# Culture, Community, Language, and Land: A Case Study of Co-management Led Marine Stewardship Education Resources in Nunatsiavut

By

*Quinna Fawn Laver*

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## List of Abbreviations

CWF – Canadian Wildlife Federation

DFO – Department of Fisheries and Oceans

ECCC – Environment and Climate Change Canada

HiAP – Health in all policies

IBED – Inuit Batchelor of Education Program

IQ – Inuit Qaujimajatuqangit

KWL chart – What I *know*; What I *want* to know; What I *learned*

LILCA – Labrador Inuit Land Claims Agreement

LISA – Labrador Inuit Settlement Area

LWSC – Lands and Waters Science Camp

NL – Newfoundland and Labrador

NLESD – Newfoundland and Labrador English School District

NG – Nunatsiavut Government

SES – Stewardship and Education Strategy

TFPC – Torngat Fish Producers Co-op

TJFB – Torngat Joint Fisheries Board

TS – Torngat Secretariat

TRC – Truth and Reconciliation Commission

TWPFS – Torngat Wildlife Plants and Fisheries Secretariat

UNDRIP – United Nations Declaration on the Rights of Indigenous Peoples

WWF – World Wildlife Fund

# Abstract

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Marine education plays a key role in equipping individuals and communities with the knowledge and skills necessary to manage complex challenges associated with our changing ocean. In Nunatsiavut – a unique self-governing Inuit territory in northern Labrador – being competent on the land and water has been integral to well-being, economies, and culture since time immemorial, and continues to this day. Consequently, there is a wealth of coastal knowledge and stewardship practices. The Torngat Secretariat – a co-management institution created under the Labrador Inuit Land Claims Agreement – has initiated the Paigitsiaguk project ("taking care of it" in Inuktitut) which is creating interdisciplinary education kits for schools in Nunatsiavut based on locally and culturally important species. This paper explores the Putjotik ("snow crab") kit, and investigates the diverse ways in which community-, land-, and place-based education can contribute to renewing a culture of marine stewardship. This study employs a mixed-methods qualitative research design by combining a narrative literature review and content analysis to analyze literature for calls for action on Inuit education and how they might be met by the Putjotik kit. This project also explores how Inuit, local, and scientific knowledge can be bridged and communicated within the bounds of the K-12 provincial science and social studies curriculum. Finally, this paper also explores the diverse ways in which co-management institutions such as the Torngat Secretariat contribute to sustainable marine stewardship, management, and self-determination through education interventions.

*Keywords:* Land-based learning, decolonize education, coastal communities, Nunatsiavut, Labrador, culturally relevant education.

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To the reader, I extend thanks for your curiosity to open this document. I hope you find what you're looking for and enjoy the journey getting there.

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Nakummek! Thank you!

"All flourishing is mutual."
Robin Wall Kimmerer, Braiding Sweetgrass (2013, p. 20)

# Chapter 1 – Introduction

## 1.1 The Nunatsiavut context

In 2005 the Labrador Inuit Land Claims Agreement (LILCA) was signed, and the new self-governing region of Nunatsiavut came into existence after half a century of advocacy and negotiation (White, 2023). This sub-arctic region of Northern Labrador has approximately 90% Inuit residents in five coastal communities; Nain, the administrative capital; Hopedale, the legislative capital; Postville, Makkovik, and Rigolet. Additionally, many Elders still alive today were forcibly relocated in the mid-1900's from other communities farther north such as Okak, Nutak, and Hebron (Brice-Bennett & Chartier, 2017). Communities do not have road infrastructure to connect them to the rest of Nunatsiavut or the larger province of Newfoundland and Labrador; people and goods travel by skidoo and komatik in the winter, boat and four-wheeler in the summer, and plane year-round, weather permitting.

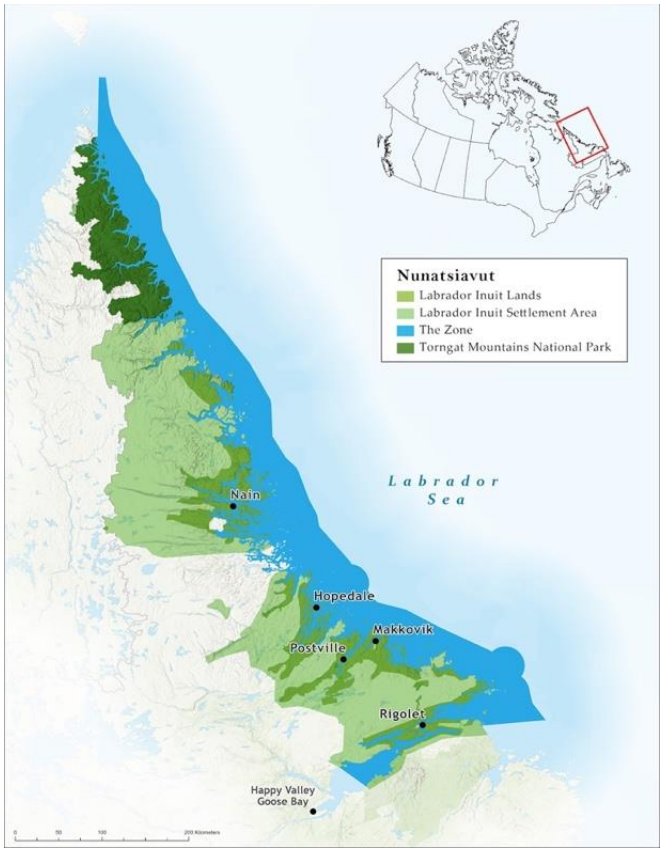



**Figure 1**. Map of Nunatsiavut lands and waters in the Labrador Inuit Settlement Area (LISA), courtesy Shawn Rivoire, Torngat Secretariat.

Nunatsiavut means “our beautiful land” in Inuktitut. This region is exposed to the cold and salty Labrador Sea and Davis Strait and is partially covered by subarctic boreal forest. Near the north tip of Nunatsiavut, the Torngat (“the place of the spirits”) Mountains jut out from the sea, looming as the tallest entities in Canada east of the Rocky Mountains. When I visited Makkovik and was taken out on the water I wondered aloud at the large boulders scattered along the ridges of the looming hills and was told by a knowledgeable resident and elected AngajukKâk of Makkovik, Barry Andersen, that this part of the world is in what geologists’ call “the boulder belt” (B. Andersen, personal communication, July 19 2023). The coastline of Labrador would stretch 20,000 kilometers if stretched out in a straight line (Thurston, 2011). I learned that each of the thousands of islands and headlands dotting the coast have both unique and shared names that often describe their utility or structure. Each bit of land that juts out into the ocean is worn by sea ice, wind, and waves year-round, making rocks smooth well above the high tide line.

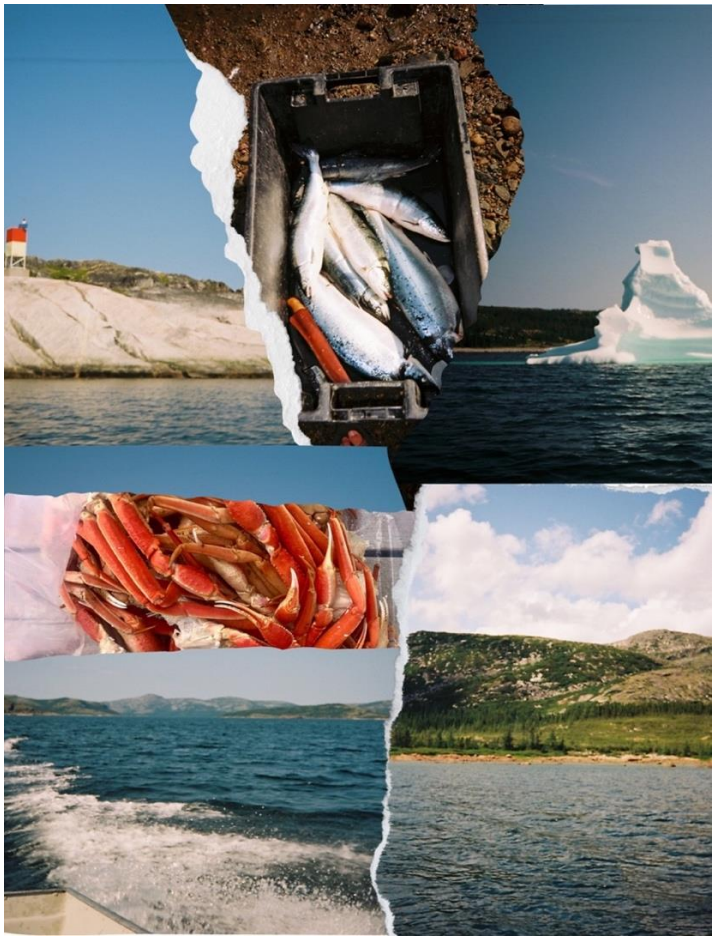


**Figure 2**. Photos taken in Makkovik and surrounding area, Quinna Laver, July 2023.

The Labrador Sea is an abundant cold-water marine ecosystem. Inuit knowledge states that Sedna and the sea creatures are early and fundamental facets of Inuit life (Labrador Interpretation Center, 2023). Inuit have been successful managers and stewards of their lands and waters since time immemorial; cultural values and practices ensured wildlife, plants, and fish remained abundant and healthy. Intergenerational knowledge passed to the present day also tells of how to adapt when certain species do not show up as predicted. As quoted in *The Atlantic Coast*, archeologist William Fitzhugh describes the difficulty in finding a place on the Labrador coast where Inuit have not actively modified the landscape (Thurston, 2011).

Inuit living in Labrador developed sophisticated hunting and sea-faring technologies such as Kajak, Kajait and Umiak vessels to hunt marine mammals, as well as for use in transportation in a highly mobile society that depended on both marine and terrestrial species, such as caribou (Nunatsiavut Government, 2019). Harvesting marine resources is a central way of life and subsistence (Brice-Bennett, 1977), and during the 15$^{th}$-20$^{th}$ centuries, Inuit adapted to a variety of commercial fisheries such as whale, seal, and cod. Today, the Torngat Fish Producers Co-op (TFPC) – which has been owned and operated by Inuit since the 1980's – purchases and produces regional seafood products such as northern shrimp, snow crab, and arctic char. At its employment peak in the 1990's, the TFPC also offered approximately three to four hundred well-paying jobs in fishing and processing industry and has improved local control and access to fisheries (Boutet, 2016). In discussions with Ron Johnson, the Assistant Manager of the TFPC, in 2023 the TFPC employed 89 people total on the coast of Nunatsiavut, 44 of which were employed at the Makkovik crab and fish processing facility (personal communication, R. Johnson, November 23, 2023). From 2019-2023 the overall snow crab purchased at Makkvoik from the TFPC was $7,370,000 Canadian dollars, and the labour paid to employees at the Makkovik processing facility for both snow crab and turbot was $3,031,000 (personal communication, R. Johnson, November 23, 2023). These statistics represent important seasonal employment and wages for people in the remote community.

The "Zone" – referenced in Figure 1 – is the marine area negotiated in the LILCA where the area is governed through co-management. Co-management in this case is a collaboration through an institution of public government called the Torngat Joint Fisheries Board. The Board's mandate is outlined in the LILCA and appointees to the Board are appointed by the

federal, provincial, and Nunatsiavut governments. This Zone extends 12 nautical miles offshore. Adjacent to the Zone are waters extending 200 miles offshore to the boundary of Canada's exclusive economic zone. The Board may also make recommendations in these offshore areas.

In the Labrador Sea, sea ice provides a productive ecosystem that supports abundant marine wildlife and unique fish communities. This area of ocean is influenced by the cold-water currents and supports life from abundant primary producers such as eelgrass, kelp, and phytoplankton, to large marine mammals such polar bears, minke whales, and multiple species of northern seals (White et al., 2018). Ensuring the sustainable management and stewardship of these marine resources in the Zone and adjacent area is particularly important for Inuit who live on the coast due to impacts on health, food security, culture (Darnis et al., 2012), economies, society (Kourantidou et al., 2021) and wellbeing (Snook, 2021).

Today, due to the remote location of communities in Nunatsiavut, being competent and safe on the land in a particularly harsh climate remains an important part of life. In 2007, a comprehensive food acquisition survey was completed and showed that on average 85% of households are active harvesters of country food on the land through activities such as berry picking, hunting, and fishing (Felt et al., 2012). The amount and diversity of species harvested vary by community and availability, but these statistics underscore the continued importance of local and country food. While not all households participate in going out on the land for country food, extensive sharing networks both formal – such as the Nunatsiavut Government community freezer program (Organ et al., 2014) – and informal ensure that country food is distributed to those who need it. Having a close relationship with the land is integral to living well and remaining in good health in Nunatsiavut; food prices at stores are high and the availability of goods can be precarious.

## 1.2 History of Europeans in the Labrador Sea

Like nearly all Indigenous regions, the Nunatsiavut history has been indelibly impacted by the interactions between Inuit and Europeans who came across the Atlantic to extract marine resources from their waters. European commercial fishing vessels have been in the Labrador Sea since the 1500's for species such as bowhead whale, salmon, and codfish (Rose, 2007). While there were some successful commercial trade relationships established between respectful fishing crews, Inuit have largely been fending off unwanted European settlement and extraction from the

coast, starting with the Basque Whalers in the 1570's (Nunatsiavut Government, 2019). By the 1700's, British, French, and American commercial fisheries were competing fiercely for control over the productive fishing grounds off the coast of Newfoundland and Labrador.

When fishing conflicts between the British and Inuit were in a particularly dire state of violence, Jens Haven, a Moravian Missionary, proposed to establish mission stations on the north coast of Labrador (Proctor 2020). These stations were established with the goal of moving Inuit north to free up fishing grounds in the south for the British to fish unencumbered. In the following years as mission stations were set up, Inuit were initially agreeable to the Moravians living on the land with them, signing three treaty-like documents for the Moravians to purchase the land. However, the Moravian's monopoly policy on the trade of seal skins for exchange of credit to be used exclusively at mission stores made life more difficult for Inuit over the course of the following years (Nunatsiavut Government, 2019). In the early 1900's, five boarding schools run by both Moravians and the International Grenfell Association (IGA) were established in Labrador, as the government of Newfoundland was reluctant to provide services such as education and medicine to remote communities (Proctor, 2020). Unlike other residential schools in Canada, schools were not administered under the Indian Act. However, often the impacts of these institutions remained the same: extracting children from their communities, land, language, and culture and instructing them in European values and practices.

