of the Indian circle to stop those coming to the flame so it would not be smothered. The other people became hostile saying that they were too cold and it was our responsibility to share the flame with them. I replied 'It is our responsibility to preserve the flame for humanity and at the moment it is too weak to be shared but if we all are still and respect the flame it will grow and thrive in the caring hands of those who hold it. In time we can all warm at the fire. But now we have to nurture the flame or we will all lose the gift.'<sup>2</sup>



Sketch. The nomad between land and water.

<sup>2</sup> Cecil King, "Here Come The Anthros" (paper presented at the 88th Annual Meeting of the American Anthropological Association, Washington, DC, 1989).



## CHAPTER 2: HISTORICAL AND CULTURAL CONTEXT

### 2.1 Suppression of Indigenous Knowledge

In order to develop the context of education in the Great Lakes region, it was important for me to understand the history of suppression of indigenous knowledge through the Western education system as well as its lasting legacy leading up to its current situation. James Youngblood Henderson outlines the federal government's breach of treaties from the late 1800s into the mid 1970s and how, under the guise of "advisable education", the Canadian federal government infiltrated the First Nations traditional education system and imposed foreign culture, values and language which led to the destruction and near eradication of First Nations culture.<sup>3</sup> Linda M. Goulet and Keith N. Goulet share similar perspectives but place a much heavier focus on colonization and the institutionalized racism that continues to plague indigenous children in the contemporary education system. Edward Jefferson Danziger Junior mirrors Henderson's stance on the federal government's education policy when he describes it as the "Education Crusade" in which the classroom became the new battleground. Unlike Henderson, however, Danziger focuses less on the treaties and more on the role of Christian missionaries in dominating First Nations education. In Ontario for example, Ottawa continued to contract with religious institutions in the use of day and boarding schools long after the United

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3 James YoungBlood Henderson, "Treaties and Indian Education," in *First Nations Education in Canada: The Circle Unfolds*, ed. Marie Battiste and Jean Barman (University of Washington Press, 1995), 245-261.

States abandoned these partnerships in the 1890s.<sup>4</sup> At the same time, Danziger paints the relationships between First Nations people and the boarding schools in a more positive light than the aforementioned authors. True, the boarding schools left a crippling emotional legacy on children that left them unable to function properly in either the Native or Western World, but in many cases of the Great Lakes First Nations, parents only supported these education systems for as long as seemed beneficial to their children and some ignored them altogether. Despite the urgency of the federal government to assimilate these populations into Western culture, they were not entirely prepared for the pushback they received from many communities. Even more unexpected was their sheer determination to keep their options open even when they were severely in need of new skills to live in a Western dominated culture.<sup>5</sup> As Danziger eloquently puts it, “Their moccasins were about to enter the mainstream but Indians would not be swept away by it.”<sup>6</sup> This alternate perspective is important because it reminds Great Lakes First Nations people of the position they stand in - one with the proven strength to withstand the imposition of foreign culture and the potential strength to alter its course.

## 2.2 The Lasting Legacy

Marie Battiste describes 1969 as the critical year in which Canada’s federal government announced the so-called *White Paper Policy* that gave the provinces control of First Nations education on reserves. The policy

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4 Edmund Jefferson Danziger, *Great Lakes Indian Accommodation and Resistance During the Early Reservation Years, 1850-1900* (Ann Arbor: University of Michigan Press, 2009), 123-154.

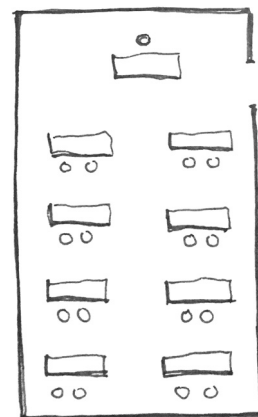
5 Ibid., 154-155.

6 Ibid., 27.

ultimately became a tool for the Department of Indian Affairs and Northern Development (DIAND) to transform young Aboriginal minds rather than educate them. The new Eurocentric education practices completely rejected First Nations worldviews and Battiste argues that the legacy of these practices combined with a lack of resources or authority to implement necessary services, an overall resentment toward government, a lack of accountability, and low self-esteem, among other things, led to the failure of the accepted *Indian Control of Indian Education* policy paper in 1973 – an objection to the 1969 policy by Aboriginal peoples in order to ‘salvage’ their remaining language, culture and societies through Indian Education.<sup>7</sup> As Battiste puts it,

Aboriginal communities that have assumed control of their schools are still plagued by questions of how to implement Indian education in the twenty-first century: What goals and outcomes are important? What processes must accompany cultural and linguistic development and inclusion? What is the meaning of renewal and revision in the contemporary and traditional educational context? How do we represent our cultures in schools? What is appropriate, meaningful, and necessary? Should we teach and evaluate in traditional Aboriginal ways or adopt contemporary Eurocentric models of education to achieve a diversity of goals? How can Aboriginal communities be healed of past tragedies? How can cultural and linguistic integrity be achieved?<sup>8</sup>

Battiste’s perspective is echoed by many indigenous leaders, educators and historians. It illustrates an underlying resistance to Western forms of education but also an inherent need to strengthen cultural identity and start a conversation about what it means to bring First Nations education into the twenty first century. Conventional classroom layouts and the



Sketch. Conventional Eurocentric classroom layout showing hierarchical relationship between teacher and student

<sup>7</sup> Marie Battiste, “Introduction,” in *First Nations Education in Canada: The Circle Unfolds*, ed. Marie Battiste and Jean Barman (University of Washington Press, 1995), viii-xiv.

<sup>8</sup> *Ibid.*, xiv.

typical master/apprentice relationship between teacher and student represents only a small portion of traditional First Nations education and will serve primarily as an overlap between First Nations and Western educational practices for this project.

Danziger states,

We are burdened by past actions that resulted in weakening identity of Aboriginal peoples, suppressing their languages and cultures, and outlawing spiritual practices. We must recognize the impact of these actions on the once self-sustaining nations that were disaggregated, disrupted, limited or even destroyed by this disposition of traditional territory, by relocation of Aboriginal people, and by some provisions of the Indian Act. We must acknowledge that the result of these actions was the erosion of the political, economic, and social systems of Aboriginal people and nations.<sup>9</sup>

This is not to say that these systems cannot be rebuilt but that they must be given the time and support to do so.

Cajete presents an additional challenge brought about by these actions when he says,

Over the course of contact between European and Native American cultures, the sustained effort to 'educate' and assimilate Native Americans as a way of dealing with the 'Indian Problem' inevitably played a key role in how Native Americans have historically responded to American 'schooling.' As is true with many 'colonized' cultural groups throughout the world, the first attempts were met with resistance. The resistance to schooling continues today in varied and psychologically submerged forms.<sup>10</sup>

Clearly community support is not guaranteed, and with good

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9 Danziger, *Great Lakes Indian Accommodation*, 27.

10 Gregory Cajete, *Igniting the Sparkle: An Indigenous Science Education Model* (Skyand, NC: Kivaki Press, 1999), 26.

reason; however, it can be encouraged by learning to listen first before speaking.

Part of this resistance to schooling stems from the standardization and rapid implementation of “successful” approaches across numerous regions without listening to the individual needs of each community and, even worse, without any attempts to tap into the local skillset and inherent strengths of the community necessary for inspiring the confidence needed to move forward after the project has been built. In the same way that First Nations cannot accept broad stroking of culture (even when the differences seem minute), a successful design approach must be adaptable to each community and must offer solutions that play to their unique passions and abilities.

## CHAPTER 3: TRANSFORMING PAIN INTO STRENGTH

The question, once again, involves deciding what must be adopted from the outside culture, what must be adapted to, what must be retained in its original purity from traditional times and what must be returned to that state.<sup>11</sup>

### 3.1 Defining Dialectical Worldviews: Eurocentric vs. Native Science

In negotiating between the local and global, it is important to distinguish the difference as well as the similarities between Eurocentric and Native Science that influence our worldviews. Gregory Cajete and Leroy Little Bear form a good basis for understanding the differences through a comparison of the Eurocentric construct of Science with Native perspectives of interdependence. In simple terms, the major difference between the two is that in Native “science”, objects or phenomenon are not isolated before study. Instead, they are understood in terms of relationships.<sup>12</sup> In that same breadth, “Native Science is born of a lived and storied participation with the natural landscape.”<sup>13</sup> It is worth noting, that this distinction between the two perspectives only scratches the surface. In fact, it is quite ironic to try to define Native Science when “science” is fundamentally a Western construct. Nonetheless, there is a growing number of voices seeking to both define and mediate these two worldviews, myself included. Mi’kmaq Elder Albert Marshall’s guiding principle of Two-Eyed Seeing is a perfect metaphor for mediating between the two and

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11 Rupert Ross, *Dancing with a Ghost: Exploring Indian Reality* (Toronto: Penguin Books Canada, 2006), 113.

12 Gregory Cajete and Leroy Little Bear, *Native Science: Natural Laws of Interdependence* (Santa Fe, NM: Clear Light Publishers, 2000), 2-9.

13 Cajete and Little Bear, *Native Science*, 2.

shifts focus towards celebrating multiple perceptiveness as a gift. “Two Eyed Seeing refers to learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing, and to using both these eyes together, for the benefit of all.”<sup>14</sup> Although this thesis is primarily focused on strengthening Anishinaabe cultural identity, the proposed vessel-based education system places the conventional Western learning style (master/apprentice) within the six categories of indigenous learning outlined in section 3.4.

Barnhardt and Kawageley say, “Our challenge now is to devise a system of education for all people that respects the epistemological and pedagogical foundations provided by Indigenous as well as Western cultural traditions.”<sup>15</sup> The aim here is to provide the architecture that supports the development of an education system for Anishinaabe communities at first and for the broader population as soon as it has become fully established.

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14 Cheryl Bartlett, Murdena Marshall, Albert Marshall and Marilyn Iwama, “Integrative science and two-eyed seeing: Enriching the discussion framework for healthy communities,” in *Beyond intractability: Convergence and opportunity at the interface environmental, health and social issues*, ed. L. K. Hallstrom, N. Guehlstorf, and M. Parkes. (Vancouver, BC: UBC Press) (forthcoming).

15 Ray Barnhardt and Angayuqaq Oscar Kawagley, “Indigenous knowledge systems and Alaska Native ways of knowing” *Anthropology and Education Quarterly* 36 (2005): 10.