This is all to say that the relationship between Labrador Inuit and multiple states has been continuously underpinned by the land and its resources. This relationship dynamic continues to this day with the Canadian state; Labrador Inuit continue to advocate for both their inherent and constitutionally protected rights to the land. Recently, the ratification of LILCA in 2005 has changed the way in which this relationship has played out by affirming more power and agency to Inuit to manage their own resources and support beneficiaries in Nunatsiavut and beyond, but there remains a social struggle for equitable access to fisheries (Snook et al., 2022; Snook et al., 2018). Furthermore, the Canadian state has signed the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP) (Government of Canada, 2021), increasing awareness and momentum towards Indigenous rights and self-determination within their respective territories.

## 1.3 Governance and self-determination

### *1.3.1 The Labrador Inuit Land Claims Agreement specifics*

The Labrador Inuit Land Claims Agreement (LILCA) is a comprehensive agreement between the Province of Newfoundland and Labrador, the Government of Canada, and the Labrador Inuit Association that covers a settlement area in northern coastal Labrador of 72,520 kilometers squared, as well as 48,690 square kilometers of the Labrador Sea (Rivet, 2020). Like other land claim agreements – sometimes called 'modern treaties' – LILCA stipulates Inuit jurisdiction over lands and waters as well as harvesting rights and established co-management boards to govern wildlife, plants, and fisheries. However, LILCA also includes extensive self-government provisions, as quoted in the preamble of the Labrador Inuit Constitution (2005):

*"[We] assert our inherent right to self-government and the right to continue, as we have always done, to determine our own political, social, cultural and economic institutions and our relationships with other peoples and their governments."*

The LILCA is also clear and strong in its assertion of honouring the Inuttitut language, cultural customs, and elders, as well as the importance of respecting all living things. Additionally, LILCA also reflects values of change, adaptation, and innovation for the benefit of Labrador Inuit (White, 2021). The Nunatsiavut Government (NG) has several departments that include Education and Economic Development; Health and Social Development; Lands and Natural Resources; and Language, Culture, and Tourism.

### *1.3.2 Formal education in Nunatsiavut*

The history of formal education initiatives is long and varied in Labrador, as chronicled by *A Long Journey: Residential Schools in Labrador and Newfoundland* (Proctor, 2020). Currently, primary and secondary education services are currently administered by the Newfoundland and Labrador English School District (NLESD), which is under the provincial Department of Education. The Nunatsiavut Government (NG) has the ability to take over jurisdiction of the public education system in Nunatsiavut through self-government provisions in the LILCA, however they have not yet done so. Considering the monumental task of creating new and equivalent curriculum and programs, as well as the high graduate rate (83%), this may indicate a level of satisfaction and success with the current education system.

At present, the Nunatsiavut Government's Department of Education and Economic Development provides funding for post-secondary education and technical training, as well as

providing Inuit cultural and Inuttitut language programming for Grades K-12. For example, the department has published a textbook and course on Labrador Inuit history for the high school level (Nunatsiavut Government, 2019), which was created under the specific requirements of the provincial policy for locally approved credits. This example demonstrations the ongoing control of NLESD and the province over education in Nunatsiavut, as well as the slight opportunities for community and local input within the system. As it stands, NG cannot develop and offer Inuit specific courses without collaborating with the province. The NG's Department of Education and Economic Development also hires Inuktitut language speakers and teachers to support education in the official language of Nunatsiavut. The Nunatsiavut Government is primarily focused on enhancing provincially established curriculum by localizing learning resources, including Inuit cultural components, and Inuktitut in order to reflect Inuit culture in school.

### *1.3.4 Torngat Joint Fisheries Board*

Despite the modern treaty, self-government and full autonomy is not represented in all aspects of governance. Commercial fisheries governance is a case where co-management was negotiated rather than fully autonomous decision-making power. While this form of collaboration is progressive, final decision-making authority remains at the federal level of the Government with the Minister of Fisheries and Oceans Canada.

While the Torngat Joint Fisheries Board (TJFB) may not have sole or final decision-making power, they have succeeded in advancing Inuit commercial fisheries values and priorities through research, recommendations, and public education (Cadman et al., 2022). The TJFB has shifted control of the research agenda in Nunatsiavut to further Inuit self-determination through projects such as the Fraser River char monitoring station and the post-season snow crab survey. These projects directly benefit fishers in a data-poor environment where the Department of Fisheries and Oceans (DFO) has not monitored consistently. The TJFB has made stewardship a priority by obtaining additional funding for a Ghost Gear retrieval project and creating stewardship education materials on best practices for the snow crab industry (Snook, 2023). Furthermore, the TJFB has employed sustainable oceans governance methods such as the precautionary approach (VanderZwaag, 2019) by voluntarily withholding snow crab allocations (Snook, 2023) which underlines co-management boards' role of combining local knowledge, research, and stewardship for sustainable management (Snook et al., 2018).

Co-management has been offered as an alternative governance scheme to the top-down control western fisheries management has provided. Sustainability is a trans-disciplinary process, in which co-management boards are well-positioned to weave together a "quilt" of sustainable governance concepts (Stephenson et al., 2021). Sustainable management practices are more likely to be upheld when communities have secure access to, are dependent on, and share in the management of the ocean and its resources (Armitage et al., 2017). Co-management regimes are entities that can facilitate and support connection to marine resources for the benefit of local communities' environmental, social, cultural, and economic well-being.

## 1.4 The Paigitsiaguk project ("Taking care of it")

The Torngat Secretariat has produced a Stewardship and Education Strategy (SES) (Blanchard, 2021) that includes the following strategic objectives:

1. Promote the ethics and practice of customary rules as relate to fish, wildlife, and plant resources.
2. Make stewardship and education a priority in the management of wildlife, plants, and fisheries.
3. Facilitate opportunities for youth to learn Indigenous life skills and norms, and to cultivate positive relationships with nature.
4. Strengthen knowledge and informed decision making.


**Figure 3.** Conceptual Framework adapted from the Torngat Secretariat's Stewardship and Education Strategy (SES) (2021). The long version of these principles of the SES are "Respect

for all living things", "Responsibility to care for the land and its people", and "Sustainable use of resources". The overarching goal of this strategy is to contribute to renewing a culture of stewardship, which has been an integral part of the Labrador Inuit ways of life for generations.

To contribute to meeting these objectives, the Secretariat is collaborating with Inuit educational experts to create culturally and locally relevant educational materials and resources for grades K-12. This stewardship and education project is named Paigitsiaguk ("taking care of it"). These resources are aimed to support teachers in the public school system. Educational materials are based on four species that were chosen by the Secretariat for their ecological, economic, social, and cultural importance: *Nanuk* (Polar Bear), *Putjotik* (Snow Crab), *IKaluk* and *kavisilik* (Arctic Char and Atlantic Salmon), and *Tuttusiugiannik* (Caribou). All of these species are co-managed. Each animal has its own kit with learning activities and accompanying digital and physical resources for teachers to use to help meet their curriculum requirements. Three of the four kits are based on marine species, underlining the connection and importance of the ocean to Nunatsiavummiut (Inuit from Nunatsiavut) ways of life.

The spirit of this co-management led project is to meet in the middle where education and stewardship interested converge. Wildlife organizations do not typically factor health and wellbeing into their programs; however, the Torngat Secretariat is taking a health in all policies (HiAP) approach by collaborating in the field of education (a social determinant of health), which has the potential to increase wellbeing and equity in resource management (Leppo et al., 2013). Education is a social condition of human wellbeing that is directly impacted by environmental conditions and management actions (Breslow et al., 2016). This project is one contribution to multiple youth engagement and education initiatives led by the Torngat Secretariat. The Paigitsiaguk project is led by Inuit educators and provides education kits to inspire and support teachers in Nunatsiavut. The learning activities and resources will be made available to schools and teachers to be implemented as they deem best for their students. There is diversity in educators in Nunatsiavut; from resident Inuit teachers to new teachers who have never been to the north before. By providing resources to professional educators in classrooms, the project will contribute to supporting teachers in their efforts to localize content and teach in a culturally relevant manner.

As an outsider, it seemed unusual to me at first that a wildlife management organization was seeking to influence the educational sector by creating resources and learning activities for

grade K-12 classrooms. Although other wildlife and fisheries organizations have created educational materials, I had not seen institutions such as Environment and Climate Change Canada (ECCC), the DFO, the Canadian Wildlife Federation (CWF), or the World Wildlife Fund (WWF) contributing to public education in the same way with substantial effort or local specificity. The Paigitsiaguk project transcends the usual western scientific boundaries around what an organization dedicated to managing wildlife and fisheries might pursue on the road to sustainable management by investing in integrational stewardship. The project is an investment in interdisciplinary education and skills acquisition, intergenerational knowledge transfer, and Indigenous stewardship, which are all integral to wildlife and fisheries management in Nunatsiavut. This project bodes well for future stewardship and contributes to goals in self-determination.

### *1.4.1 Putjotik ("Snow crab") kit*

Snow crab is one of the most important marine species to Inuit in Nunatsiavut because of its high economic value and contributions to the community of Makkovik. Snow crab has provided the steadiest profitable commercial fishery in Nunatsiavut over the last three decades (Boutete, 2016). This fishery has historically employed approximately 120 people in the community of Makkovik (population 350) annually. However, the fishery is currently in long-term decline for a variety of factors including increasing ocean temperatures, changes in trophic structure causing increased predation, and fishing (Mullowney et al., 2014) and employment has dropped to approximately 30-60 people per season (personal communication, Ron Johnson, November 10 2023). These seasonal jobs are well-paying a locally based, which are attractive prospects for some workers in the natural resource industries who do not wish to leave their home community for weeks at a time to work other resource jobs (ex. mining or hydroelectric).

Snow crab is a priority species for the Torngat Joint Fisheries Board and an excellent candidate for the basis of an education kit that explores the fishery and the larger marine environment. Snow crab is an excellent conduit for learning given its complicated lifecycle, commercial and cultural importance, and variety of habitat usage. Commercial fishing has been taking place in Nunatsiavut for over 500 years and has become a way of life (Snook et al., 2022). In addition, there is currently a push for marine spatial planning and a marine protected area off the north coast of Nunatsiavut under the *Imappivut* ("Our Waters") initiative. Furthermore,

several new discoveries of marine biodiversity made by both scientific inquiry and fisher knowledge (Adey, 2021) on the Labrador shelf bioregion have increased interest and opportunities for inquiry. Finally, with climate change increasing the accessibility of Arctic waters, it is integral that upcoming generations in Nunatsiavut are equipped to decide what is best for their changing waters.

## 1.5 Management problem and research questions

As explored in this chapter, the management problem in this research is multifaceted. In the context of co-management, renewing a culture of stewardship of marine and terrestrial species is the main goal of the Paigitsiaguk project. By working in a shared space with educators, supporting teachers to provide Inuit-centered learning activities and resources expands this pursuit. Taken together, the collaborative objective for the Torngat Secretariat becomes to create place-based, culturally relevant education materials and resources for schools in Nunatsiavut to facilitate environmental stewardship.

Working with the case study of the Putjotik kit, my research questions are as follows:

1. *What calls to action on Inuit education are featured in literature?*
2. *How does the Putjotik kit answer calls to action identified in the literature?*
3. *What other themes are present in the Putjotik kit?*
4. *How can the Putjotik kit contribute to an Inuit-centred, localized education that facilitates marine stewardship?*

# Chapter 2 – Methodology

This research is a case study of the Paigitsiaguk project's Putjotik kit that was created over the summer of 2023. To complete this case study, I used a mixed methods approach by combining a narrative literature review with both inductive and deductive content analysis. In this chapter, I position myself alongside the work and present methods.

## 2.1 Positionality statement

I am a woman and a settler of Scottish and British ancestry who grew up in the unceded lands and waters of overlapping Kwakwaka'wakw and Coast Salish Territory on the eastern coast of Vancouver Island in Comox, British Columbia. Much of my childhood was spent on the beach with my sisters' catching crabs for races, running along the slippery cobbles to the water's edge, digging trenches to get horse clams, taste testing seaweeds, and feeling sand skates burry under our feet. My father, Matthew Laver, is a carpenter and sixth-generation Canadian of Germanic and Scottish ancestry who grew up in rural Bowser, B.C. He taught me the value of hands-on work and instilled in me a love of the woods, canoes, and sub-alpine ecosystems. My mother, Karen Argyle, is an adopted daughter of first-generation British-Canadian parents. She stayed at home with my sisters and I for the majority of my childhood before becoming an Educational Assistant at my local high school. Among many other skills and values, my mother taught me to love and respect plants as well as to appreciate a wide range of literature. I benefited from two parents who enjoyed taking us on long walks, picking berries and mushrooms, camping, hiking, canoeing, and swimming. My connection to place was also sustained by the small hobby farm that I grew up on which included chickens, sheep, and a large vegetable garden.

The Salish Sea was my constant companion during my undergraduate work at the University of Victoria that focused on ethnoecology and human-nature relationships from both feminist and Indigenous lenses. After my undergraduate degree, I worked for the Parks Canada Agency for five years. There I observed synchronies and tensions between what land management and stewardship meant from the perspective of the federal government and partnered First Nations who have unresolved land claims to the lands and waters of the Gulf Islands National Park Reserve. With this background, I became interested in Indigenous land

management practices and values that allow natural resources to thrive in relationships with people.

It is critical to me that the work I complete at Dalhousie University supports the goals and vision of the people and communities I work with. For this project I was fortunate to partner with a co-management institution, the Torngat Wildlife Plants and Fisheries Secretariat (TWPFS). When approaching Dr. Jamie Snook, my would-be supervisor and Executive Director of the Torngat Secretariat (TS), I was interested in the ways in which Inuit envision and enact marine management and stewardship and how I could be involved in supporting this vision. When learning about the Paigitsiaguk Project (Paigitsiaguk means "Taking care of it" in Inuktitut) and contributing to the Co-management Commons, an easy partnership emerged due to our converging interests. As one mutual interest of many, I believe there is so much information out there, scattered, and often inaccessible – hidden behind paywalls and in university and government institutions – that never gets to the people who need it. Both the Paigitsiaguk project and Co-management Commons seek to mobilize Indigenous knowledge and western science for sustainable, collaborative, and self-determined stewardship of natural resources. I am grateful for the invitation to work on this mutual endeavor to create things that are relevant and useful.