### 3.2 Defining Site: A Historical Connection to the Water

The proposal to develop learning spaces accessible by water is rooted in traditional nomadism of Great Lakes First Nations and hinges on a call-to-action by Elders of the 2016 Great Lakes Gathering to return to the water. The act of *returning to the water* is a means of reconnecting culture to the region from which it evolved. Occupancy of the Lakes reinforces awareness of our interdependence with the surrounding natural environment and, in that same action, rejects the Western concept of land/water ownership that perpetuates a false dualism between humans and nature. “In 1691, an Algonquian told a Frenchman who was trying to persuade him to adopt a European house, ‘... we can always say, more truly than thou, that we are at home everywhere because we can set up our wigwams with ease wherever we go and without asking permission of anybody.’”<sup>16</sup>

Danziger describes how First Nations peoples’ respect towards the Great Lakes is reflective of an intimate knowledge and kinship that came with extended residency. Not only did the Great Lakes support the semi-nomadic lifestyle of northern communities that relied on mobile subsistence strategies but it also fostered a vast communication and trading network that supported the transmission of customs and technologies between communities as well as intermarriage and military alliances.<sup>17</sup>

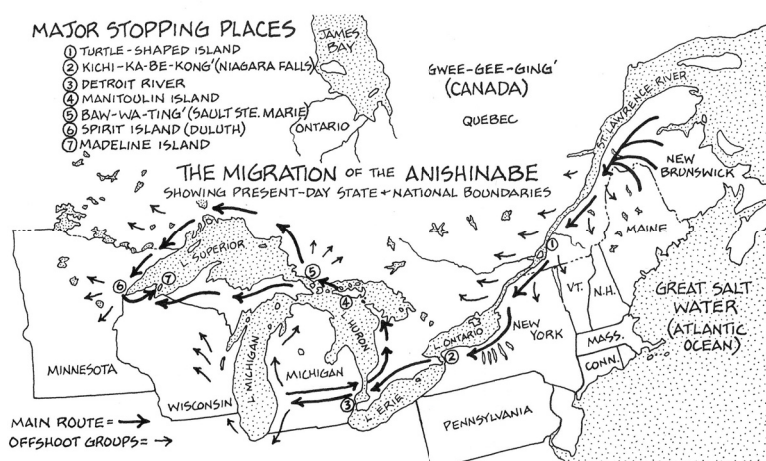
Tanner approximates the Great Lakes to modern highways and explains how many of the sites of trading posts, towns and forts were chosen at important portage

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<sup>16</sup> Peter Nabokov and Robert Easton, *Native American Architecture* (New York: Oxford University Press, 1989), 57.

<sup>17</sup> Danziger, *Great Lakes Indian Accommodation*, 2-4.





*The Migration of the Anishinabe* map showing routes and major stopping places of the Anishinabe people on their journey to the West; from *The Mishomis Book*.

points or junctures in the waterways.<sup>18</sup> The origins of the Anishinabe of the Great Lakes remains a contested subject. Tanner divides the origins of the people of the Great lakes into 3 categories: residents, refugees (primarily from the Atlantic coast), and allies or opponents from south or west of the Great Lakes.<sup>19</sup> The second category of refugees is expanded upon by Edward Benton-Banai in his description of the Anishinabe migration from the Atlantic Coast spurred by the dangerous onslaught of early European colonizers. Several major stopping points are marked along the primary route that took the Anishinabe from the Atlantic Ocean through the St. Lawrence River into the Southern Great Lakes and then Northward into Lake Superior.<sup>20</sup> According to William W. Warren, the ethnic identities of Ojibwa, Ottawa, and Potawatomi developed after the Anishinabe

18 Helen Hornbeck Tanner and Miklos Pinther, *Atlas of Great Lakes Indian History* (Norman: Published for the Newberry Library by the University of Oklahoma Press, 1987) 6-7.

19 *Ibid.*, 2.

20 Edward Benton-Banai, *The Mishomis Book: The Voice of the Ojibway* (Hayward, WI: Indian Country Communications, 1988), 99.



Map of Ontario Indian Reserves along the Great Lakes Shoreline and the selected site for this project; base map from Aboriginal Affairs and Northern Development Canada.

reached Michilimackinac (present day Mackinac Island) on their journey westward from the Atlantic coast. These three ethnic identities form the Council of Three Fires.<sup>21</sup> Often identified as Anishinaabe, but not part of the Council of Three Fires, are the Nipissing, Mississaugas, Algonquin and Oji-Cree nations. In any case, there is plenty of evidence to support the fact that Anishinaabe people have occupied the shorelines of the Great Lakes for centuries and their lives have indisputably been shaped by its water.

A major goal for this thesis is the rekindling of alliances across the Great Lakes as well as the restoration of self-sufficient communities through the use of local materials and knowledge. I chose the locality of the Georgian Bay within Lake Huron for my research for three reasons. The first is because the intention of this project is to link communities by water and the Georgian Bay site provides a better historical reenactment of linkage than any other place along the Great Lakes due to the number and close proximity of these communities. The second is because I

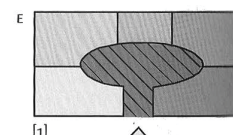
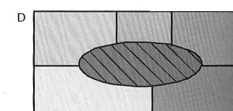
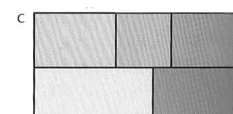
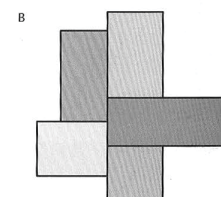
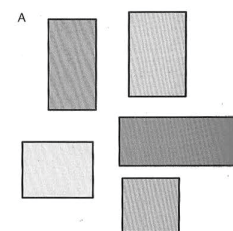
<sup>21</sup> William W. Warren, *History of the Ojibway People* (St. Paul, Minnesota Historical Society Press, 1984), 81-82.

spent my youth growing up along the Georgian Bay shoreline in Killarney, Ontario and therefore, can appreciate the need for increased water transportation and also the value of this environment beyond whatever products/revenue come out of it. The third is because Catholic schools still dominate the publicly-funded school system in Northeastern Ontario and rarely do they address Native culture. In my personal experience in Catholic schools from elementary through to high school, these schools are very limited in styles of learning and alternate forms are needed to serve the broader population.

The following Site Strategy Map illustrates the concept of six mobile education vessels on rotation during the summer months that provide education to seven shoreline Indian Reserves along the Georgian Bay. Each vessel is catered to one of Gregory Cajete's six categories of learning outlined in section 3.4. For example, one vessel includes snowshoes for Experiential Learning and the vessel dedicated to Ritual/Ceremony maintains a larger gathering space for dances and ceremonies. In this way, students get the chance to learn in a variety of ways without the need to construct a full school for each community.

A seasonal Winter Pow Wow gathering located centrally on the Georgian Bay during the winter freeze-up is important for creating a sociocultural complex similar to that of the Extended Schools described by Herman Hertzberger.<sup>22</sup> The atmosphere of togetherness created by large gatherings acts to counter feelings of isolation felt by these remote communities and also encourages

<sup>22</sup> Herman Hertzberger, *Space and Learning: Lessons in Architecture 3* (Rotterdam: 010 Publishers, 2008) 169-172.

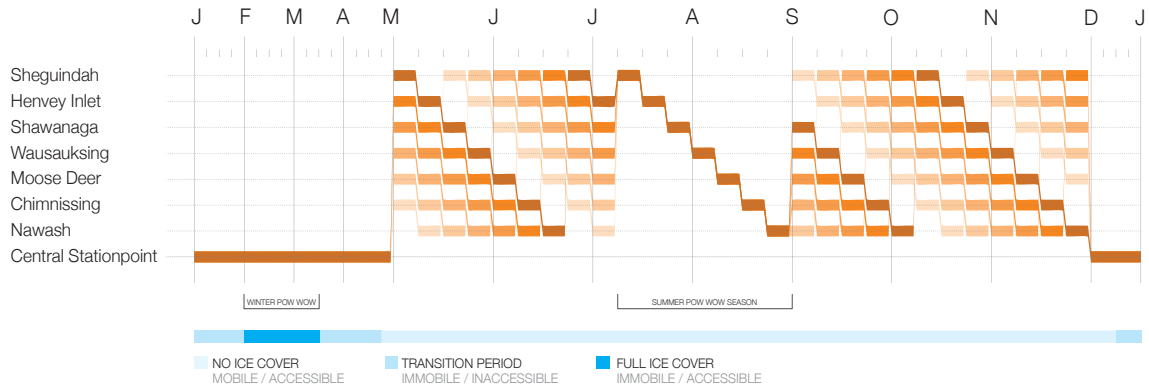


*Extended School* diagram representing the gathering of several schools in a single complex with shared community space; from Herman Hertzberger's *Space and Learning*.



Site Strategy Map illustrating summer and winter paths of travel for proposed education vessels; base map from ArcGIS.

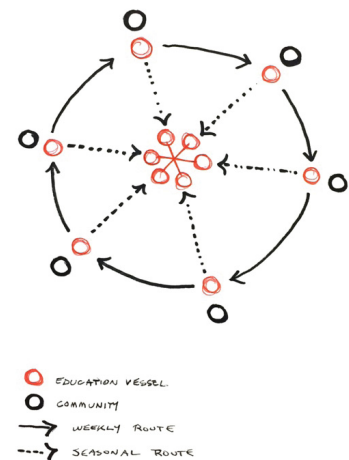




Proposed vessel schedule by week showing rotation and gathering of six education vessels. Ice coverage data sourced from NOAA Great Lakes Environmental Research Laboratory.

greater collaboration between groups. For participants, the gathering is treated much like a summer camp program where they stay for the duration of the festival. In the event that the Georgian Bay ice cover does not support safe travel (which is becoming more and more common due to climate change), the communities will be expected to choose a host community for the Winter Pow Wow gathering that everyone can shuttle to or simply wait until the following year.

Beyond the winter freeze-up these vessels also come together for Pow Wow celebrations (defined in section 3.5) hosted by each community during the summer months. These are already coordinated not to overlap the dates of other community Pow Wows so as to encourage every community to participate in each gathering.



Sketch. Representing the rotation of education vessels during summer months and the central station point during the winter freeze-up.

### 3.3 Defining Accessibility: The Decentralised Approach to Remote Communities

The most destructive aspect of the residential school policy in Canada was the removal of children from their physical and social place which resulted in students losing their connection to the land, the community and their



Sketchmodel. Representing joinery of 6 vessels.