In recognizing that I am a newcomer and guest to Labrador and Nunatsiavut, it was important for me to develop relationships and take guidance from Inuit educators, community members, and researchers. Educators Ola Andersen, Dr. Sylvia Moore, Colleen Pottle, Elder and translator Sarah Townley, and Nunatsiavut Director of Education, Jodi Lane, provided guidance, shared resources, and modeled through their actions the ways in which the project should head. I do not have any training in teaching, but with the Paigitsiaguk project teams' help I was able to collaborate to create the Putjotik kit with my background in marine management and ocean ecosystems. I was grateful for the generosity shown towards me in sharing the specific vision for the purpose and value of these education kits.

I would also like to express my gratitude for the people who showed me Makkovik, the community in Nunatsiavut where much of the snow crab fishing and processing is based. Torngat Joint Fisheries Board member Chesley Andersen, and AngajukKak, Barry Andresen, were generous enough to take me out on the water to fish and also introducing me to people in the snow crab industry. Nunatsiavut showed me its abundance and beauty and demonstrated the need for land-based skills to thrive on the north coast of Labrador. While these experiences and people

are not directly reflected in the research methodology component of this project I completed, I believe the Putjotik kit would be a shadow of itself without time on the water, in community, and with people.

## 2.2 Co-management research approach

Inuit in Canada are one of the most researched peoples in the world and that research has been characterized by racism, deficit-mindset, and extractive practices (Inuit Tapiriiti Kanatami, 2018b). In the past, research and consequent decisions concerning Inuit have been funded, designed, and completed by outsiders without Inuit research priorities in mind. Colonial research and management practices continue today with management decisions regarding terrestrial animals such as caribou and multiple fisheries disproportionately affecting Inuit livelihoods (Snook et al., 2020; Kourantidou, 2021). These decisions do economic and cultural damage to people who feel the significant consequences when access is denied, which reinforces systems of inequitable access. Multiple calls to action have been made to rectify research injustices in the Inuit territories. These include incorporating Inuit Qaujimajatuqangit (IQ) into all aspects of research, engaging youth (Pedersen et al., 2020), strengthening relationships and trust between Inuit and scientific communities through collaboration (Henri, 2012), and the establishment of entities that regulate research such as the Nunatsiavut Research Centre.

Despite the compounding effects of colonialism, extractive research, and management decisions being imposed upon Inuit, communities remain knowledgeable, resilient, and have shown they are capable managers of coastal resources (Cadman, 2022; Kendrick, 2013). Bennett et al. (2018) identifies supporting Indigenous-led research as a key element to ensuring marine access for Indigenous communities across Canada. Co-management boards are well-positioned as research leaders to build adaptive capacity in a changing Arctic due to their role in knowledge generation and integration (Armitage et al., 2011; Berkes & Armitage, 2010; Dale, 2009). Furthermore, co-management boards have been vehicles for research and management that reflect local priorities and values (Cadman et al, 2022). In this case, the Torngat Secretariat is positioned as an ideal organization to lead research in Nunatsiavut considering its mandate, extensive network, and research experience (Snook, et al., 2018).

In many cases, including my own, researchers can benefit in multiple ways from joining pre-existing or identified priority projects led by co-management boards. By collaborating with

co-management institutions, researchers are more likely to avoid extractive or incompatible research. Co-management boards have vision and mandates that are essential to identifying research that aligns with local concerns. In this case, the Torngat Secretariat's vision is to support healthy ecosystems and communities, and their mission is to enhance sustainable use and management of wildlife, plants, fisheries, and their habitat. As the mandate was already laid out by experts, I found it much easier to produce research that contributes to priorities set by an Inuit co-management organization.

To complete research in a way that is relevant, useful, and supports self-determination, I aligned myself with the goals of the Torngat Secretariat. By collaborating on a pre-existing project, I was successful in meeting my personal and professional goals of completing research that is valuable to the region. I benefited immensely from the human resources, funding, network, and partnerships the Torngat Secretariat already had in place for the project. For example, the Secretariat had already identified the necessary team of education experts to lead the project, had funding for materials, translation, and travel, a body of literature and published works, a network of people who were willing to host me, and was partnered on other education projects that I could learn from. Considering the short timeframe of this master's program, identifying and completing collaborative and/or community-based research in a region the researcher is unfamiliar with would be almost impossible without knowledgeable and well-connected mentors. Partnerships with researchers can be useful for co-management boards as well, considering these institutions are often overstretched and under resourced (Snook et al., 2018). If researchers come with flexibility and open minds, easy partnerships can emerge.

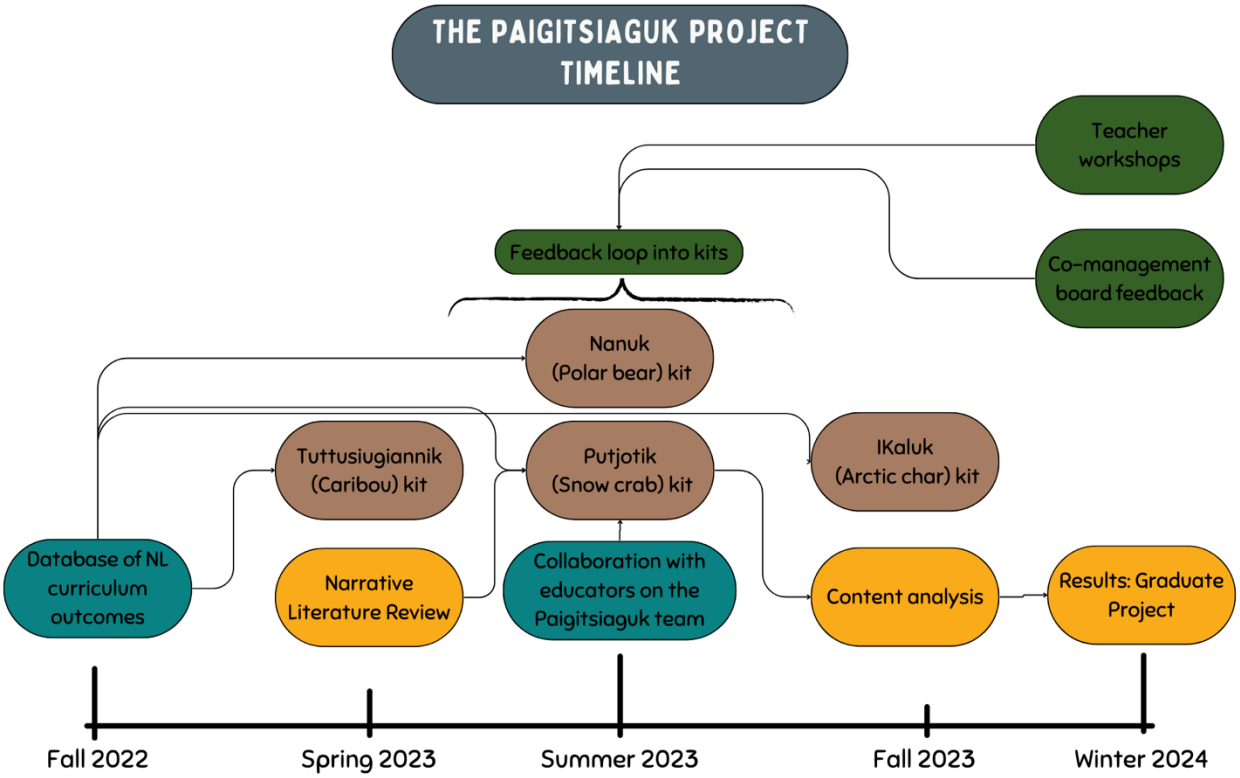



**Figure 4.** Timeline of the Paigitsiaguk Project thus far from fall 2022 projected into winter 2024. Turquoise indicates work completed by the Paigitsiaguk project team educators that fed into the education kits. Education kits are indicated in brown. Yellow boxes indicate methods and results of this paper and analysis. Green indicate sources of feedback; co-management boards will review the contents and teachers in all five communities in Nunatsiavut will have the opportunity to provide their feedback in workshops once all kits are complete.

## 2.3 Literature Review: Narrative and practical

As a newcomer to Nunatsiavut work, completing a thorough scan of academic literature, theses, and gray literature sources was fundamental for me to be able to contribute to the Paigitsiaguk Project. This broad scan contained gray and scholarly literature on land-based learning, Inuit education, co-management, fisheries in Nunatsiavut, and Inuit food sovereignty and wellbeing. To generate snow crab content, scholarly literature, gray literature, theses, and news content was reviewed under the topics of co-management of the snow crab fisheries and snow crab habitat and life history more broadly.

Additionally, I completed a narrative review of documents pertinent to education in Nunatsiavut. Narrative literature reviews are broad, selective reviews that are not comprehensive, but that seek to identify what has been written on a subject for a specific purpose (Pare et al., 2015). The goal of this review was to identify themes and concepts that a culturally relevant and place-based education could be built on in this context. It was not a prioritization process, but a qualitative analysis to identify what educational materials and resources should contain and look like in order to align with locally, nationally, and internationally identified priorities.

Themes – termed "calls to action" for the purposes of this paper – from these reports and articles emerged to form a theoretical base that is eventually used to explore how the Putjotik kit aligns with calls to action featured in the literature. Four (4) articles were chosen due to their direct content on education practices, theory, and case-studies in Nunatsiavut. The remaining four (4) are high-level documents with national and international implications. These documents are listed in Table 1.

Practical and broad definitions of themes were interpreted from the documents through a grounded theory process of coding, category creation, selecting core themes, and finally developing theory from the literature (Birks & Mills, 2015). The theory is captured in a resulting framework (Figure 5) available in Chapter 3. The framework is limited due to the amount of literature reviewed, but uniquely helpful for this project and subsequent analysis of the Putjotik kit. I conducted the narrative literature review in NVivo.

**Table 1.** Literature reviewed for themes/calls to action. A range of Inuit governance levels was chosen to represent different perspectives.

| International | National | Regional |
|---|---|---|
| Final Outcome document from the 2018 Inuit Education Summit (Inuit Circumpolar Council) | Calls to Action (Truth and Reconciliation Commission (TRC), 2015) | Inuit-Centred Learning in the Inuit Bachelor of Education Program (Moore et al., 2016) |
| United Nations Declaration on the Rights of Indigenous Peoples (United Nations (UN), 2007) | The National Inuit Strategy on Education (Inuit Tapiriit Kanatami, 2011) | *Illiniavugut Nunami*: Learning from the land: Envisioning an Inuit-centered educational future (Obed, 2017) |
| | | *Pigiasilluta oKalagiamik*: Culturally Relevant Assessment in Nunatsiavut (Anderson & Lane, 2020) |

| | | |
|---|---|---|
| | | Toward *Inummarik* (well-balanced humans): an investigation of the role of land-based learning programs in public education (Snow & Obed, 2022) |

## 2.4 Database of NL curriculum outcomes

To create learning activities that align with the government of Newfoundland and Labrador's curriculum outcomes, a database of curriculum requirements had to be created. This task was completed by a local Inuk education specialist, Ola Andersen, who holds a master's degree in education and decades of experience in classrooms. Ola spent four months of part-time work identifying learning outcomes that are compatible with infusing Inuit content and align with stewardship concepts. Ola prioritized science and social studies learning outcomes as the goal of the project was to create learning activities and resources that bridge western scientific and Inuit knowledge in relation to culture, identity, and stewardship.

The resulting document is organized from kindergarten to grade 12 that identifies applicable science and social studies learning outcomes that are suitable for learning activities grounded through an Inuit lens. This list of learning outcomes is a portion of the total learning outcomes, as much of the curriculum has no direct reference to Inuit or environmental stewardship. The process of identifying relevant curriculum is integral to the utility of these kits in classrooms, as teachers are required to meet mandatory curriculum outcomes. By creating resources and learning activities that are grounded in Inuit culture and stewardship, but that also directly tie to mandatory curriculum, teachers are more likely to incorporate the kits into their teaching throughout the year, rather than viewing them as supplementary.

## 2.5 Creation of learning activities as method: The Putjotik kit

The Putjotik kit is similar to the concept of science kits or education kits that are passed from classroom to classroom to assist and inspire teachers to meet their curriculum requirements. These kits typically have both physical and digital resources, as well as suggested learning activities or lesson plan outlines for teachers to draw from. The Putjotik kit is much like these kits, however its resources and learning activities are particularly context specific and are based on a crustacean as a conduit for learning. As the primary coordinator of the Putjotik kit, I used calls to action from the literature, as well as the curriculum database as central pillars for

learning activities and resources. I wove in appropriate concepts and content, often enhancing curriculum learning outcomes set by the Province of Newfoundland and Labrador with additional Inuit knowledge and stewardship activities. Additionally, I worked directly with the Paigitsiaguk project team members who lead the work, having meetings with the lead of the project approximately once a month to check in. I also visited the project lead in Makkovik for a week in July and was able to spend a few afternoons learning from the project lead. The resulting twenty (20) learning activities and resources span grades, social studies and science curriculum, and western science and Inuit knowledge in the same lessons. The full list of twenty learning activities can be found in Appendix B and two examples are available in Appendices C and D. Teachers are positioned as facilitators between youth and knowledge holders, Elders, student peers, and the land. Teachers are welcome to use the resources as they see fit for their students and community contexts. These kits are meant to evolve; there are learning activities that ask students to contribute to the kit before passing it along to the next school. As such, this kit will continuously adapt, marking this paper's analysis and discussion incomplete.

### *2.5.1 Deductive Analysis*

Using deductive analysis (Bingham 2023), I completed a systematic review of the learning activities outlined in lesson plan documents and their corresponding resource materials, both digital and physical. Deductive analysis was used considering the strong theoretical framework available from the narrative literature review completed (Caulfield, 2023). Codes were created in advance from the theoretical base from eight (8) key documents and then held up to the kits. My goal was to analyze how the Putjotik kit aligns with calls to action identified in the narrative review, thus answering my second research question. Finally, due to my outsider status, lack of teaching background, and the ongoing nature of this work, I view this process as an opportunity to celebrate success but also find areas for improvement in the kit.

### *2.5.2 Inductive Content Analysis*

While it is useful to determine how the Putjotik kit meets pre-existing calls to action from literature, this project is unique and therefore I was interested to see if there were novel themes or patterns that emerged from the lesson plan data. Considering this project to create supplemental stewardship education kits is being led by a co-management board in Nunatsiavut

and each kit is based on a different culturally important species, it was likely new themes would emerge that are not currently reflected in the literature. I used a five-step process to organize, sort, understand, interpret, and explain the data presented (Bingham, 2023). Starting by familiarizing myself with the data, I created codes that were sorted into larger themes (Caulfield, 2023) for interpretation and exploration. The goal of this analysis was to detect and describe patterns and then interpret why the patterns might emerge, which is a strength of qualitative content analysis (Morgan, 1993). A complete list of codes is available in Appendix A2 and discussed in detail in Chapter 3.

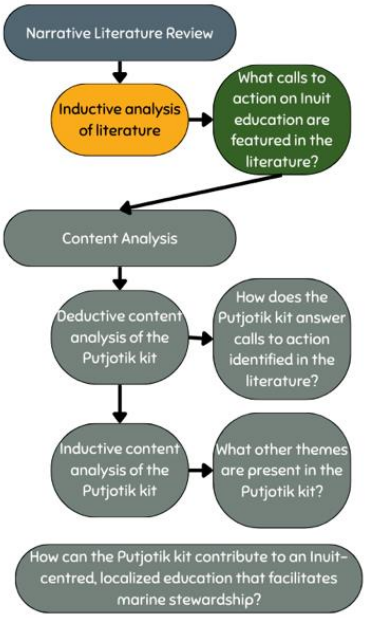
**Table 2.** Outline of mixed methods approach. Narrative review and database of curriculum completed in advance to create the Putjotik kit. The Putjotik kit was then analyzed for its contributions to calls to action (deductive analysis) and its emergent themes (inductive analysis).

| **Phase 1 – Pre-Putjotik Kit Creation** | | |
|---|---|---|
| **Database** | **Content Analysis Type** | **Result** |
| 8 key documents | Inductive Analysis of articles in narrative literature review | Framework of featured calls to action on Inuit education |
| **Phase 2 – Post Putjotik Kit Creation** | | |
| **Database** | **Content Analysis Type** | **Result** |
| Putjotik/Snow Crab kit | Deductive Analysis | Analysis in results – how is the Putjotik kit contributing to meeting calls to action? |
| Putjotik/Snow Crab kit | Inductive Analysis | Analysis in results – emergent themes/concepts. |

# Chapter 3 – Results

Through a mixed methods approach, I collected qualitative information to answer my research questions. The narrative literature review data was coded and analysed separately from the Putjotik kit data in NVivo. In this chapter I present calls to action or themes that were featured in the literature. I also present how the Putjotik kit meets these calls to action and explore how the kits learning activities and resources contribute their own emergent themes on what Inuit-centered marine stewardship education can look like in this context.

## 3.1 Narrative Literature Review: Featured calls to action




The following calls to action emerged from high-level strategic documents of international importance, as well as Nunatsiavut-based scholarly literature (Table 1). Four of these themes are directly related to content (*what* we teach) and pedagogy (*how* we teach) (personal communication, S. Moore, October 19 2023):

- Culturally relevant content
- Community-based learning
- Inuktitut Language
- Land-based learning

These four categories are explicit in the Putjotik kit and will be discussed in detail. An additional theme aggregated calls to action that are not necessarily tied to the content or practice of teaching but reflect other key Inuit priorities in education; this theme is called "Overarching priorities". Its sub-themes are predominantly outside of practical tools and content for learning and therefore more difficult to see directly in the learning activities through the coding process. For example, some sub-themes for this category include "Preparing students for post-secondary" and "Supporting students to stay in school", however, these sub-themes do not show up perceptibly in the content of learning activities. This theme is nonetheless important to discuss in relation to the Putjotik kit and its implicit contributions to many of the sub-themes; this will be explored further in Chapter 4. A sixth category called "Inuit Values" also emerged but is outside the analytic scope of this paper. The theme is discussed briefly in this chapter as the concept underpins much of this work.

Nunatsiavut-produced articles were selected for their timely local content by education practitioners and scholars. Unsurprisingly, the majority of strategic and policy-level calls to action emerged from high-level documents, while calls to action grounded in pedagogical tools, assessment strategies, and cultural activities for learning were more present in local literature (see Appendixes E1 and E2 for a comparison of word clouds). National and international level strategies and reports represented a broader vision for educational calls to action, while Nunatsiavut-based scholarly articles provided more examples, case studies, and on the ground content. For example, while national level documents called for investment, funds, and programs to be created to empower culturally relevant content and land-based learning, the regional scholarly articles provided specific examples of *how* that learning might come to fruition in classrooms. As one interview participant in Anderson and Lane's (2020) article states:

> *"… There are ways of meeting outcomes by doing certain Indigenous projects, whether its kamutik making, or snowshoe making, or making models of traditional Indigenous shelters that were used years ago, or even making mitts and slippers, and also making traditional lines for hunting seals and making gaffs. The opportunities are almost endless."* (Anderson & Lane, 2020, p. 360)

The featured calls to action found among these documents are not ranked by importance. Each one is integral to Inuit-centered learning in this context. Additionally, in practice these categories are not neat and discrete as presented in the following paragraphs and diagrams. Themes overlap and contribute to one another. For example, Inuktitut language can be seen as a part of land-based learning, an essential component to culturally relevant resources, and a holder of Inuit values. Furthermore, "Environmental stewardship" is a part of the "Land-based learning" theme but is also a part of broader Inuit "Autonomy and sovereignty" sub-theme identified in the "Overarching priories" theme.

This narrative review process allowed me to identify the ways that the Putjotik kit aligns with both locally and nationally identified Inuit priorities in education. While this framework is helpful for me as an outsider, this is not a representation of one Inuit educational truth. Breaking each theme into components and then building them back into a whole has ensured I can speak to each element of Inuit-centered education in this context on its own, as well as it's connections to other themes. The question of how educators should incorporate Inuit culture and pedagogy into

Euro-Canadian curriculum has been answered by many educators and practitioners. This analysis reflects and contributes to that growing body of literature.

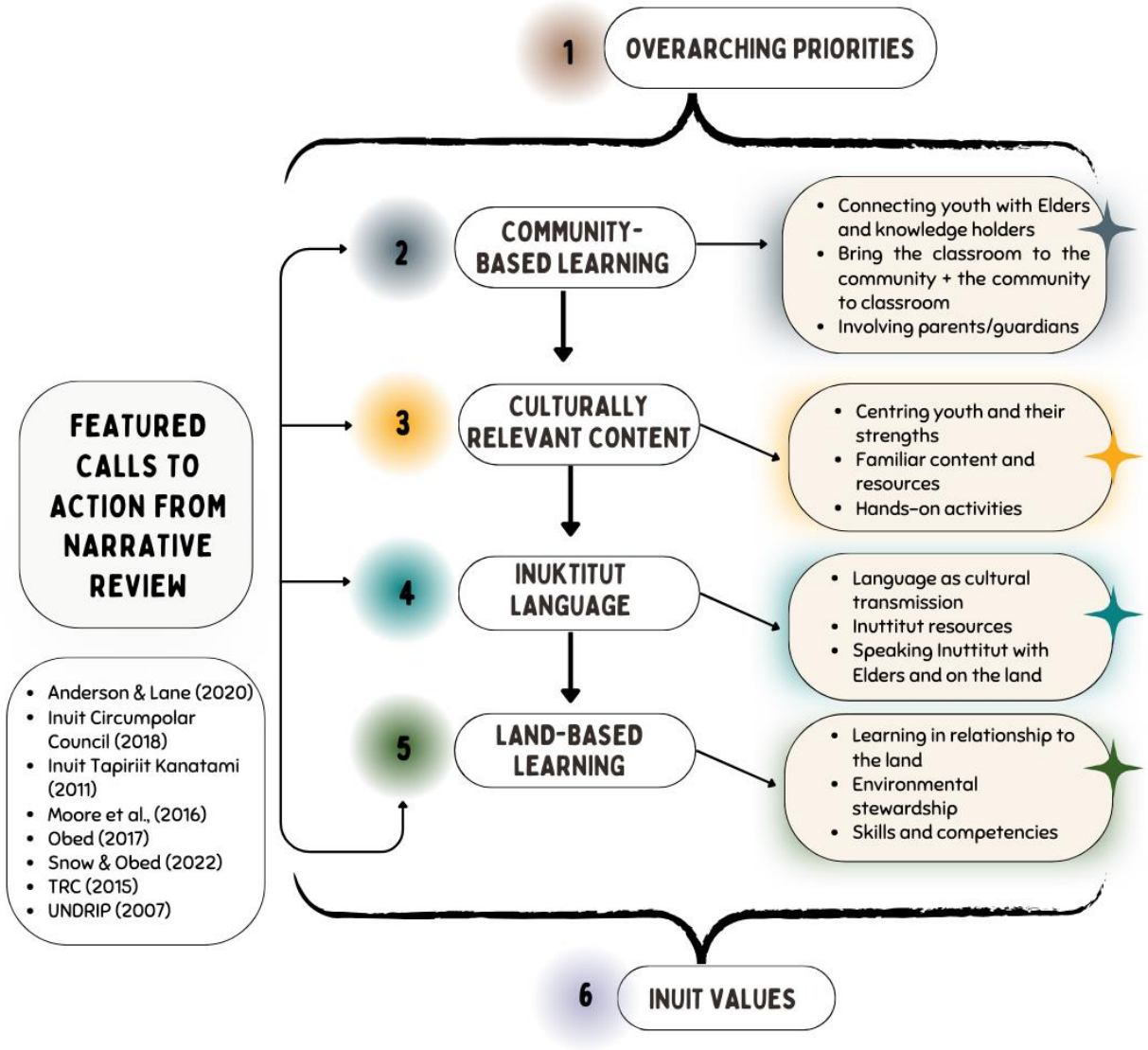
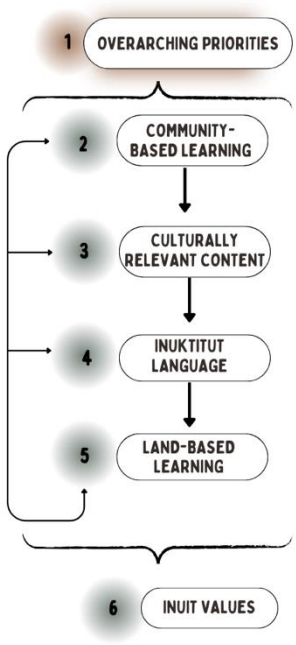



**Figure 5.** This figure illustrates the calls to action featured in the narrative review. The first level indicates the theme (call to action), with the second level representing sub-themes present. Sub-themes are specific calls to action that are nested within the larger categories and can contribute to the overall call to action. Four themes, "Community-based learning", "Culturally relevant content", "Inuktitut language", and "Land-based learning" can be easily identified in resources and learning activities through coding. The fifth theme, "Overarching Priorities" was created to capture sub-themes that are broader than teaching and content methods. The underlaying theme "Inuit values" is outside the scope of this analysis, however, was present in documents reviewed

and implicitly underscores much of the work. A detailed breakdown of themes, subthemes, and codes that contributed to this framework is available in Appendix A1.




### *3.1.1 Overarching priorities*

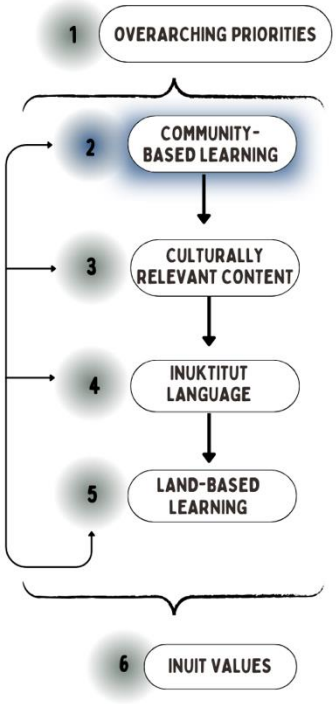
A catch-all theme was created to amalgamate calls to action on Inuit education that did not necessarily fit into learning activities but were present in the review. These priorities both encompass and feed into the other four themes (Figure 5). Sub-themes included in this theme include "Investing in the early years", "Modern education", "Multiple ways of knowing" and "Supporting students to stay in school" (Table 6), which can all be supported through the Putjotik kit, however, are difficult to pull out in the coding process. For example, the "Well-being" sub-theme can be seen implicitly in other themes; land-based learning contributes to the holistic wellbeing of Indigenous youth and wider communities as well as facilitates Indigenous ways of knowing (Burke et al., 2021), which are overarching priorities in education. These sub-themes are sometimes outside of the explicit scope of the Putjotik kit through the coding process but can still be contributed to by education kits and the wider Paigitsiaguk project through learning activities, resources, and assessment methods.