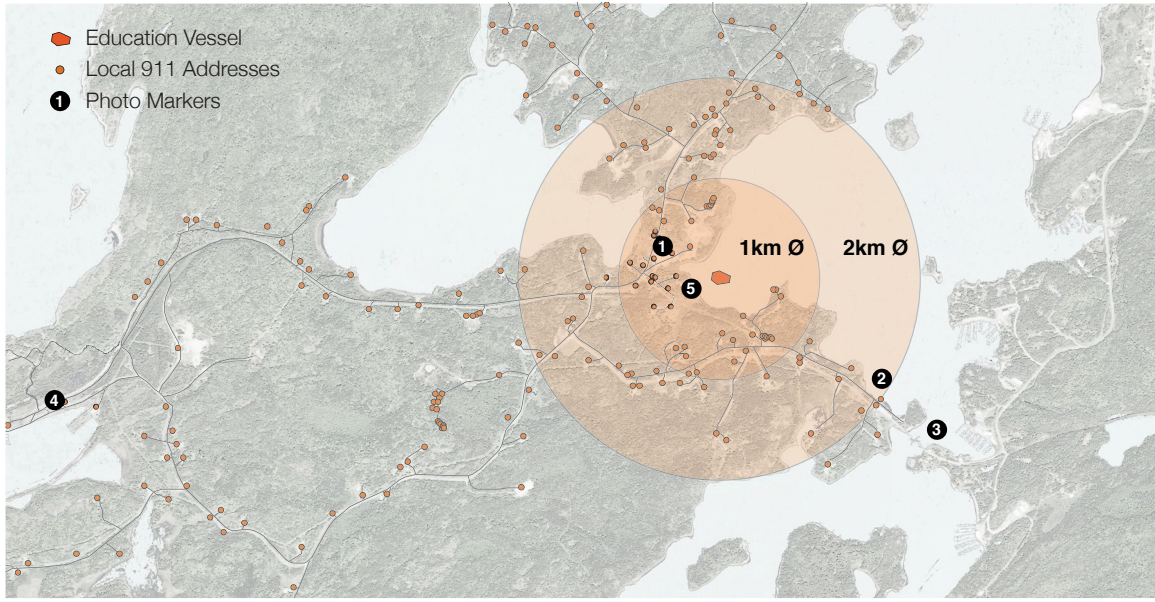
Photomontage. Example of pickup site using existing barrel docks.

family members.<sup>23</sup> For this reason, this thesis aims to bring education to the children and provide the opportunity for local knowledge of the surrounding community to be celebrated and passed on. Floating classroom vessels will be docked at central locations within walking distance of the majority of students' households. Below is a prototypical example of access at Wasauksing First Nation. The other selected communities are similarly clustered around the shoreline and can easily be accessed by a short walk/bike ride of a few kilometres. I chose the most central and most sheltered area to develop a sketch model but the major advantage of these mobile vessels is their ability to easily latch onto existing infrastructure and natural shorelines.

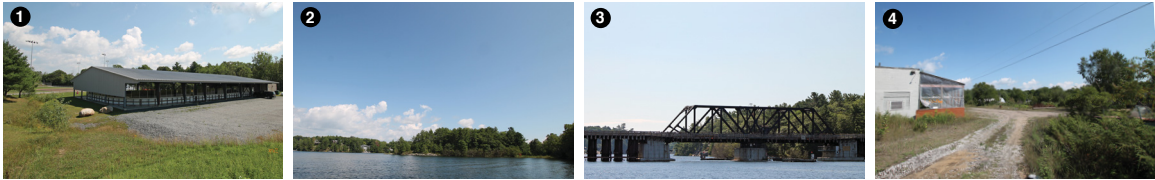
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<sup>23</sup> Linda Goulet and Keith N. Goulet, *Teaching Each Other: Nehinuw Concepts and Indigenous Pedagogies* (Vancouver: UBC Press, 2014), 202.





Prototypical Site Access at Wasauksing First Nation; base map from Wasauksing First Nation Lands Department.



Sketch model. Wasauksing pickup site showing existing natural shoreline and typical on-post dock.



Diagram. Six Categories of Indigenous Learning including respective program requirements.

### 3.4 Defining Program: Decolonizing Education using the Six Categories of Indigenous Learning

Ironically, Canada often prides itself on “multiculturalism” which implies the celebration and equal respect of various cultures. How can this be when the public education system is based on so few styles of learning from only the dominant cultures? The fusion of several styles of learning, or Two-Eyed Seeing as described previously, should serve as precedent for the integration of more learning styles as our society moves forward. If we can promote the value of biodiversity, why not diversity



in education which provides every student the chance to pursue their educational interests regardless of background, affluence or race?

In an attempt to “decolonize” education, this thesis aims to define spaces and organize activities that foster the six categories of indigenous learning outlined by Gregory Cajete <sup>24</sup> :

- Experiential Learning/Place-based Education
- Storytelling
- Master/Apprentice
- Creative Dreaming
- Ritual/Ceremony
- Artistic Creation

### **3.4.1 Experiential Learning and the Value of Place-Based Education**

For Cajete and Little Bear, participation with nature through activities such as hunting, fishing and gathering reinforces an innate “biophilia” essential in early childhood development.<sup>25</sup> “... [T]raditional education processes were carefully constructed around observing natural processes, adapting modes of survival, obtaining sustenance from the plant and animal world, and using natural materials to make their tools and implements. All of this was made understandable through demonstration and observation accompanied by thoughtful stories in which the lessons were embedded.”<sup>26</sup> In this way we see how experiential

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<sup>24</sup> Cajete, *Igniting the Sparkle*, 53-72.

<sup>25</sup> Cajete and Little Bear, *Native Science*, 98-104.

<sup>26</sup> Barnhardt, *Indigenous knowledge systems*, 10.

learning was inextricably woven into everyday life. Tim Ingold reinforces a participatory approach to learning when he states, “For the Ojibwa, however, knowledge does not lie in the accumulation of mental content. It is not by representing it in the mind that they get to know the world, but rather by moving around in their environment, whether in dreams or waking life, by watching, listening and feeling, actively seeking out the signs by which it is revealed. Experience, here, amounts to a kind of sensory participation, a coupling of the movement of one’s own awareness to the movement of aspects of the world.”<sup>27</sup> In summation, this vessel aims to provide experiential learning to students who do not have the same opportunities to learn from everyday subsistence strategies or participate in nature in the same ways as in the past.

Additionally, the major role that seasons play in the livelihoods of the people of the Great Lakes suggests a curriculum reflective of them. Danziger describes how fluctuating populations and portable homes were characteristic of Northern Great Lakes villages that relied on mobile subsistence strategies across land and water where families scattered in search of wild game during the winter months and came together again for fish runs and syrup harvests in the spring.<sup>28</sup> As a means of once again taking advantage of seasonal changes that affect the natural environment, the curriculum includes many seasonal-based activities such as the spring sap harvest, summer medicinal plant harvest, fall hunt and winter snowshoeing. The curriculum is expected to evolve over time according to

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<sup>27</sup> Tim Ingold, *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill* (London: Routledge, 2000), 99.

<sup>28</sup> Danziger, *Great Lakes Indian Accommodation*, 3.

community knowledge, collaboration, values and interests.

### **3.4.2 Storytelling**

Storytelling helps to develop understanding through creative synthesis and foster new relationships between Elders and youth. In the absence of a formal language class, this space serves to practice Ojibwa language as well.

The ability to tell and listen to stories develops a whole range of verbal and non-verbal skills, as well as what we call right and left-brain functions, in both the storyteller and listener. This is an especially significant characteristic for teaching and learning by children. Telling or listening to stories is an almost universal activity of younger children, but it is a capacity that is rarely capitalized upon, guided, or developed toward positive learning. It is one of those subtle human activities that needs only to be exercised and valued.<sup>29</sup>

This type of learning is fostered through a curriculum that includes many indigenous educators, guest speakers, and community Elders.

### **3.4.3 Master/Apprentice**

As mentioned previously, the dominant Master/Apprentice learning type in the Western school system serves as the overlapping component between the proposed Anishinaabe education system and the Western school system. In the instance of this project, the hierarchy is maintained but the spatial arrangement of the pupils is radially altered around the teacher thereby removing the distance between student and teacher which encourages more conversational lessons.

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<sup>29</sup> Cajete, *Igniting the Sparkle*, 57.

### 3.4.4 Creative Dreaming

Cajete describes dreaming as a means of learning about oneself in an intimate way and argues that they can be actively used to help ourselves in the everyday waking life.<sup>30</sup> Using personal reflection as the basis for learning, the Creative Dreaming vessel focuses on both new and old practices of achieving mindfulness and wellbeing. This is facilitated in the design through the provision of spaces for dreaming, meditation and discussion.

Both Western and Ojibwa people might agree that in a certain sense, dreaming liberates the mind from its bodily housing. But whereas in the Western conception, this amounts to a taking leave of reality, for the Ojibwa it allows complete freedom of movement *within* the earthly and cosmic space of ordinary life.<sup>31</sup>

### 3.4.5 Ritual/Ceremony

Cajete describes ritual and ceremony as a means of “finding life” through the full realization of mythical self.<sup>32</sup> Similar to the storytelling vessel, this vessel includes a largely unobstructed gathering space that can facilitate this phenomenon with storage space for regalia and instruments.

Through the symbolic use of prayer, song, dance and communal activity, Native Americans developed highly creative techniques for guiding social behavior and ethics. The social psychology inherent in ritual and ceremony provided powerful group empathy and cohesion which reinforced the social self-image of each individual participant.<sup>33</sup>

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30 Cajete, *Igniting the Sparkle*, 58-59.

31 Ingold, *The Perception of the Environment*, 101.

32 Cajete, *Igniting the Sparkle*, 59-60.

33 *Ibid.*, 59.

### 3.4.6 Artistic Creation

Cajete describes artistic creation as the key mediator in learning and teaching science, that, in fact, art is a representation, science an explanation. Science is inherently a creative process and can be taught through art.<sup>34</sup>

A parallel in Western thought is the artist, as artists also do this kind of meandering. The value of the effort, the coming to know, is found in the journey, in addition to or rather than, the end result. Consequently, this is why Western artistic traditions find greater affinity with Indigenous thinking than does the scientific mind-set. There is a kind of natural connection between these processes, an intersection.<sup>35</sup>

As a mediator for learning and teaching science, the artistic creation vessel is equipped with plenty of tools for indigenous crafts and the curriculum includes many outdoor excursions similar to those of the experiential learning vessel.

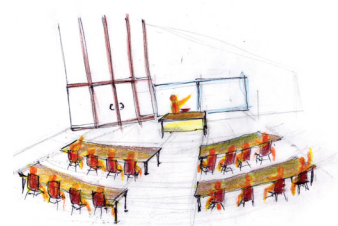
For the purpose of flexibility, large unobstructed spaces are featured in each vessel. This allows them to be altered for different learning types and activities while retaining the common circular spatial arrangement found in many areas of Anishinaabe culture outlined in section 3.5.



Storytelling



Creative Dreaming



Master/Apprentice



Experiential Learning



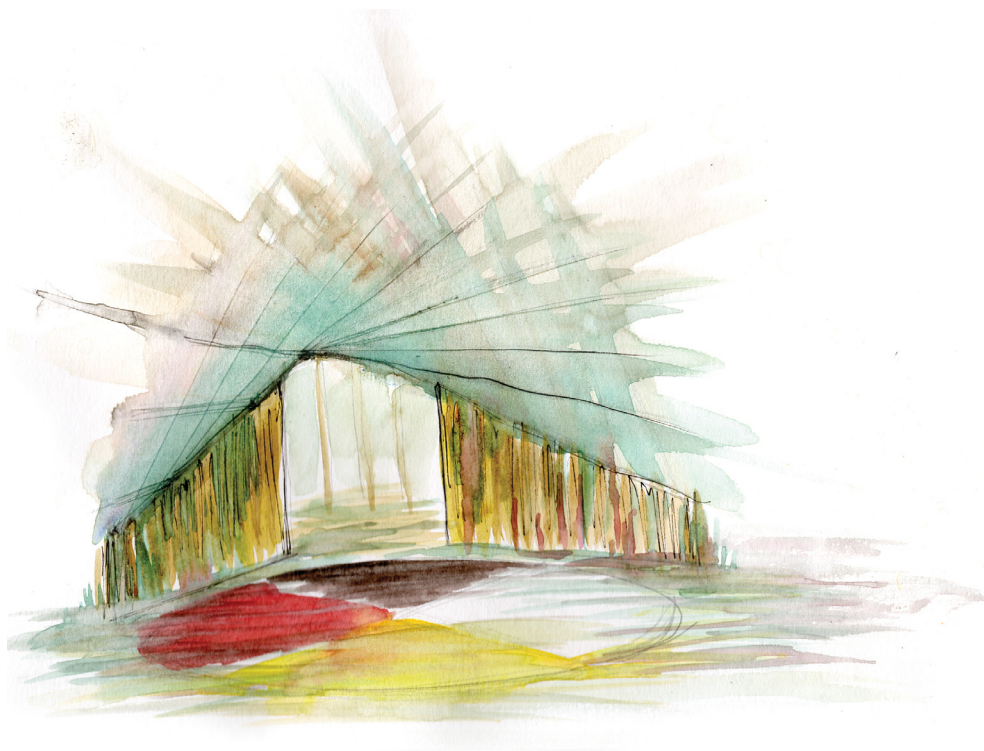
Experiential Learning

Coloured pencil sketches. Showing various spatial arrangements based on furnishings and equipment.

<sup>34</sup> Ibid., 61-72.

<sup>35</sup> Cajete and Little Bear, *Native Science*, 81.

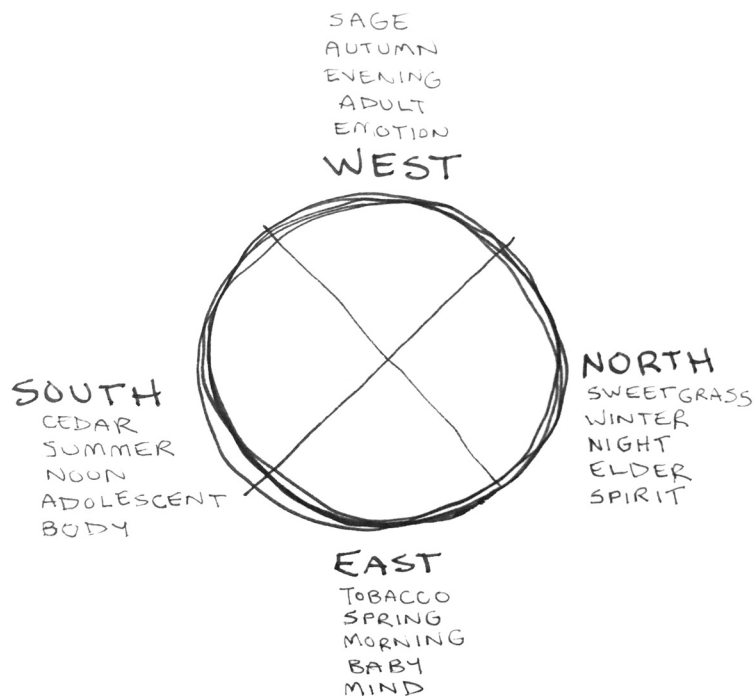




Watercolours. (top) Creating an adaptable space for an adaptable curriculum (bottom) Concept for Artistic Creation Vessel.

### 3.5 Defining Spatial Organization: The Circle

The life of a man is a **circle** from childhood to childhood, and so it is in everything where power moves. Our teepees were round like the nests of birds, and these were always set in a circle, the nation's hoop, a nest of many nests, where the Great Spirit meant for us to hatch our children. But the Wasichus [white man] have put us in these square boxes. Our power is gone and we are dying, for the power is not in us anymore.<sup>36</sup>



Sketch. Medicine wheel pedagogy illustrating Eastward orientation, interconnectedness of all things, and cyclical processes such as the seasons and times of day.

#### **The Medicine Wheel**

Sharilyn Calliou describes the medicine wheel as “...a pedagogical device designed to assist contemplation of the continuity and interconnectedness of events and

<sup>36</sup> Black Elk, John G. Neihardt, and Vine Deloria, *Black Elk Speaks: Being the Life Story of a Holy Man of the Oglala Sioux* (Lincoln: University of Nebraska Press, 1988), 121-122.

conditions of all beings.”<sup>37</sup> Throughout my travels along the Great Lakes shoreline, evidence of the medicine wheel pedagogy is found in every community and is manifested physically in the form and orientation of both Pow Wow grounds and traditional forms such as the conical wigwam and sweatlodge structures.

### ***The Pow Wow Grounds***

The Pow Wow is a means of connecting with other communities and celebrating culture. The grounds illustrate the Four Sacred Directions and the importance of the Eastern Doorway as denoted, in part, by the Medicine Wheel. “The east is, through its association with the sunrise, a place of beginnings and enlightenment, and a place where new knowledge can be created or received to bring about harmony or right relations.”<sup>38</sup> Movement within the Pow Wow circle is a literal translation of cyclical time where Anishinaabe dancers must always travel in a clockwise direction and always, always move forward.

### ***The Talking/Healing circle***

The Talking/Healing Circle practices both listening and speaking skills. Participants sit in a circle and a talking stick (or eagle feather or other sacred object) is passed clockwise around the circle. Only the bearer of it may speak, all others in the circle must remain silent.

As a speaker, students build confidence and self-esteem and, as listeners, students develop deeper listening

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37 Sharilyn Calliou, “Peacekeeping Actions at Home: A Medicine Wheel Model for a Peacekeeping Pedagogy,” in *First Nations Education in Canada: The Circle Unfolds*, ed. Marie Battiste and Jean Barman (University of Washington Press, 1995), 52.

38 Ibid., 67



and reflecting skills. Often we lose focus of what others are saying because we focus on what to say in response. The talking circle prevents this type of directly responsive communication and grants each person an equal opportunity to present their opinion.<sup>39</sup> As a daily exercise, the talking circle sets the stage for the remainder of the day and the curriculum becomes centred on the students' personal realities and interests - the bottom-up approach to education as described in section 3.6.

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39 Robert Regnier, "The Sacred Circle: An Aboriginal Approach to Healing Education at an Urban High School," in *First Nations Education in Canada: The Circle Unfolds*, ed. Marie Battiste and Jean Barman (University of Washington Press, 1995), 325.



Watercolour. Medicine Wheel.



Watercolour. Pow Wow Grounds.



Watercolour. The Talking Circle.

### 3.6 Defining Audience: Towards Total Community Engagement

The chosen audience for this vessel-based education system includes Anishinaabe educators, Elders and children grades 5-12 (age 10-17). Not only are youth more impressionable but they are also valued most in the community. Residential schooling is a prime example of just how powerful, but also destructive, childhood education can be. As in various other First Nation education projects across Canada, parents and community members are most agreeable to a new system if their children are getting a learning experience they are excited about. A bottom-up approach to learning similar to that of the *Green School* in Bali, India ensures that children learn more about what they want and apply it to everyday situations as opposed to the Western school system which encourages children to focus on global issues and specialise towards their interests after high school graduation.

Developmental psychologist Peter Gray argues that the age segregation of children in schools deprives them of some of the most valuable interactions for learning.<sup>40</sup> There is a lot to learn from age-mixing and, as someone who grew up in a close-knit, age-mixed school, I can attest to the benefits of interacting with both older and younger classmates as well as teachers. As followers, younger children learn to listen and emulate the actions of older children and, as leaders, older children learn to lead, nurture and take responsibility of younger ones.

Human behaviour is always modelled upon  
that of forebears with whom we have had direct

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40 Peter Gray, "The Special Value of Children's Age-Mixed Play"  
Vol. 3 of *American Journal of Play* 4 (Spring 2011), 500-522.

contact and interaction. In this way, we learn not simply through reading abstract symbols that convey information, but primarily through almost unconscious mimicry of those around us during our formative years. Disruptions in an intergenerational chain of learning caused by separation, neglect, or lack of interest reverberate through subsequent generations.<sup>41</sup>

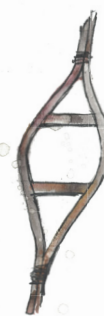
Here, the ripple effect described by Eades stresses an urgency to preserve intergenerational learning. Looking forward to the future, I believe the restoration of traditional teaching styles as well as free age-mixing can reverse the damage to this intergenerational chain without compromising the ability for children to “succeed” in contemporary society. Rather, this new vessel-based education system will empower individuals to take control of their future at an earlier age.

### 3.7 Defining Material Strategy: Thinking Through Making

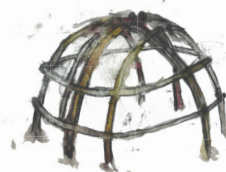
The material strategy for this thesis is based primarily on Tim Ingold’s morphogenic approach which presents the idea of “thinking through making”. The focus here is not so much on a final product (and indeed there is never a final product) but on the process of making and entering into a relationship with the world.<sup>42</sup> Through engagement with materials one gains a better understanding of how things are made, how form is generated through movement, the dynamic properties of the materials used and an overall sense of the natural processes in the environment that produce these materials. Cajete makes a similar case for

41 Gwilym Lucas Eades, *Maps and Memes : Redrawing Culture, Place, and Identity in Indigenous Communities* (Montreal and Kingston: McGill-Queen’s University Press, 2015), 181.

42 Tim Ingold, “The Materials of Life,” in *Making: Anthropology, Archaeology, Art and Architecture* (London: Routledge, 2013), 17-26.