**Table 6.** "Overarching priorities" theme and sub-theme descriptions and examples. These "Overarching priorities" reflect wider calls to action on Inuit education. Investing in these sub-themes contributes to an Inuit-centered education, however many of them are outside the scope of individual learning activities. To see these sub-themes in the Putjotik kit, we must zoom out to see their interplay with other themes, as well as the context in which the education kits are imbedded.

| Overarching Priorities | Description of sub-theme | Presence in literature |
|---|---|---|
| **Autonomy and Sovereignty** | Education should reflect and support Inuit autonomy and sovereignty.<br><br>*"As a reaction to imposed education systems, traditional land-based education can be viewed as a source of resistance against a capitalist settler state, and most importantly, for the* | N = 5/8 |

| | | |
|---|---|---|
| | *maintenance of Indigenous autonomy and sovereignty"* (Snow & Obed, 2022, abstract) | |
| **Early-childhood** | Investments made in early-childhood education from pre-school to the age of 8.<br><br>*"Improve and enhance Inuit education systems at all levels, in particular early childhood, middle, secondary, and post-secondary learning in ways that reflect and strengthen our culture and give the best possible opportunities to Inuit"* (Inuit Circumpolar Council, 2018, p. 3) | N = 2/8 |
| **Global Citizens** | Education reflects how students are global citizens and have integral perspectives on a changing Arctic.<br><br>*"Mindful of the need to foster much greater growth in post-secondary training that is both appropriate for Inuit and which will allow Inuit individuals and communities to take advantage of wider global opportunities"* (Inuit Circumpolar Council, 2018, p. 2) | N = 5/8 |
| **Modern Education** | Education fit for the 21st century: adaptive, competency-based, and includes global forces as well as local ones. Supports living well today and into the future.<br><br>*"An Inuit education system should expect success and graduate students with a 21st century education."* (Inuit Tapiriit Kanatami, 2011, p. 70) | N = 6/8 |
| **Multiple knowledge systems** | Incorporating Inuit and western scientific knowledge systems as whole entities standing alone, but also seeing the benefits of blending when appropriate. Students experience how different knowledge systems may be useful in different situations.<br><br>*"Teaching Inuit knowledge systems alongside European colonial knowledge systems, and the ability to draw on which one is most useful in different circumstances, has a powerful potential to extend and deepen the learning for all (Barnhardt and Kawagley 2005)"* (Anderson & Lane, 2020, p. 366) | N = 5/8 |
| **Prepare for Post-secondary** | There is an educational attainment gap between Inuit and non-Inuit Canadians at post-secondary educational attainment level. The education system should prepare students for post-secondary.<br>*"It is an important goal for our children [in Nunatsiavut] to graduate from school and be eligible to further their education."* (Moore et al., 2016, p. 100) | N = 7/8 |
| **Right to self-determined education** | Right to establish and control their education systems and institutions. Provide education in their own languages, in a manner appropriate to their cultural methods of teaching and learning. | N = 8/8 |

| | | |
|---|---|---|
| | *"Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning."* (UNDRIP, 20, p. 13) | |
| **Supporting students to stay in school** | Using a variety of mechanisms to ensure school is useful and valuable to students and that students receive the adequate support (in school and at home) to graduate high school.<br><br>*"Acknowledging that disparities are sustained through colonizing pedagogy and that institutional biases result in the predictability of student performance, Inuit lag far behind others in dominant cultures in terms of formal educational success and in some cases this lag has achieved near crisis levels; Understanding that among the many ways of helping improve graduation rates is to address the significant socio-economic disparities faced by Inuit; Further Understanding that other ways to improve graduation rates is to address cultural and linguistic disparities"* (Inuit Circumpolar Council, 2018, p. 2) | N = 4/8 |
| **Well-being** | Education as a system to support identity and skill development. Ensures the physical, mental, emotional, and spiritual well-being of students.<br><br>*"Taking students outside to become active will benefit them physically and mentally. Instead of using blocks or pictures and sitting inside in a chair, we can use land-based activities to meet the mathematics curriculum outcomes. For example, berry picking is an important activity in our communities. Students could add and subtract with pieces of our land."* (Moore et al., 2016, p. 100) | N = 3/8 |



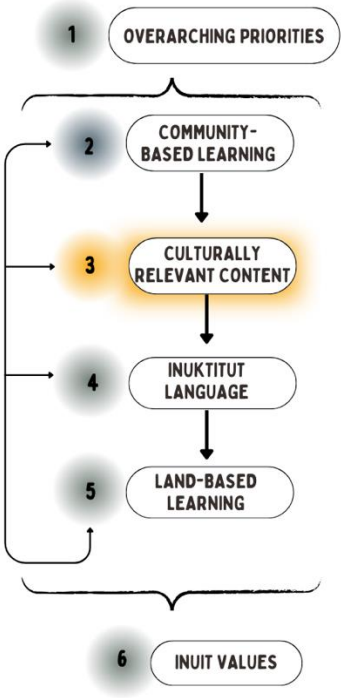

### *3.1.2 Community-based learning*

The "Community-based learning" theme and contributing sub-themes were present in seven of the eight documents reviewed. The sub-themes in "Community-based learning" include ensuring Elders, community members, and local knowledge holders are included in and held up as valuable teachers within the education system (Table 3). An education based on community values in this case means learning activities should be "Student centred", which means respecting and celebrating students' knowledge and perspectives (Anderson & Lane, 2020; Moore et al., 2016). Learning activities and assessments should focus on capturing the pre-existing strengths and abilities of students and provide support in the development of students' interests and goals. Through this lens, students become teachers and knowledge holders in the classroom through peer-to-peer learning and localized content.

**Table 3. "**Community-based learning" theme and sub-theme descriptions and examples.

| **Theme/Call to action** | **Description** | |
|---|---|---|
| **Community-based Learning** | Connecting students to their communities. Bringing in and respecting the knowledge and contributions of Elders, knowledge holders, and other community members. Education should reflect the culture and values of how communities would like to see their youth learning/experiencing in public/formal education.<br><br>*"Develop resources and provide training to help education leaders strengthen collaboration between schools and communities."* (Inuit Tapiriit Kanatami, 2011, p. 11) | |
| **Sub-Theme** | **Description of sub-theme and quotation example** | **Presence in literature** |
| **Elders** | Elders as keepers of cultural knowledge and as key participants in the education system.<br><br>*"Celebrating the incredible depth and breadth of knowledge and wisdom held by Inuit elders and others who continue to be the most important teachers Inuit have"* (Inuit Circumpolar Council, 2018, p. 2). | N = 6/8 |

| | | |
|---|---|---|
| **Local Knowledge** | Include local knowledge holders in learning activities. Celebrate and include local projects and information. Ground knowledge in local application.<br><br>*"Connection and relationships with knowledge acquired through direct immersion and experience rather than as abstract concepts engage learners holistically, thus anchoring that knowledge in a local context, needs, and values."* (Snow & Obed, 2022, p. 12) | N = 6/8 |
| **Parents and Guardians** | Support from home is necessary to transform education systems. Include parents, guardians, and family members in activities and create relationships with school.<br><br>*"v. Enabling parental and community responsibility, control, and accountability, similar to what parents enjoy in public school systems. vi. Enabling parents to fully participate in the education of their children."* (Truth and Reconciliation Commission, 2015, p. 2) | N = 5/8 |
| **Student-centered** | Students are competent explorers. Starting from a place that assumes students have valuable knowledge and experience to share, and that students can be teachers.<br><br>*"Students can also be producers of knowledge. In demonstrating the knowledge they have gained, students' learning products may, in turn, teach others."* (Moore et al., 2016, p. 103) | N = 6/8 |




### *3.1.3 Culturally relevant content*

The "Culturally relevant content" theme was present in all eight documents (Table 4). In this case, a culturally relevant education is one that is decolonized, or better, Indigenized. To meet this call, materials should be grounded in familiar images, text, persons, and experiences for students to best showcase, broaden, and deepen their learning:

*"When the subject matter is something that students can relate to, they have a base on which to build and this becomes meaningful learning that is easier to assess, is more relevant, and is reflective of the students' own journeys"* (Anderson & Lane, 2020, p. 368)

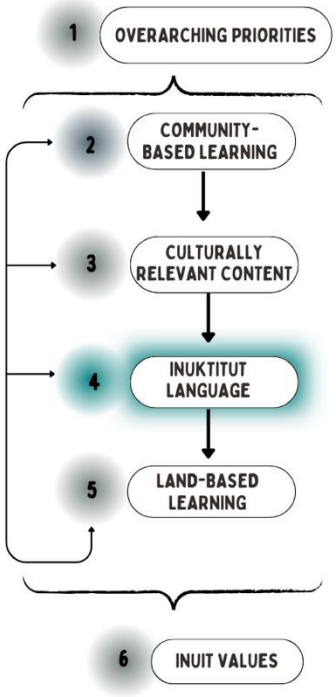
The United Nations Declaration of the Rights of Indigenous Peoples (United Nations, 2007) Article 14 identifies the foundational

right of Indigenous Peoples to control their education systems to reflect their languages and cultures. Furthermore, the Truth and Reconciliation Commission (TRC) (2015) affirms formal education in Canada should include Indigenous histories, knowledge, contributions, and cultures. Culturally relevant content can be defined in this case as learning resources and activities that reflect Inuit culture, knowledge, values, and worldview (Inuit Tapiriit Kanatami, 2011). Every community has their own unique vision for what successful education of their youth looks like. In Nunatsiavut, the vision for formal education is one that promotes Inuit values and culture by connecting students with the land and their communities (Moore et al., 2016). The formal education system should also play a part in preparing students for the lifestyle and career of their choosing. Finally, assessment methods must also be culturally relevant and uplift the pre-existing strengths of students (Anderson & Lane, 2020).

**Table 4.** "Culturally relevant content" theme and sub-theme descriptions and examples.

| **Theme/Call to action** | **Description** | |
|---|---|---|
| **Culturally relevant Content** | Learning resources, materials, and content that are relevant to Inuit culture, history, and worldview.<br><br>*"… Referencing and using learning resources that reflect Inuit and regional culture"* (Moore et al., 2016, p. 94) | |
| **Sub-Theme** | **Description of sub-theme** | **Presence in literature** |
| **Assessment** | Assessment should be culturally relevant and appropriate and take into count the needs of students. Assessment as a powerful tool for standardization.<br><br>*"… The development of assessment practices to capture competencies can help reveal the strengths in culturally relevant curriculum and instruction in Nunatsiavut"* (Anderson & Lane, 2020, abstract). | N = 4/8 |
| **Decolonizing and Indigenizing Education** | Shared space, making space for Indigeneity in colonial education system. Education ideally built on Indigenous worldview from the bottom up.<br><br>"*Although our results focus on the development of individuals, within our conclusion we extend the argument toward systemic changes needed in Canadian public education not only as an act of decolonization but in supporting the development of Innumarik*." (Snow & Obed, 2022, abstract) | N = 3/8 |

| | | |
|---|---|---|
| **Embodied** | Hands-on learning, active learning. Knowledge is transmitted through embodied activities such as going out on the land to practice a skill or learning language while engaging with the subject matter.<br><br>*"Many Indigenous scholars, along with Inuit knowledge holders and elders, affirm that land-based knowledge is often best acquired and retained through its tactile, sensory, and embodied practical engagement"* (Obed, 2017, p. 48) | N = 3/8 |
| **Familiar** | Content, resources, etc. should be familiar to students so they can connect with the materials and best showcase and deepen their knowledge.<br><br>*"Such teaching engages students' learning spirits (Battiste 2010, 2013), builds on prior knowledge, grounds learning in the familiar, supports the development of strong and healthy cultural identities"* (Moore et al., 2016, p. 95) | N = 3/8 |



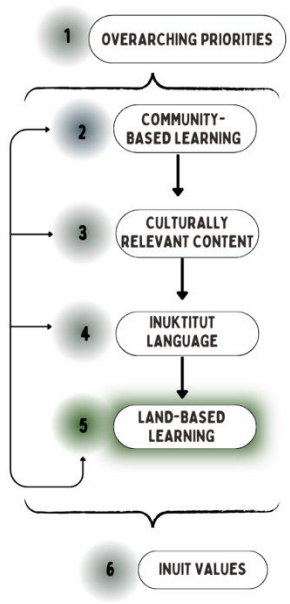

### *3.1.4 Inuktitut*

The call to action to include Inuktitut language shows up in all documents as an essential component for a self-determined and culturally informed education.

*"The foundation of implementing an Inuit-centred education system is a commitment to implementing bilingual education."* (Inuit Tapiriit Kanatami, 2011)

Inuttitut is the dialect of Inuktitut spoken in Nunatsiavut. Calls for action included bilingual education (Inuit Tapiriit Kanatami, 2011), having Inuktitut-based education resources and materials, and having Inuktitut-speakers in the classroom (Moore et al., 2016). The TRC's Calls to Action (2015) call for the preservation, revitalization, and strengthening of Indigenous languages across Canada, and states that this process is best managed by communities themselves with adequate funding provided. UNDRIP (2007) affirms education should be provided in the language of Indigenous cultures. Language is essential in the transmission of worldview, culture, and knowledge (Inuit Circumpolar Council, 2018); therefore,

this theme is closely related to and considered an integral part of culturally relevant education theme.




### *3.1.5 Land-based education*

Land-based learning is a pedagogy that has been identified by scholars in Nunatsiavut as foundational for Inuit education (Anderson & Lane, 2020; Moore et al., 2016; Obed, 2017 Snow & Obed, 2022). The call to include land-based activities into education was explicitly stated in five of the eight documents reviewed. Prominent sub-themes in this call to action are "Environmental stewardship", "Relational learning", and "Skills from land-based learning" (Table 5) all of which enable students to live a good life in Nunatsiavut. The land in Nunatsiavut refers to the land, water, and ice. The land has been a teacher and guide to living well in the Inuit Nunangat since time immemorial, teaching competencies such as patience, resourcefulness, problem solving, caring for others, and hard work (Karetak, Tester & Tagalik, 2017). However, land-based learning is not simply a fieldtrip or going outside, but a process of building skills, competencies, and relationships:

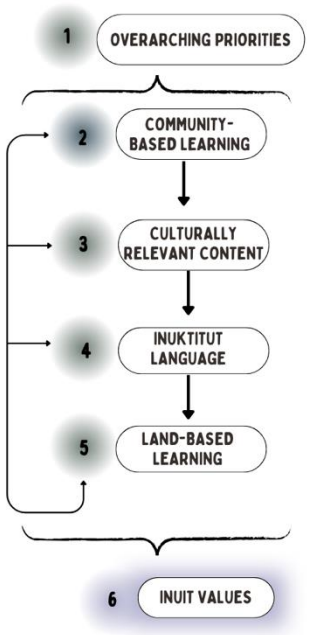
> *"… [land-based learning] supports the development of cultural competencies, language, and skills in relation to traditional learning underpinned by the cultural values of relationship-building with the land. With this definition, land-based learning could be conducted inside the walls of the school… is ideally situated outside in relation to the land and environment."* (Snow & Obed, 2022, p.8)

As reflected in Moore et al. (2016), teachers in Nunatsiavut are challenged to create land-based learning activities and activities that meet provincial curriculum outcomes considering that connection to land is a fundamental component of Inuit culture. Renewing a culture of land-based learning in the formal education system is an essential step forward in addressing educational inequities among Inuit youth and building social capacity and sustainable practices in the time of climate change (Obed, 2017).