Ojibwa snowshoe frame



Wigwam frame



3-pole tipi



Basic survival shelter



Bentwood truss arch (design by Richard Kroeker)

Watercolours. Bentwood/  
Roundwood assemblies.

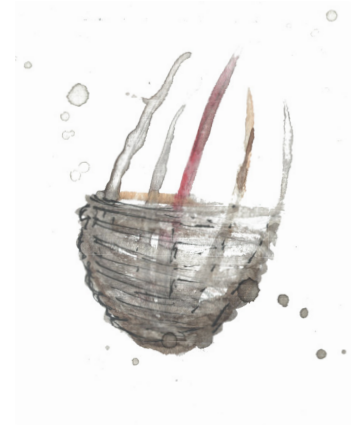




Student design charette on basket-weaving, September 2016. (Left) Kotaro Kato (right) Shu-Yu Lin.

this strategy in describing the process of building structures as equally or more important than the structures themselves because the process of making reinforces lessons of cooperation and responsibility as well as the role members of the community would play in construction.<sup>43</sup>

The importance of this participatory design process as a means of understanding materials has been made evident in my basket-weaving design charette and has continued to emerge as a guiding principle throughout the development of this thesis. The sketchmodels below were used as a means of exploring different spaces and atmospheres that could be created using the knowledge gained from the previous basket-weaving charette.



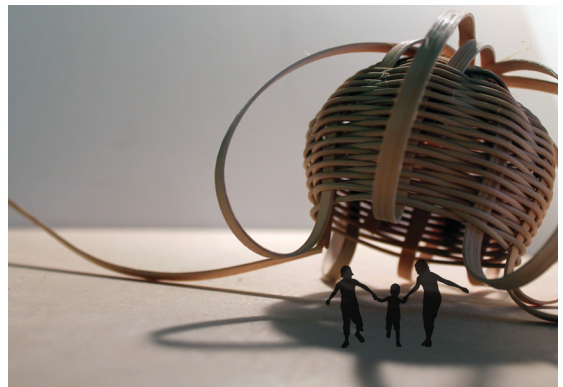
Watercolour. The art of basket-weaving.



Results of basket-weaving design charette.

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43 Cajete and Little Bear, *Native Science*, 100-101.



Sketch models. Form finding through weaving.



### 3.8 Redefining Form: Climate Determinism and Architecture

Gregory Cajete's description of climate-specific water vessels throughout the Americas provides physical evidence of the influence the surrounding environment has on material culture. The primary vessel of choice for the people of the northeastern woodlands (which encompasses the Great Lakes) was the birch bark canoe because it served well for numerous portages between lakes and rivers. The fragility of these vessels that were prone to puncture damage was outweighed by their portability and their simple repairability given the abundance of birch trees. Cajete also points out that the trade network supported by these vessels was invaluable to the early European fur traders and explorers.<sup>44</sup> The networks created by these vessels as well as the knowledge required to build them from locally-sourced materials stands testament to the value of occupying the same environment for long periods of time and the act of returning to the water as mentioned previously. As Richard Kroeker says,

The *Algonquin canoe* was built according to a process dictated by material and use. Complex principles of structure and dynamic were revealed in its making. *The Eskasoni lodges*, which were built using materials from the site, had an even stronger literal identity with the site. The role of designer was as the active agent, following instructions inherent in material, site and use. Our readings of these were helped by centuries of tradition and evolution.<sup>45</sup>

Clearly climate is not an exclusive form determinant of Native American architecture. Amos Rapoport says,

<sup>44</sup> Cajete and Little Bear, *Native Science*, 201-204.

<sup>45</sup> Richard Kroeker, foreword to *Beaverbank: Between Material and Process*, by Frank Chiu (Halifax, N.S.: TUNS Press, 1995), 5.



*Algonquin Canoe*. Images courtesy of Richard Kroeker.



*Eskasoni lodges*. Images courtesy of Richard Kroeker.

“Materials, construction, and technology are best treated as modifying factors, rather than form determinants, because they decide neither what is to be built nor its form-- this is decided on other grounds.”<sup>46</sup> For instance, social factors might determine building size and structural elements might be determined by religious belief. Frei Otto, a master of lightweight structures from the early 60s and 70s, calls this approach “form finding” as opposed to “form making”.

### 3.9 Defining Construction Strategy: Towards Self-Sufficient Economies

Construction of the mobile vessels combines traditional material knowledge and skills with innovative technology to promote local culture and ultimately, to empower individuals with transferable skills that will allow them to grow the local economy.

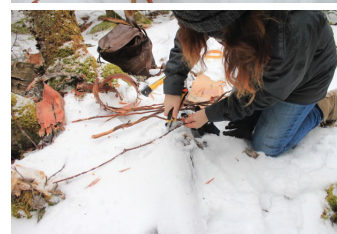
Imported industrial materials will only be used if the advantages far outweigh those of natural materials. The technology necessary to use these materials must also be teachable and must not rely on external contractors for installation or maintenance. Whenever possible, non-local materials will be salvaged. This is represented through the use of hospital surplus plastic hydrogen peroxide barrels in the floating base of each vessel.

Naturally occurring boron salts will be used to fireproof the proposed sphagnum moss insulation (shown below) and calcium stearate (common non-toxic food preservative) will be used for waterproofing.

<sup>46</sup> Amos Rapoport. *House form and culture*. (Englewood Cliffs, NJ: Prentice-Hall, 1991), 25.



*Tiny house*. Deanery project freelab 2014. “Bagging” insulating materials within the floor joist cavities to reduce floor thickness.



Material harvest in rural Nova Scotia..





Birch bark basket sewn with split spruce root.



Braided cattail leaves.



Split spruce root.



Birchbark.



Cattail stalks.



Experiments in natural insulating materials. From left to right: Usnea (old man's beard), cattail (bulrush), and sphagnum moss.



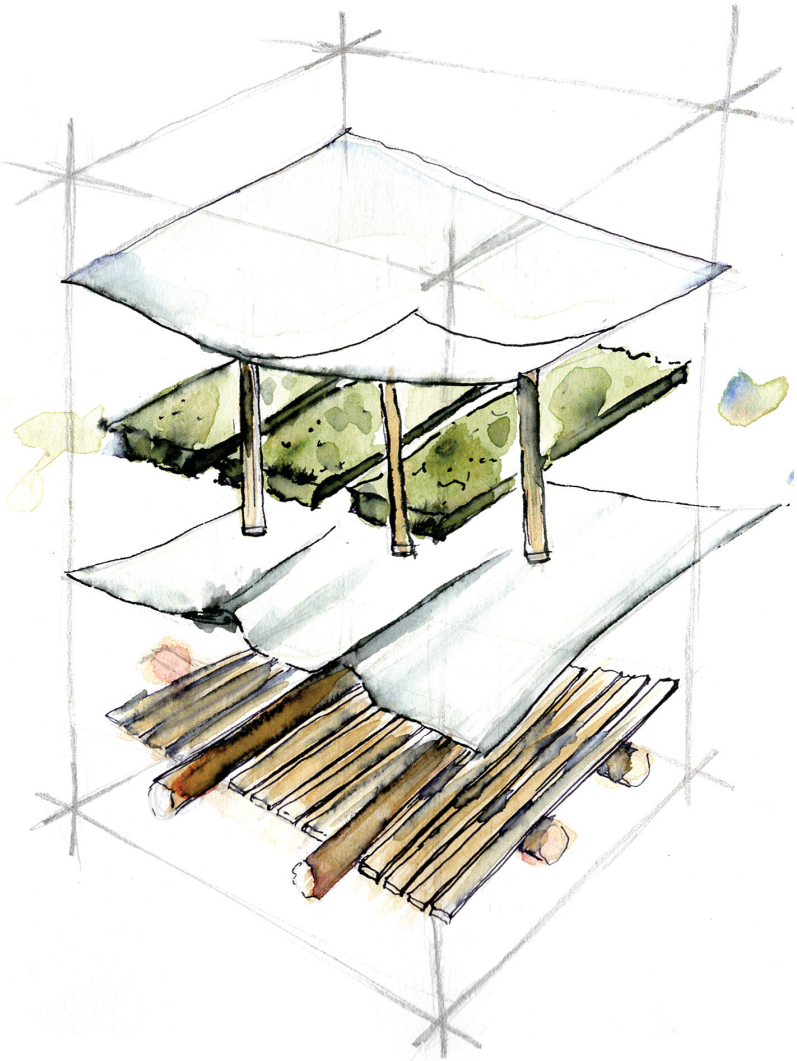


Experimenting with sphagnum moss as an alternative to rigid insulation. From top to bottom: (1) lightly compressed (2) pulped and compressed (3) pulped w/ shredded paperboard and compressed (4) pulped w/ calcium stearate and compressed (5) pulped, compressed, dried and dipped in calcium stearate.



### ROOF ASSEMBLY (exterior to interior)

- waterproof solar cell fabric for weather protection and electricity generation
- 1 x 3 wood battens @ 16" o.c. for ventilation
- topmost structural layer @ approx. 2' o.c. , 3 layers 2 inch sphagnum moss insulation friction fit and tapered to be flush with topmost structural layer of roundwood logs (OR 3 layers 2 inch rigid insulation), vapour barrier for "bagging" insulation material between structural layers, parallel 1 x 3 strapping between structural members screwed to innermost structural layer
- innermost structural layer @ approx. 2' o.c. exposed, earth plaster on 1 x 3 strapping (optional)



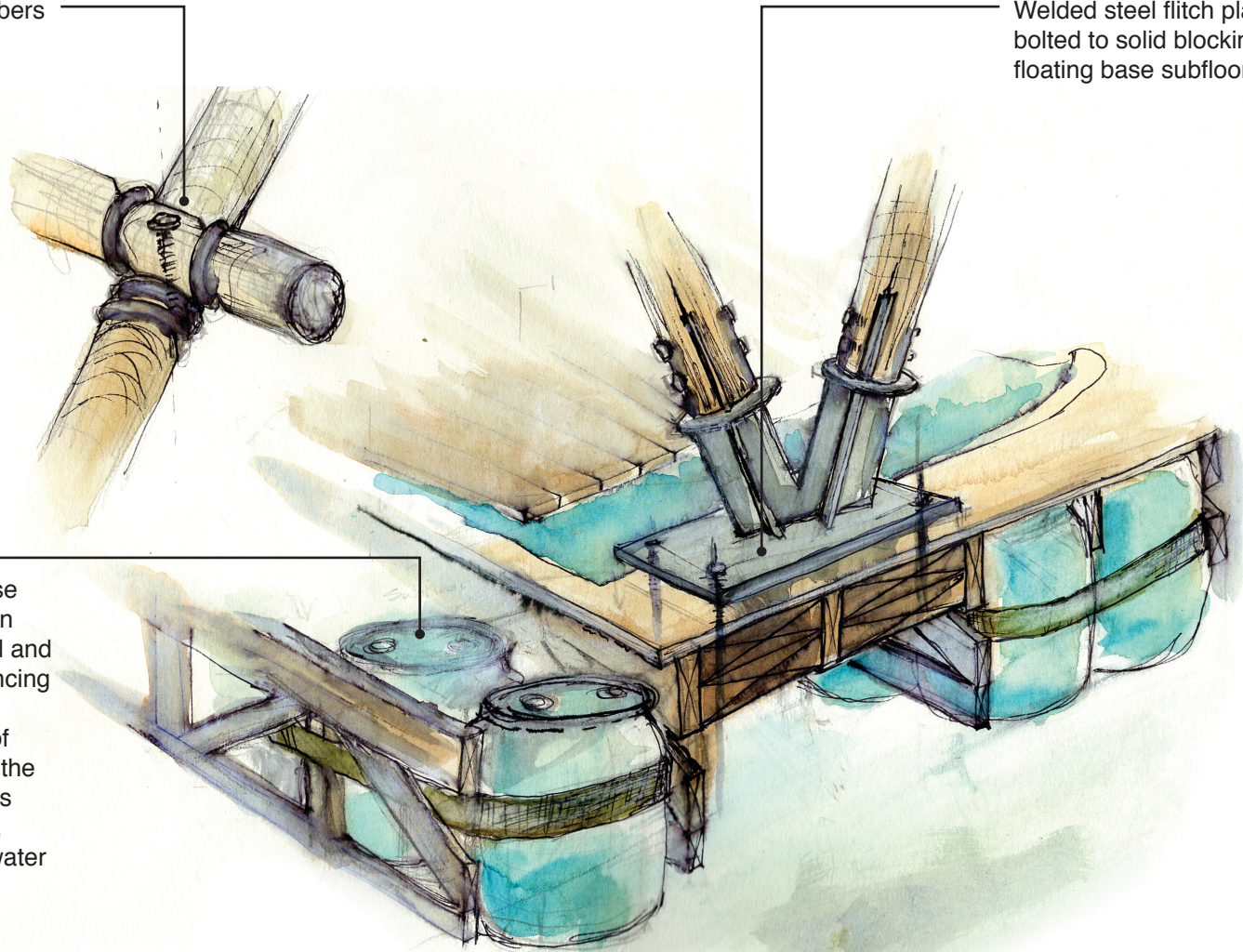
Watercolours. Proposed roof assembly section and exploded axonometric.



Perpendicular roof members notched for lashing. Alternative option for pin connectors.

Welded steel fitch plates bolted to solid blocking below floating base subfloor.

Salvaged blue barrels strapped to adjacent base frame. Vertical orientation allows barrels to be filled and emptied during the balancing process of the floating base. Additional option of cutting sections through the floor to use the barrels as containers for local flora, waste composting, rainwater collection, etc.

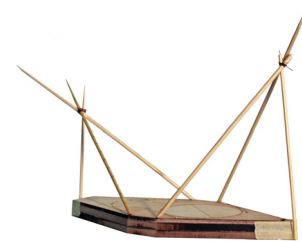


Watercolours. Proposed lashing of structural roof members and proposed connection of roof to blue barrel floating base.

It is only when we come to represent local differences in terms of a globalising discourse that the centre from which each perspective is taken is converted into a boundary within which every local view is seen to be contained. The idea that the 'little community' remains confined within its limited horizons from which 'we' – globally conscious Westerners – have escaped results from a privileging of the global ontology of detachment over the local ontology of engagement. To the extent that it has been used to legitimate the disempowerment of local people in the management of their environments, this idea has had serious practical consequences for those amongst whom anthropologists have conducted their studies. To adopt a distinction from Niklas Luhmann (1979), it might be argued that the dominance of the global perspective marks the triumph of technology over cosmology. Traditional cosmology places the person at the centre of an ordered universe of meaningful relations, such as that depicted by Maffei (Figure 12.2), and enjoins an understanding of these relations as a foundation for proper conduct towards the environment. Modern technology, by contrast, places human society and its interests outside what is residually construed as the 'physical world', and furnishes the means for the former's control over the latter. Cosmology provides the guiding principles for human action *within* the world, technology provides the principles for human action *upon* it.<sup>47</sup>



1. Construct blue barrel floating base.



2. Prop up and mark spacing along the edge roof members.



3. Lash roof members to coinciding numbers.



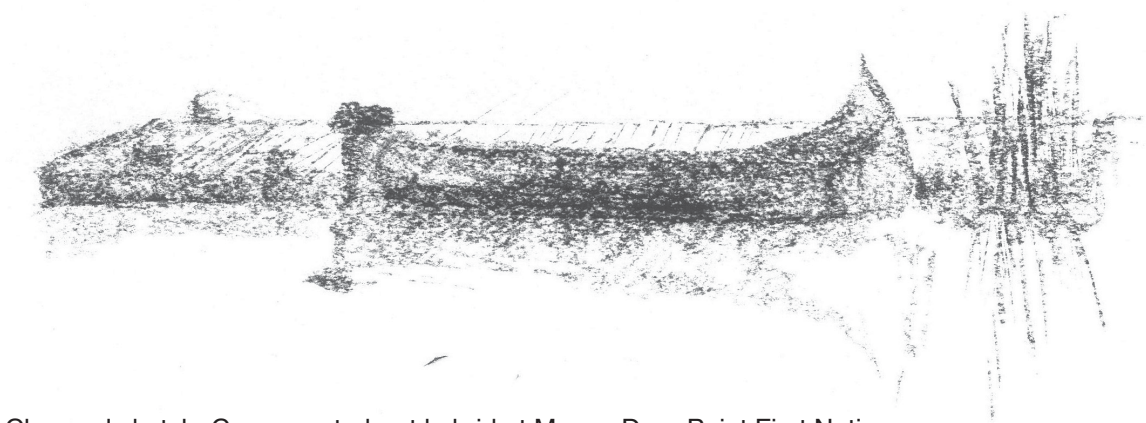
4. Remove guides, lash remaining roof members while making sure to line-up vertical mullions below.



5. Continue lashing roof members and adding mullions until complete.

5-step Construction Process

<sup>47</sup> Ingold, *The Perception of the Environment*, 216.



Charcoal sketch. Canoe motorboat hybrid at Moose Deer Point First Nation.



Watercolours. Methods of bending larger wood members.

The architectural design takes a critical approach to wood production processes and current forces of consumption. Though new certification programs, such as local FSC certification, are aimed towards providing sustainably-sourced wood, the process of acquiring certification for smaller and more localized forestry operations makes it inherently unsustainable.<sup>48</sup> The use of trees in-the-round reinforces the practice of local procurement and moves the conversation of sustainability past the commercialised points of harvest and fabrication.

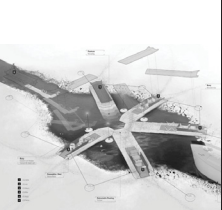









### 3.10 Defining Precedents: Cross-cultural Case Studies

<sup>48</sup> Kroeker, Richard and Ted Cavanagh. "Revaluing Wood." in *Sustainable Architectures*. New York: Spon Press, 2005: 123-143.





The art of wood bending. Images courtesy of Richard Kroeker.



Project No. & Title	Image	Curriculum + Architectural Characteristics	Application	Application diagram
1. <i>Liquid Commons</i> by Lateral Office Hudson Strait, NU/ QC, Canada		<ul style="list-style-type: none"> <li>nomadic spring/summer/fall</li> <li>sedentary winter gathering</li> <li>specialized boats for different program activities (art, film, verbal, skills, book, music)</li> </ul>	<ul style="list-style-type: none"> <li>nomadic spring/summer/fall</li> <li>sedentary winter gathering</li> <li>specialization by program activity</li> </ul>	
2. <i>Jean Marie Tjibaou Cultural Centre</i> by Renzo Piano New Caledonia, New Zealand		<ul style="list-style-type: none"> <li>adaptation of traditional Kanak hut designs</li> <li>specialized huts for different activities (classroom, media center, theater)</li> <li>empowerment through strengthening cultural identity</li> <li>approx.. 3000 sq ft classroom for 20 children</li> <li>natural ventilation system</li> </ul>	<ul style="list-style-type: none"> <li>specialization by program activity</li> <li>adaptation of traditional Native American architecture</li> <li>similar classroom capacity and size</li> <li>take advantage of natural processes for heating/ventilation/water purification</li> <li>focusing on empowerment through strengthening cultural identity</li> </ul>	
3. <i>Great Lakes Cultural Camps</i> , Northern Ontario, Canada		<ul style="list-style-type: none"> <li>mobile outreach program focused exclusively on experiential learning in the surrounding natural landscape of Northern Ontario</li> <li>programs revolve around traditional and seasonal activities</li> <li>programs based on active participation of individuals</li> </ul>	<ul style="list-style-type: none"> <li>similar experiential learning strategies and tools</li> <li>using mobility as a means of bringing education to remote communities</li> <li>utilizing surrounding natural landscape as a tool for learning</li> </ul>	
4. <i>Greenschool</i> by PT Bambu Bali, Indonesia		<ul style="list-style-type: none"> <li>“not filling a bucket, but rather lighting a fire”</li> <li>focus on child-centered learning (bottom-up approach)</li> <li>utilizes local bamboo for architecture</li> <li>uses renewable energy and natural ventilation</li> <li>heavy focus on learning from natural environment and creating community</li> </ul>	<ul style="list-style-type: none"> <li>similar bottom-up approach to learning</li> <li>similar curriculum strategy focused on natural processes and fostering a sense of togetherness with community (place-based education)</li> </ul>	
5. <i>Pictou Landing Health Centre</i> designed by Richard Kroeker and Brian Lilley in collaboration with Peter Henry architects		<ul style="list-style-type: none"> <li>constructed by members of the community using local trees in-the-round.</li> <li>adaptation of traditional Native American architecture</li> <li>empowerment through strengthening cultural identity</li> <li>heating and cooling through geothermal energy</li> </ul>	<ul style="list-style-type: none"> <li>design with local materials and an intent to create local skilled labourers in the construction of the project</li> <li>adaptation of traditional Native American architecture</li> <li>empowerment through strengthening cultural identity</li> </ul>	

Case Studies Chart.