**Table 5.** "Land-based learning" theme and sub-theme descriptions and examples.

| Theme/Call to action | Description |
|---|---|

| | | |
|---|---|---|
| **Land-based learning** | "Learning that supports the development of cultural competencies, language, and skills in relation to traditional learning underpinned by the cultural values of relationship-building with the land" (Snow & Obed, 2022)<br><br>*"Nurturing relationships with and on the land, re-situates Inuit within their element, which continues to foster Inuit leadership, tenacity, and resourcefulness. Land-based learning, as a foundation and basis for cultural knowledge production and renewal, actualizes agency and hones in and harnesses the natural wisdom and abilities of Inuit, while simultaneously shifting our frame of reference from deficit models to resiliency."* (Obed, 2017, p. 58) | |
| **Sub-Theme** | **Description of sub-theme** | **Presence in literature** |
| **Environmental Stewardship** | Positive, reciprocal relationships with the environment as a keystone of Inuit culture. Having respect for living things and ensuring conservation for future generations.<br><br>*"... Most important to us as parents are their values of taking care of the land, harvesting what you need, and sharing with your community."* (Anderson & Lane, 2020, p. 368) | N = 4/8 |
| **Life skills from land-based learning** | Skills obtained on the land are key for living well in Nunatsiavut. Examples: navigation, economic and subsistence practices such as hunting, safety practices, survival skills, identification, etc.<br><br>*"When asked what land-based knowledge meant to them, many participants spoke about having knowledge that is crucial to physical survival and safety such as navigation skills, spatial awareness, and land-reading"* (Obed 2017, p. 44) | N = 3/8 |
| **Relational Learning** | Learning in relationship with the land, and with knowledge holders.<br><br>*"For Inuit, learning often takes place as it relates to the self and how they interact with the living local world."* (Obed, 2017, p. 19) | N = 3/8 |




### *3.1.6 Inuit Values*

When sorting through themes from codes, "Inuit values" emerged as an underlaying theme that feeds into all other categories:

> *"One thing that is a given, though, is that we want our children to all be good people, grounded in solid Inuit values, traditions, and culture. And we do this by using all of these in our teaching."*
>
> (Anderson and Lane, 2020, p. 368)

A variety of Inuit values were present in every document reviewed. Moore et al. (2016) and Snow and Obed (2022) directly reference *Inuit Maligait* – the core laws of relationship between people and the natural world – identified by Elders in the National Strategy on Inuit Education (Inuit Tapiriit Kanatami, 2011). These include:

- Working for the common good
- Being respectful of all living things
- Maintaining harmony
- Continually planning/preparing for a better future

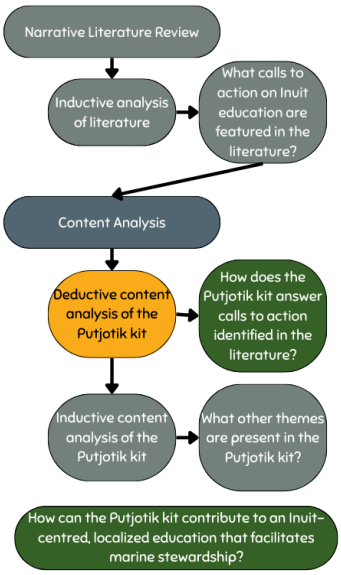
Moreover, *Inuit Piqujangit,* or communal laws, have also been identified by Elders:

- *Inuuqatigiitsiarniq:* showing respect and caring for others
- *Tunnganarniq*: being welcoming, open and inclusive
- *Piliriqatigiigniq:* developing collaborative relationships to work together for a common purpose
- *Avatimik Kamattiarniq:* environmental stewardship
- *Pilimmaksarniq:* knowledge and skills acquisition
- *Qanuqtuurunnarniq:* being resourceful to solve problems
- *Aajiqatigiiniq:* consensus decision-making
- *Pijitsirniq:* serving

Education in Nunatsiavut should also support the process of becoming *Inummarik* or a well-balanced human (Snow & Obed, 2022). These foundational values are ideally what an Inuit-centered education should be built on. They have enabled and continue to enable people to thrive in harsh and unforgiving Arctic and sub-Arctic climates. These values and laws are not explicitly stated as competencies or curriculum requirements in the Putjotik kit. However, the

Paigitsiaguk project is led by Inuit teachers for Inuit students, therefore Inuit values underpin learning activities and resources. Furthermore, each kit's species was identified by the Torngat Secretariat as important for life in Nunatsiavut. Holding up education kits up against the identified Inuit laws and values or explicitly incorporating them as competencies in assessment may be another path for inquiry or action in the future.

## 3.2 Deductive Content Analysis: Calls to action contributions




This section discusses how the Putjotik kit meets calls to action identified in the narrative literature review. Culturally relevant content, community-based learning, Inuktitut language, and land-based learning were foundational to the development of the Putjotik kit. The learning activities and resources contained in the Putjotik kit provide strong contributions to all four categories. Furthermore, the Putjotik kit explicitly contributes to the sub-theme "Multiple ways of knowing" from the "Overarching priorities" theme. Results from this analysis answer the research question: *How does the Putjotik kit answer calls to action identified in the literature?*

**Figure 6.** Components in the Putjotik kit include learning activity outlines (lesson plans) and many of the resources necessary to complete activities. These resources are physical, like science tools and books, as well as digital, like worksheets and PowerPoint presentations. This figure is meant to show a handful of examples of the resources available such as books and crocheted creations of the snow crab lifecycle (left and centre), an example of a learning activity outline (top, left of centre), an example of an Inuttitut language resource (bottom left), and PowerPoint slides from different presentations (right).

### *3.2.1 Community-based learning*

Community-based learning in this case includes Elders, local knowledge holders, parents, guardians, families, and reflects the values, knowledge, and priorities of communities. Over half of the learning activities (12) involve community-based learning (Table 7). For example, in two learning activities at the grade 3-6 level, students are asked to share their work with the wider community as a part of the assessment process. There are also lessons based in local history and primary sources by bringing students to visit the community's local museum to explore how fishing has changed over time. Alternatively, if the community does not have a museum students can bring items or artifacts from home. These lessons are designed to bridge the gap between schools and communities by both bringing the class to the community, as well as bringing community members into the learning environment either in the classroom or out on the land.

**Table 7.** Examples of community-based learning in the Putjotik kit, organized by grade.

| Grade | # of learning activities | Examples in Learning activities |
|---|---|---|
| Grades K-2 | 5 | Activity: *"Discuss the ways in which fishers prepare for seasonal changes. Contact a fisher and ask if they would allow the class to come to the dock to meet and talk about how they prepare for the season."* (K-2 – Lesson 3 – Snow Crab Lifecycle) |
| Grades 3-6 | 5 | Activity: *"Visit the local museum in town or have students bring items from home. Have students individually locate an ocean-related technology artifact that sparks their interest (ex. a boat/kayak, hook, net, anchor, trap, weir, engine, etc.), take photos of it and any information the museum has on it."* (3-6 – Lesson 1 – Nunatsiavut's Fishing History) |
| Grade 7 | 1 | Activity: *"Invite an Elder or local knowledge holder to discuss with students the relationship of Inuit with the ocean. Preferably meet with the Elder on the land where the class* |

| | | |
|---|---|---|
| | | *can interact with or view the ocean. Invite a guest speaker from Imappivut, the Torngat Secretariat, or a local group involved with ocean stewardship or fisheries management to discuss how they balance sustainable resource use and protection measures."* (7 – Lesson 2 – Marine Environmental Action) |
| Grade 8 | 1 | Activity: *"Invite a member from one of these [local] institutions to talk to students about the project and their role"* (8 – Lesson 2 – Ocean Basin Exploration) |

### *3.2.2 Culturally relevant content*

Culturally relevant content was present in almost all learning activities (Table 8). This theme includes subthemes such as "Hands-on learning", "Self-led discovery time", and "Traditional games". At a fundamental level, snow crab is a modern Inuit fishery that is present in the economic and social culture of communities in Nunatsiavut. Education activities built around snow crab are therefore entrenched in local culture and livelihoods. Culture is also reflected in the physical resources of the Putjotik kit, which includes crochet replicas of snow crabs in different stages of their lifecycles – fabric arts and crafts are popular cultural staples in Nunatsiavut – books on Inuit ocean knowledge, any many tools for investigating the ocean (Figure 8). A culturally relevant education in this case should also be grounded in familiar and local content. For example, when meeting all curriculum outcomes, the Putjotik kit draws from local ecosystems, histories, projects, and imagery that would be well-known to students (Figure 7).

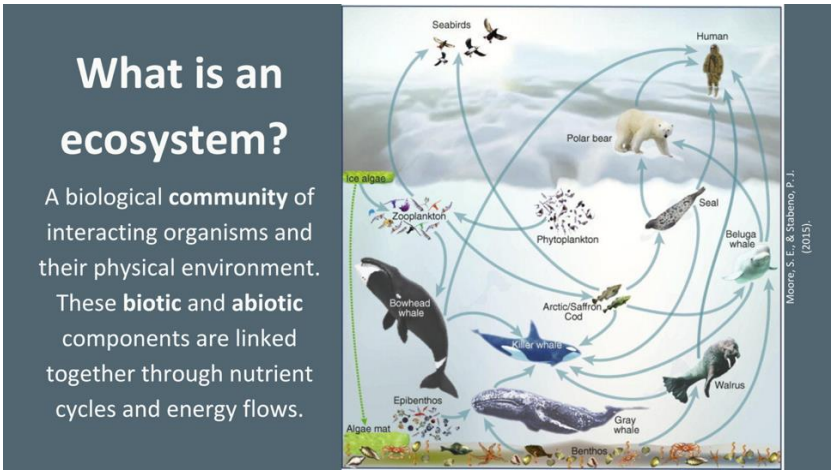



**Figure 7.** A slide from a slideshow in the Putjotik kit that uses the local and familiar marine ecosystem as an example to meet the provincial curriculum requirement to learn abiotic and

biotic features of ecosystems. This particular image was chosen also because of the presence of snow crab and its inclusion of people in the food chain, which aligns with Inuit cultural perspectives and localized food systems.

The Putjotik kit also met calls to action on culturally relevant assessment, as students are assessed through teachers' informal observation of engagement with discussion topics, guest speakers, or activities. Other modes of assessment include creating infographics, art pieces, audio-recording knowledge keepers, and other hands-on activities such as using traditional games to cement student learning. For example, after listening to a snow crab fisher about the ocean and the details surrounding their work fishing for snow crab, grades k-2 play a version of the traditional game 'button-button' (Hutchings, 2014) in order to embody stormy seas and the challenges to finding crabs in the vast and unpredictable ocean. Most lessons begin with a group sharing or discussion circle that centers students' pre-existing knowledge on the topic using teaching tools such as KWL chart (What I *know*; What I *want* to know; What I *learned*) (Table 8). In this way, students can share their knowledge and guide exploration.

**Table 8.** Examples of culturally relevant content in the Putjotik kit, organized by grade.

| Grade | # of learning activities | Examples in Learning activities |
|---|---|---|
| Grades K-2 | 8 | Activity: "*Gather in a circle to share what the class already knows about the ocean and what they would like to learn using a KWL chart. Share a poster with sea creatures and plants on it, asking students to identify each in both English and Inuktitut vocabulary. Discuss what is means to students to live next to the Labrador Sea and how the ocean is used in their lives (ex. Fishing, travel on sea ice or by boat, seal hunting, swimming, etc.).*" (K-2 – Lesson 1 – Introduction)<br><br>Assessment: "*Students draw or sculpt their favourite animal/plant who lives in the ocean or their favourite activity to do on, by, or in the ocean. All share why they chose this animal/plant/activity and one question they have about their ocean animal/plant/activity.*" (K-2 – Lesson 1 – Introduction) |
| Grades 3-6 | 4 | Discussion Question: *"How has the weather changed over the past couple of decades? Have you noticed changes in your lifetime or heard people talking about changes?"* (3-6 – Lesson 4 – Exploring Sea Ice) |
| Grade 7 | 1 | Activity: "*Invite an Elder or local knowledge holder to discuss with students the relationship of Inuit with the ocean. Preferably meet with the Elder on the land where the class* |

| | | |
|---|---|---|
| | | *can interact with or view the ocean."* (7 – Lesson 2 – Marine Environmental Action) |
| Grade 8 | 2 | Activity: *"Ask the students to answer the following questions first from self-knowledge and discussion with classmates, and then from reputable sources they find on the internet (students may use their phones or computers)"* (8 – Lesson 3 – Ocean Current and Waves)<br><br>Assessment: *"Choose one or more abiotic factors discussed or seen today. Create an artistic representation of the factors, how they interact, and their affects (positive and negative) on the ecosystems and organisms in the Labrador Sea."* (8 – Lesson 1 - Water Systems: Abiotic Factors in the Labrador Sea) |

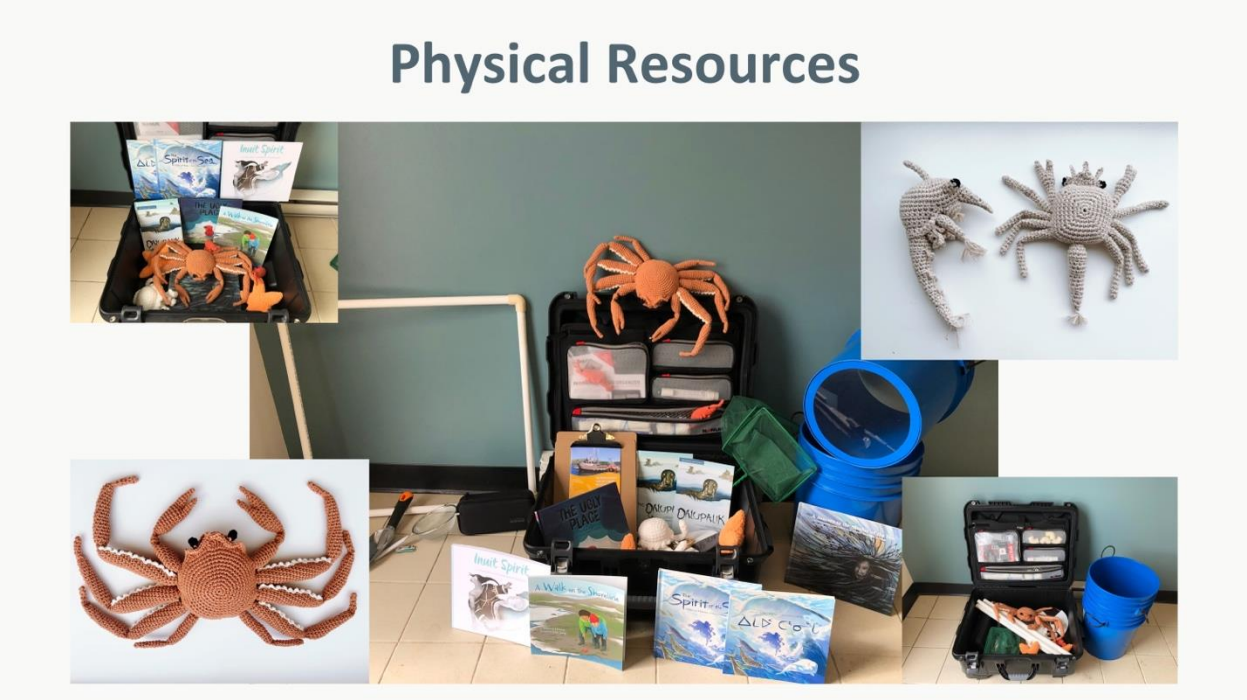



**Figure 8.** Photos of physical resources in the Putjotik kit. Resources include books on Inuit ocean knowledge in both English and Inuktitut, tools for quadrant surveys, temperature gauges, PH strips, viewing buckets, a go pro and protective housing, nets, clip bords, and crocheted starfish, jellyfish, shrimp, and snow crab. The crocheted snow crabs includes one adult male and one adult female snow crab to scale, and the two larval stages (Zoea and Megalopa) that are four-inches large for students to explore them at a suitable size.