Project No. & Title	Image	Curriculum + Architectural Characteristics	Application	Application diagram
6. <i>Makoko Floating School</i> , Lagos, Nigeria		<ul style="list-style-type: none"> <li>vertical blue barrel floating base</li> <li>barrels at the periphery can be used to store excess rainwater from the catchment system</li> <li>use of local skills and materials</li> </ul>	<ul style="list-style-type: none"> <li>vertical blue barrel floating base</li> <li>barrels at the periphery will be used to store excess rainwater</li> <li>spaces within the base frame can also be used to hold tanks for greywater and blackwater treatment or even a small terrarium of plants</li> </ul>	
7. <i>De Spil Extended School</i> , Arnhem, Netherlands		<ul style="list-style-type: none"> <li>larger shared communal space creates a feeling of togetherness found in larger schools</li> <li>each community has their own space within the school</li> </ul>	<ul style="list-style-type: none"> <li>larger shared communal space</li> <li>each community has their own space within the school</li> </ul>	
8. <i>Yellowknife floating homes</i> , Yellowknife, NWT		<ul style="list-style-type: none"> <li>blue barrel floating bases designed to hold up during the freeze/thaw cycle</li> <li>the base takes advantage of salvaged materials</li> </ul>	<ul style="list-style-type: none"> <li>similar floating base</li> <li>take advantage of salvaged materials</li> </ul>	
9. <i>La capilla de Palmira</i> by Felix Candela, Las Lomas de Cuernavaca, Morelos, México		<ul style="list-style-type: none"> <li>creating curves using straight members</li> <li>increased skilled labour, decreased material usage</li> </ul>	<ul style="list-style-type: none"> <li>creating curves using straight members</li> <li>increased skilled labour, decreased material usage to foster local economy</li> </ul>	
10. <i>Hooke Park Assembly Workshop</i> by AA Design & Make, Beaminster, Dorset, England		<ul style="list-style-type: none"> <li>larch wood, is sourced from Hooke Park and local woodlands</li> <li>tree-trunks used "in-the-round", thereby retaining their full structural integrity.</li> <li>maximises the use of local resources and minimises reliance on industrial production of building components.</li> <li>2D and 3D flitch plates used as connectors</li> </ul>	<ul style="list-style-type: none"> <li>3D flitch plate connectors used to fasten roof to the floating base</li> <li>maximise local resources and minimise reliance on industrial production of building components</li> <li>use in-the-round tree trunks from Georgian Bay forests for the main hyper structure</li> </ul>	

Project No. & Title	Image	Curriculum + Architectural Characteristics	Application	Application diagram
11. <i>Modroof</i> , Ahmedabad, Gujarat, India		<ul style="list-style-type: none"> <li>use hydrophobic agents to waterproof cardboard for use as an inexpensive roofing material</li> </ul>	<ul style="list-style-type: none"> <li>use a hydrophobic agent (calcium stearate) to waterproof sphagnum moss insulation</li> </ul>	

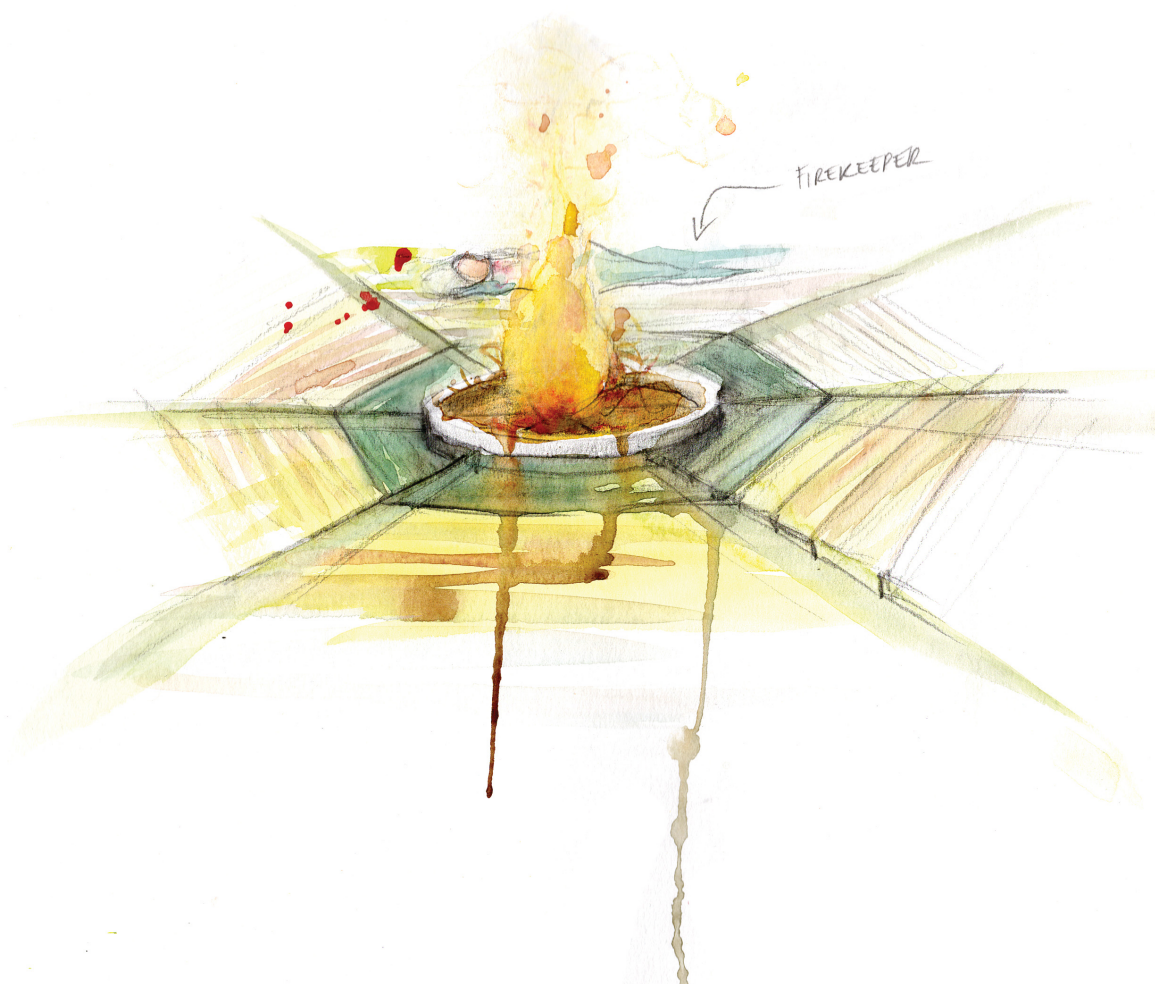
#### Image sources

1. Lateral Office. Axonometric showing Liquid Commons Units mooring along the Hudson Strait icebreaker route. Accessed March 30, 2017. <http://lateraloffice.com/LIQUID-COMMONS-UNIT-2010>.
2. Renzo Piano Building Workshop. Jean-Marie Tjibaou Cultural Centre Floor Plan. Accessed March 29, 2017. <http://www.archdaily.com/600641/ad-classics-centre-culturel-jean-marie-tjibaou-renzo-piano>.
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4. PT Bambu. Bamboo Structure. Accessed March 29, 2017. <http://www.archdaily.com/81585/the-green-school-pt-bambu/5012b13328ba0d147d00048b-the-green-school-pt-bambu-photo>.
5. Image courtesy of Richard Kroeker.
6. NLE Architects. Floating base construction. Accessed March 29, 2017. <http://www.archdaily.com/344047/makoko-floating-school-nle-architects>.
7. Image sourced from *Space and Learning* by Herman Hertzberger.
8. Image courtesy of Kim Fuller, Yellowknife floating house owner.
9. ADN Morelos. Temporary formwork. Accessed March 29, 2017. <http://www.adnmorelos.com/2015/07/31/mas-de-sesenta-anos-de-palmira/>.
10. AA Design + Make. Hooke Park Big Shed. Access March 30, 2017. <http://designandmake.aaschool.ac.uk/hooke-park-big-shed/>.
11. ReMaterials. Modroof. Accessed March 29, 2017. <http://re-materials.com/modroof/>.





Watercolour. Proposed lashing connection between six hyper roof structures and smoke flap detail for central fireplace below.



Watercolour. Proposed steel ring embedded within the bows of six vessel bases. Additional steel plate flooring surrounding the central fireplace for fireproofing.

CREATIVE DREAMING

1. lounge space w/ flexible hanging fabric alcoves
2. book/laptop storage
3. washroom
4. solarium
5. exterior deck
6. emergency raft
7. boarding ladder

MASTER/APPRENTICE

1. workspace/seating area
2. book/laptop storage
3. washroom
4. solarium
5. exterior deck
6. emergency raft
7. boarding ladder

EXPERIENTIAL LEARNING

1. workspace/seating area
2. outdoor equipment storage
3. washroom
4. solarium
5. exterior deck + kayak launch ramp
6. emergency raft
7. boarding ladder

ARTISTIC CREATION

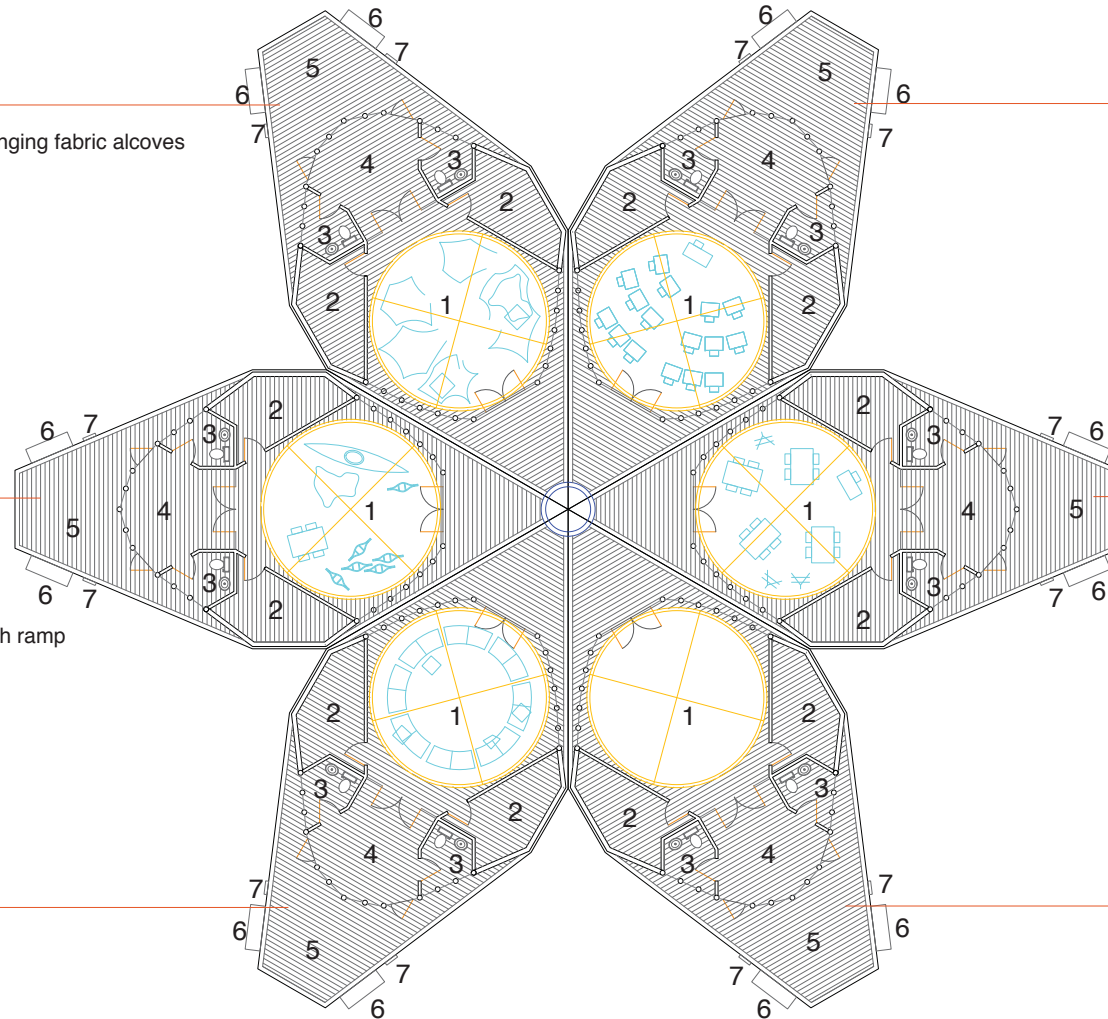
1. workspace/seating area
2. material + equipment storage
3. washroom
4. solarium
5. exterior deck
6. emergency raft
7. boarding ladder

STORYTELLING

1. gathering space
2. book storage
3. washroom
4. solarium
5. exterior deck
6. emergency raft
7. boarding ladder

RITUAL/CEREMONY

1. gathering space
2. book storage
3. washroom
4. solarium
5. exterior deck
6. emergency raft
7. boarding ladder

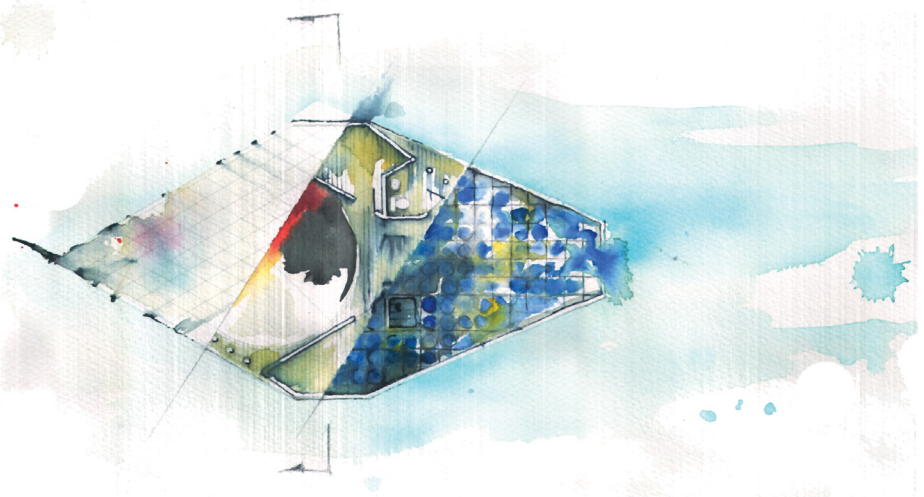


Floor Plan 3/64" = 1'-0"





Cross Section 3/64" = 1'-0"



Base/Main Floor/Roof Plan 3/64" = 1'-0"



Longitudinal Section 3/64" = 1'-0"





Photomontage. Using the natural landscape as a teaching resource.





Photomontage. Reconnecting to the water through occupation of the Lakes.





Photomontage. Playing on the ice near the Winter Pow Wow gathering.



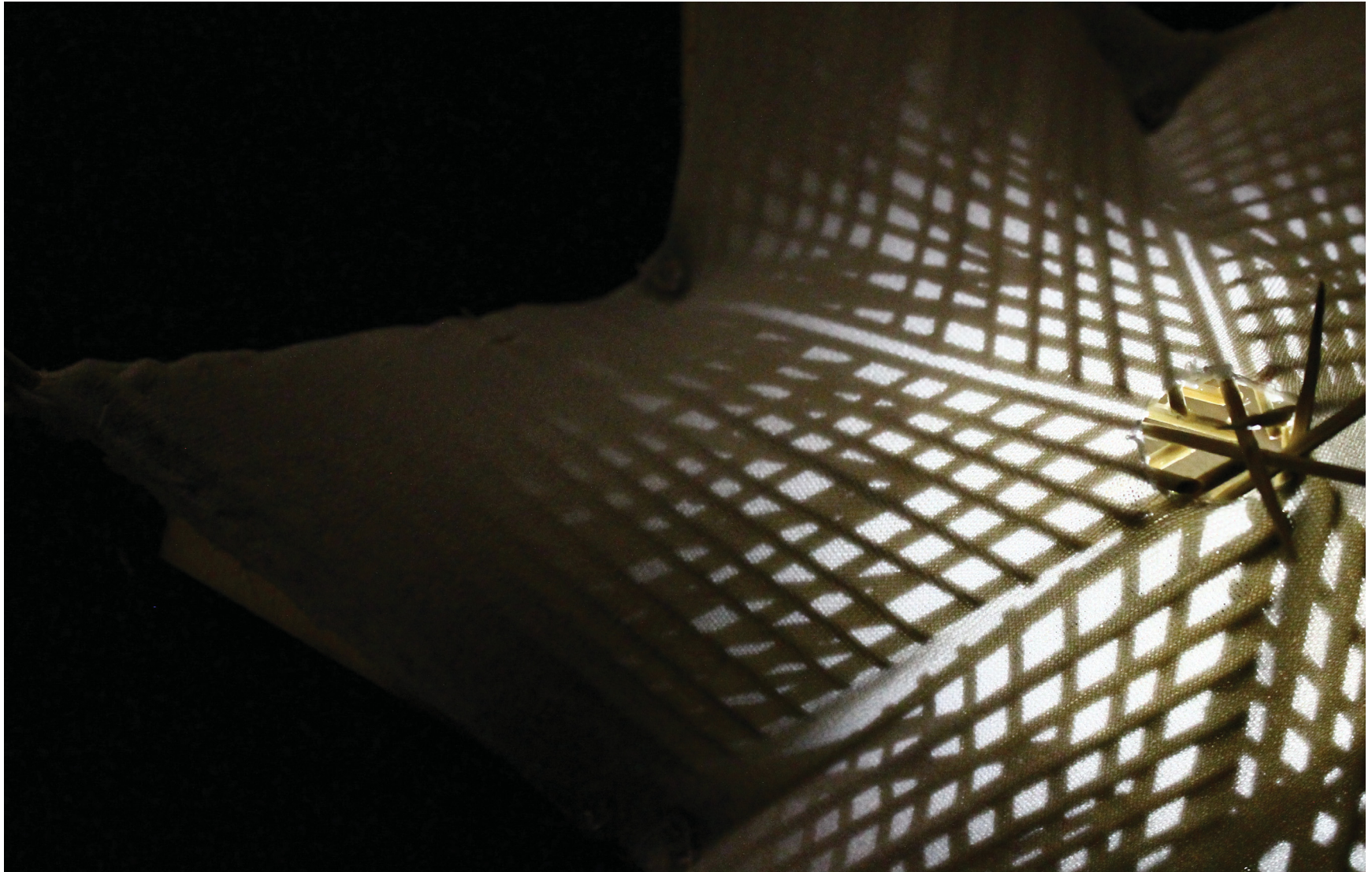
Photomontage. Winter Pow Wow gathering under the stars.





Photomontage. Central gathering space created by the assembly of six vessels.





3D physical model.





3D physical model. Embedded fireplace ring connection.



## CHAPTER 4: CONCLUSION

This project celebrates Anishinaabe culture and our interdependence on the surrounding natural environment through a vessel-based education system equipped for the exploration of the natural shorelines of the Georgian Bay while its construction fosters self-sufficient economies necessary for supporting long-term residency along these shorelines. The end goal is the eventual infiltration and coloring of the existing Western education systems in Canada to include pedagogies more reflective of the country's diverse peoples.



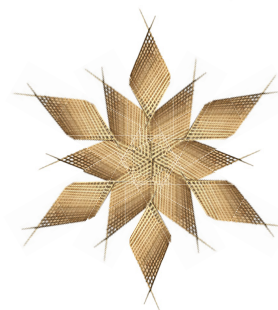
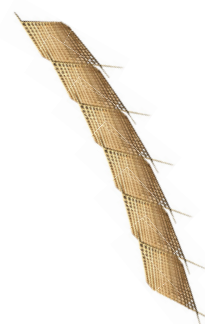
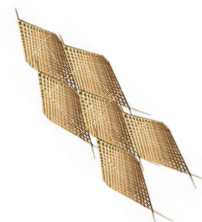
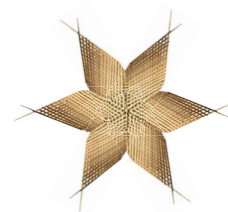
Photomontage. Early design concept.



We see ourselves on a road, moving forward, progressing down some linear track that promises constant improvement and discovery, from cancer cures to life on Mars. Our eyes are forward, the past is of largely academic interest, the present only an instant we race through to arrive at a different tomorrow. In our belief system we dedicate ourselves to a single task: creating change.

But what if we did not have that conviction underlying our every thought, the conviction that tomorrow, for each of us, if we all work hard, there will be more and better everything?

What if our conviction was not that we were born to continue travelling down an infinitely changing road, but instead, that our destiny was to repeat what had been done before, to walk in the footsteps of all who had gone before, to think the same thoughts they had already thought; to take, in effect, their place on the slowly revolving wheel of eternally repeating existence? What if we defined our lives not as occupying new ground of our own discoveries but as revisiting ground already occupied by all our ancestors? Our predominant sense of self would be largely shaped by the conviction that we were going where others had gone before and where others would always go. We would be taking our turn at the wheel of life rather than moving ahead from where others had left off. The shape of existence would be circular, not evolving, but revolving.<sup>49</sup>



49 Ross, *Dancing with a Ghost*, 102-103.

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