### *3.2.3 Inuktitut*

The Putjotik kit contributes to meeting the call for increasing educational resources in Inuktitut. Four (4) out of 20 learning activities (20%) have Inuttitut resources for students to learn from, all within the K-2 learning activities. A respected Elder, translator, and educator working on the Paigitsiaguk project team, Sarah Townley, translated worksheet and posters into Inuttitut (Figure 9). Sarah is a retired Inuk educator and was the Inuit program specialist for NLESD until her retirement. These posters and worksheets are available digitally and the Putjotik kit also contains printed and laminated versions. However, the "Inuktitut language" theme is significantly less present overall in the Putjotik kit when compared to other themes. This could be because resources such as posters and vocabulary lists are easily identified as resources to be translated. In the upper grades, I found it more difficult to incorporate Inuttitut resources or identify them for translation. Additionally, it is much easier to find picture books aimed at younger grades in Inuktitut than textbooks or more technical resources for older grades. Two of the five books in the Putjotik kit are available in both English and Inuktitut (one symbolic and one phonetic). However, none that were specifically written in Inuttitut (Figure 10). As the Paigitsiaguk project is ongoing and the Putjotik kit can be modified, identifying areas for improvement is valuable.

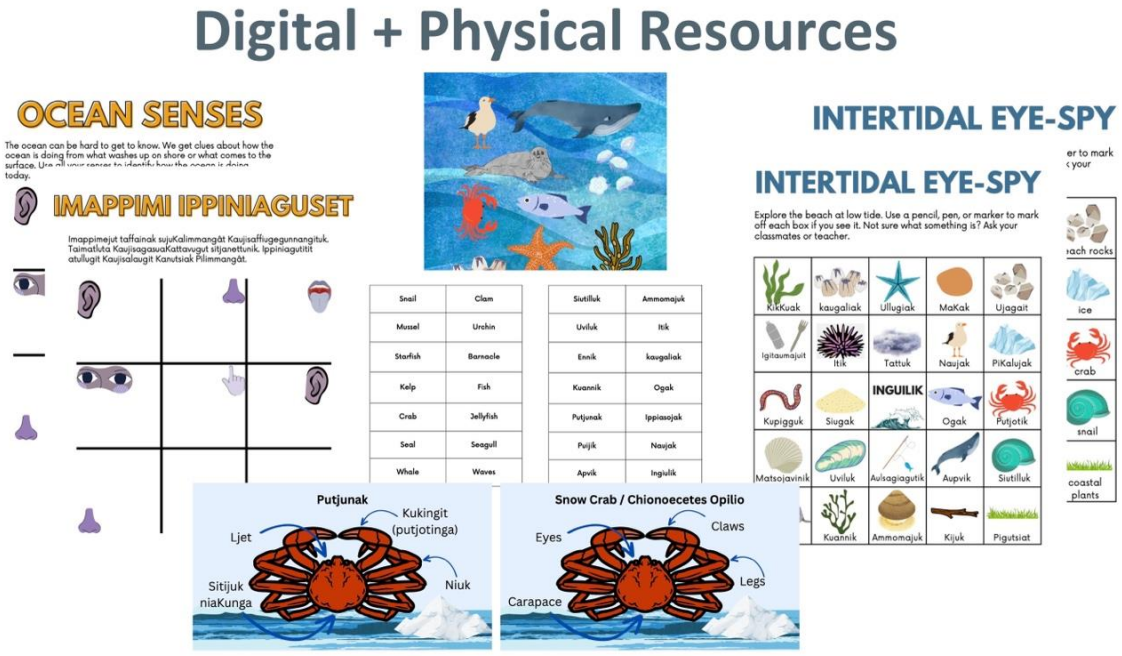


**Figure 9.** Inuttitut resources translated by Sarah Townley, a respected Elder and translator from Nunatsiavut, who currently works on the Paigitsiaguk project team. Worksheets designed to facilitate students learning the names of intertidal and ocean creatures and elements. Poster shows the snow crab body parts.


**Figure 10.** Inuit knowledge books in both English and Inuktitut. All are ocean-themed; two are about Sedna, the Goddess of the sea, one is about Qalupalik, creatures who live near the ice edge and who pose a danger to children, a colouring book, and two are about children walking the arctic shoreline and what they learn along the way.

### *3.2.4 Land-based learning*

Half of the learning activities (10) are land-based (Table 9). Applying and expanding knowledge on the land was present in many of these learning activities. Through this process, the land was both an instructor and an assessor of student learning. As defined in Anderson and Lane (2020), land-based learning can also happen within the classroom as long as the activities enhancing students' relationship to the land. For example, lessons "Grade K-2 – Lesson 1 – Introduction" and "Grade 3-6 – Lesson 4 – Exploring Sea Ice" do not necessitate bringing

students physically on the land at first. Instead, Elders and knowledge holders are invited as guides to prepare to go on the land and to reflect the importance of local and Inuit knowledge. Both learning activities also open with a student-centered discussion of youths' connection and relationship ship with the land (ocean and sea ice).

**Table 9.** Examples of land-based learning in the Putjotik kit, organized by grade.

| Grade | # of learning activities | Examples in Learning activities |
|---|---|---|
| Grades K-2 | 5 | Activity: *"Discuss with the class what students can expect to see on the beach. Invite parents/guardians/relatives along for this lesson as participants and/or chaperones. Students review their maps down to the beach beforehand and discuss as a class how they should prepare for the weather and activity. Once at the beach, start off exploration with worksheets "Intertidal Eye-Spy" and "Ocean Senses"; these sheets can be completed as a class. Afterwards, it is self-led discovery time for students to explore the intertidal zone for themselves."* (K-2 – Lesson 8 – Beach Day) |
| Grades 3-6 | 2 | Activity: *"Bring in a guest speaker (ex. Eldred Allen or Joey Angnatok if available) to talk about their experiences with changing ice conditions and their work to ensure that information is shared with the people who need it most."* (3-6 – Lesson 4 – Exploring Sea Ice: Weather on a Changing Ocean)<br><br>Activity: *"During Spring break up or Fall freeze up go to a high point or good viewing point of the bay in the community. Repeat photography of ice conditions over 2 weeks; on Monday, Wednesday, and Friday take photos from the same vantage point."* (3-6 – Lesson 4 – Exploring Sea Ice: Weather on a Changing Ocean)<br><br>Activity: "*Have students pick a question individually or in small groups, select a tool (or two!) to investigate their question, identify and control any variables in their investigation, and write a plan to attempt to answer their question. Once completed, head to the beach or dock to test their hypotheses."* (3-6 – Lesson 7 – Marine Monitoring) |
| Grade 7 | 2 | Assessment: *"Take the class to the beach to practice what they have learned by completing a blackline master's template."* (7 – Lesson 1 – Marine Ecosystem Interactions) |
| Grade 8 | 1 | PowerPoint and discussion of abiotic features of ecosystems. Activity*: "Head to the beach and have students use tools available in the kit to observe different abiotic elements of* |

| | | |
|---|---|---|
| | | *the sea and see them in action."* (Grade 8 – Lesson 1 - Water Systems: Abiotic Factors in the Labrador Sea) |

### *3.2.5 Overarching priorities*

The main sub-theme contributing to "Overarching priorities" that showed up tangibly in the content of the learning activities was "Multiple ways of knowing". "Multiple ways of knowing" is present in half (10) of the learning activities from K-8 (Table 10). The Putjotik kit blends science and social studies curriculum, as well as positioning Inuit knowledge and science knowledge side by side. For example, in a PowerPoint made for grades 3-6 students are brought through the history of how people have classified different forms of life (Figure 11).

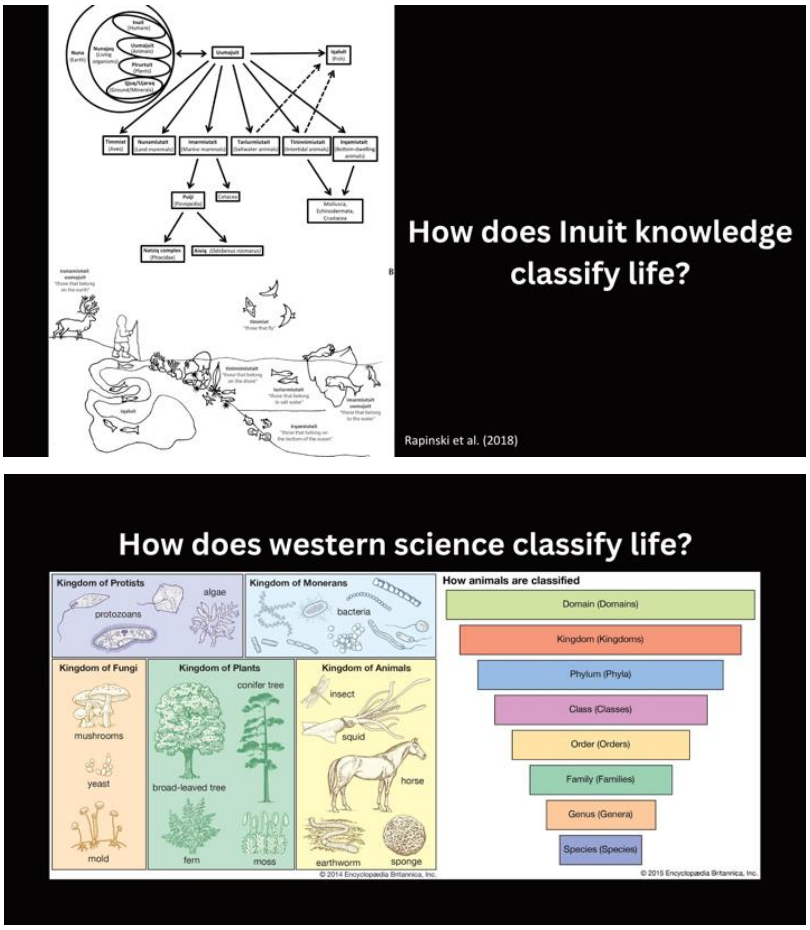



**Figure 11.** Two slides from a slideshow in the Putjotik kit that position Inuit and western classification for life systems next to one another.

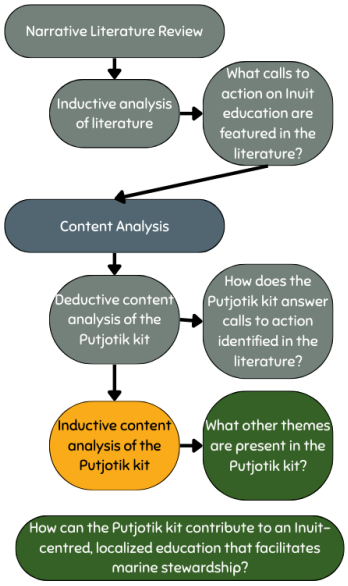
The Putjotik kit also contributes to other sub-themes identified in the literature such as "Investing in early years" by distributing more learning activities and resources for grades k-2 compared to upper grades. Other elements such as "Wellbeing", "Modern education",

"Autonomy and sovereignty" and "Preparing students for all life paths" are present implicitly in the kit and will be reviewed in depth in Chapter 4.

**Table 10.** Examples of the sub-theme "Multiple Ways of Knowing" in the Putjotik kit, organized by grade.

| Grade | # of learning activities | How do learning activities contribute? |
|---|---|---|
| Grades K-2 | 4 | Topic: *"Discuss with the class the barriers to understanding the ocean (large, ice cover, cold, dark, can't breathe underwater, etc.). Discuss how people have come to learn about the ocean (things washing up, fishers catching things, observing on boats or on the shoreline, ROVs, etc.)."* (K-2 – Lesson 4 – Getting to know the Ocean)<br><br>Discussion question: *"What are the ways we can explore the beach? What are different ways we can tell the ocean is healthy and productive or unhealthy? How has technology changed the ways we know the ocean?"* (K-2 – Lesson 4 – Getting to know the Ocean)<br><br>Learning Activity*: "In the middle is the deepest part of the ocean (the abyss), followed by the continental shelf, then the shore. Demarcate with printed out photos of who lives where along the continuum. Name the photos in English and Inuttitut. Split the class in two and play tug of war to see who can drag the other half of the class into the abyss to meet Senda and the snow crabs."* (K-2 – Lesson 2 – Ocean Zones) |
| Grades 3-6 | 5 | PowerPoint includes Scientific Knowledge and Inuit Classification systems for life. Discussion questions: *"What differences or similarities did you notice in each classification system?"* (3-6 – Lesson 5 – Marine Diversity and Evolution) |
| Grade 8 | 1 | Discussion question*: "How are people getting to know the Labrador Sea? Who are partners in this exploration? What are their mandates and projects? Why does it matter?"* (8 – Lesson 2 – Ocean Basin Exploration) |

## 3.3 Inductive Content Analysis: Emergent themes




This section discusses what themes emerged from the Putjotik kit that are outside the scope of deductive analysis on pre-identified themes from literature. Four key themes emerged: "Local content", "Citizens of Nunatsiavut and beyond", "Interconnection", and "Stewardship values and actions". Results from this analysis contribute to answering the research question: *How does the Putjotik/Snow Crab kit contribute to a Nunatsiavut-centred education system?*

### *3.3.1 Local content*

The "Local content" theme included sub-themes "Local ecology and environment" and "Local history and economy". This theme was present in all learning activities (Table 11). Snow crab is a local species and a staple in the commercial fishing economy in Nunatsiavut. The theme has overlap with "Culturally relevant content", however it is specific to facilitating education that connects students to and celebrates local resources, projects, and activities to enhance student engagement in school. For example, in grade 8, learning activities explore how the physical oceanography of the Labrador current and subsequent abundant marine life has impacted how humans (Inuit and European) have been drawn to productive waters in and adjacent to Nunatsiavut for fishing livelihoods. Another example is the learning activity "K-2 – Snow Crab Lifecycle", which takes place on a dock, connecting students directly to fishers and asking them how they prepare the upcoming season. These activities are highly localized.

**Table 11.** Examples of local content in the Putjotik Kit, organized by grade.

| Grade | # of learning activities | Examples in Learning activities |
|---|---|---|
| Grades K-2 | 8 | Discussion question: "*How do people use materials to build boats that float and can withstand the conditions in the Labrador Sea?"* (K-2 – Lesson 5 – Boating in Nunatsiavut) |

| | | |
|---|---|---|
| | | Activity: *"In anticipation of an intertidal exploration day, have students create maps with landmarks, natural and constructed features, bodies of water, hills, etc. of their communities and plot a path down to the beach."* (K-2 – Lesson – Navigating to the Beach) |
| Grades 3-6 | 7 | Activity: *"Decide on 5 questions students would ask a fisher, fisheries manager with NG, Torngat Fisheries Co-op member, scientist, or co-management board member or staff to ask them about their livelihoods. Invite a guest speaker to the class in person or virtually."* (3-6 – Lesson 3 – Economy, Stewardship, and Sustainable Development) |
| Grade 7 | 2 | Activity: *"In this lesson, students will explore how different ocean ecosystems function to understand the roles of producers, consumers (herbivores, omnivores, and carnivores), and decomposers, and the interactions of abiotic and biotic elements in an ecosystem. They will then apply their knowledge at the beach."* (7 – Lesson 1 – Marine Ecosystem Interactions)<br><br>Discussion question: *"What are some abiotic factors in the Labrador Sea?"* (7 – Lesson 1 – Marine Ecosystem Interactions) |
| Grade 8 | 3 | Discussion question: *"What impacts has the Labrador current had on maritime history?"* (8 – Lesson 3 – Ocean Currents and Waters) |

### *3.3.2 Citizens of Nunatsiavut and beyond*

The theme "Citizens of Nunatsiavut and beyond" emerged throughout the Putjotik kit and includes sub-themes "Employment opportunities", "Showcasing local projects", and "Nunatsiavut governance" (Table 12). Considering the Putjotik kit is cross-curricular, social studies curriculum outcomes are the drivers for "Nunatsiavut governance" considering the unique comprehensive land claims agreement and subsequence governance structures, such as co-management. Snow crab is a co-managed species, which brings in entities such as the NG, the TJFB, and the DFO as learning partners. This theme also ties into interconnectedness, as being a citizen of Nunatsiavut and learning about local ocean processes ultimately ties students to the broader world. There are learning activities in which students debate the opportunities and challenges that come with changing ocean landscapes and how to best care for the land from their perspectives, creating a chance for students to explore themselves and their values as active citizens.

**Table 12.** Examples of the theme "Citizens of Nunatsiavut and beyond" in the Putjotik kit, organized by grade.

| Grade | # of learning activities | Examples in Learning activities |
|---|---|---|
| Grades K-2 | 1 | Assessment: "*Take the map home and share it with their families. Their homework is to ask their family members what has changed on their map in their lifetime and why. Students should also brainstorm a change they would like to see on their map and talk about how they could contribute to bringing their vision to life."* (K-2 – Lesson 7 – Navigating to the Beach) |
| Grades 3-6 | 5 | Assessment: *"Assessment 2 embedded in the PowerPoint (end slide): As a class, choose an action to take to make the class's voices known on how the ocean should be used. Assessment 3: Research the effects of deep-sea mining or bottom-contact fishing. Populate a pros and cons chart as a class."* (3-6 – Lesson 2 – Snow Crab Habitat and Adaptations)<br><br>Discussion question: *How do people working in the fishery ensure the snow crab stock remains healthy and productive?* (3-6 – Lesson 3 – Economy, Stewardship, and Sustainable Development) |
| Grade 7 | 1 | Activity: *"In a debrief after speaking to one or two guest speakers, use the following list to generate discussion about what should or should not hypothetically be allowed in a marine protected area in the Labrador Sea and why. Many of these things the answer will likely be "it depends"; talk about under what circumstances or what restrictions students would like to see with these activities."* (7 – Lesson 2 – Marine Environmental Action) |
| Grade 8 | 1 | Topic: *"The Labrador Current and the Gulf Stream are globally significant ocean processes. This lesson plan will explore local climate patterns, as well as the importance of deep-water formation in the North Atlantic for global climate and ocean health."* (8 – Lesson 3 – Ocean Currents and Waters) |

### *3.3.4 Interconnection*

In the Putjotik kit, social studies and science curriculum outcomes are integrated into the same lesson in 12 of 20 (60%) learning activities (Table 13). This breaks down the disciplinary boundaries that are prevalent in Euro-Canadian education pedagogies and that also show up in broader management silos. Fisheries are excellent examples of the interconnectedness of humans and the natural world and can be used as conduits for integrating social studies and science curriculum outcomes. For example, in lesson plan 1 for grades 3-6 titled "Nunatsiavut's Fishing

History" students are asked to discuss the ways in which the local marine environment has shaped ways of life (i.e., economies, transportation, technologies, etc.) (Table 13). In grade 7 students are asked to discuss how people influence the ocean in positive and negative ways. Furthermore, in grade 8, the Labrador current is used to connect students to the wider world through the ocean's role in global climate regulation. Learning activities in the Putjotik kit ask students to consider the connections between disciplines, between other parts of the world that are connected by the ocean, and between themselves and the more-than-human world.

**Table 13.** Examples of "Interconnection" in the Putjotik kit, organized by grade.

| Grade | # of learning activities | Examples in Learning activities |
|---|---|---|
| Grades K-2 | 2 | Topic: *"Discuss how the fishery is an example of a renewable resource industry that needs to be taken care of to make sure there is enough crab for people and for the ecosystem."* (K-2 – Lesson 1 – Introduction)<br><br>Discussion question*: "As seasons change, what kinds of activities could you find snow crabs doing? How about snow crab fishers?"* (K-2 – Lesson 3 – Snow Crab Lifecycle) |
| Grades 3-6 | 4 | Activity: *"Labrador Inuit have been stewarding fisheries resources for generations; discuss with the class the benefits of being on the water to wellbeing and how livelihoods are informed by environments. Discuss forms of transportation and trade of coastal goods between communities and how technologies have changed over time."* (3-6 – Lesson 1 – Nunatsiavut's Fishing History) |
| Grade 7 | 1 | Discussion question: *"How do people influence the oceans natural environment? What are some ways in which people impact ocean health for the better or for the worst?"* (7 – Lesson 2 – Marine Environmental Action) |
| Grade 8 | 1 | Topic: *"The Labrador Current and the Gulf Stream are globally significant ocean processes. This lesson plan will explore local climate patterns, as well as the importance of deep-water formation in the North Atlantic for global climate and ocean health. Additionally, the Labrador current is integral to local climates and ecosystems and supports cold-water marine life. This lesson is designed to be an introduction to ocean circulation and its effects on global climate patterns."* (8 – Lesson 3 – Ocean Currents and Waves) |

### *3.3.5 Stewardship values and action*

Stewardship is an action of cultivating a personal, reciprocal relationship with the land. The theme "Stewardship values and actions" was present in 9 of 20 learning activities (Table 14). This theme directly contributes to the Torngat Secretariat's goals outlined in the Stewardship and Education Strategy (SES) (2021) (Figure 3). Stewardship emerged in part due to the co-management led nature of this project, but also as a reflection of Inuit culture of understanding and respecting the natural world. Furthermore, the snow crab lifecycle is complex and covers multiple habitats, making it an excellent example of a species that requires holistic stewardship. Snow crab are excellent teachers of how one species relies on a complicated and ever-changing landscape to be healthy and productive. This theme overlaps with land-based learning in most cases, as when students go out on the land, they are asked to be respectful and leave it better than when they found it. It is also strongly tied into science curriculum, as when students go to collect information about the ocean or learn at the beach, they are asked how that knowledge can benefit the ecosystem they are investigating. Another example of a learning activity that brings stewardship to the forefront of education is a learning activity on ghost gear and marine waste, which is identified by the SES (2021) as a priority for stewardship action by the TS. In this learning activity, students watch videos on local ghost gear retrieval projects in Atlantic Canada and invite a guest speaker who has been involved in those projects. "Stewardship values and action" is related to other emergent themes "Citizens of Nunatsiavut and the world" and "Interconnection", as well as "Land-based learning", as understanding and exploring students' relationship with the land embodies all these categories.

**Table 14.** Examples of **"**Stewardship values and actions" in the Putjotik kit, organized by grade.

| Grade | # of learning activities | Examples in Learning activities |
|---|---|---|
| Grades K-2 | 2 | Discussion question: *"How can we make sure our visit is beneficial to the beach inhabitants?"* (K-2 – Lesson 8 – Beach Day)<br><br>Activity: *"When it is time to leave, ask each student to pick up a piece of garbage and do a beach sweep to make sure nothing is left behind."* (K-2 – Lesson 8 – Beach Day) |
| Grades 3-6 | 6 | Discussion question: *"What are some threats to habitat loss in the deep ocean? How does habitat loss affect snow crab?"* (3-6 – Lesson 2 – Snow Crab Habitat and Adaptations) |

| | | |
|---|---|---|
| | | Topic: *"Describe how inquiry can be beneficial and/or harmful to organisms - plan to ensure exploration is beneficial to organisms (i.e., make sure the beach is better than what you found it, that the information gathered will be used to improve habitat, etc.). Discuss challenges posed by the environment to monitoring and create a plan as a class to ensure all people and gear are returned safely"* (3-6 – Lesson 7 – Marine Monitoring) |
| Grade 7 | 1 | Topic: *"Labrador Inuit have been active stewards of the Labrador Sea for generations and continue to take care of the ocean today. There are many examples of this such as withholding parts of quotas when there is uncertainty around stocks, the ghost gear retrieval program, and Makkovik's Friends of the Beach group."* (7 – Lesson 2 – Marine Environmental Action)<br><br>Discussion question: *"How do people influence the oceans natural environment? What are some ways in which people impact oceans health for the better or for the worst? How can people be stewards of the sea?"* (7 – Lesson 2 – Marine Environmental Action) |

# Chapter 4 – Discussion

Chapter 4 contains three parts: 1) A discussion of the education system in Nunatsiavut and where the Putjotik kit fits into this context; 2) How the Putjotik kit supports self-determination in governance and stewardship, and 3) Limitations, recommendations, and conclusion.

## 4.1 Formal education in Nunatsiavut and the offerings of the Putjotik kit

### *4.1.2 Interventions in formal K-12 education in Nunatsiavut*

There are tensions between the current Newfoundland and Labrador (NL) provincial school curriculum and a curriculum that is founded in Inuit values, cultural knowledge, and worldview (Moore et al., 2016). To bridge this gap, teachers in Nunatsiavut have been incorporating Inuit cultural components to meet curriculum outcomes individually. The Paigitsiaguk project provides additional place-based, culturally relevant materials, resources, and learning activities to inspire and support teachers in their goals to meet curriculum outcomes while also facilitating environmental stewardship.

There are also several programs are being run by NG and higher education institutions in Labrador to bridge the gap between education currently provided and what the community would like to see in formal education. As discussed in Chapter 1, the Nunatsiavut Government (NG) provides Inuktitut language courses and Inuit culture supplemental programming, as well as funding for post-secondary education. Additionally, through a partnership of Memorial University and the Nunatsiavut Government, the Inuit Batchelor of Education Program (IBED) also prepared one cohort of teachers (2014-2018) for Inuit-centered teaching in Nunatsiavut through the Labrador Institute (which became Memorial University's Labrador Campus in January 2022), based in Happy Valley-Goose Bay. The work of this teacher cohort who took the program is ongoing in Nunatsiavut, and one of the key documents used to identify educational priorities for this paper was written by the participants in the IBED program (Moore et al., 2016). The IBED program was an excellent example of Inuit-centered, decolonized teacher education (Moore & Galway, 2018), and as identified by a case study in Makkovik, teachers who have connection to the community are respected by students and can impact student's interest in school and achievement (Moore et al., 2022). The Labrador Campus also hosts an annual land-

based science camp for youth. The converging interests of supporting teachers, ensuring excellent culturally relevant education, and wellbeing of students in Nunatsiavut has brought together many institutions, including the Torngat Secretariat.

The Torngat Secretariat (TS) is invested in providing additional resources to the formal public education system to promote local Inuit stewardship and wellbeing through education. With the TS's mandate, community connections, understanding of local issues and priorities, and available funding, co-management boards can produce valuable resources for stewardship education to people of all ages. The education kits in the Paigitsiaguk project could be considered boundary work, considering they are collectively made objects created by people with multiple perspectives and backgrounds (Leigh Star, 2010). When considered together, this network of Inuit educators, government employees and support through NG, co-management boards, students, Elders, and knowledge holders are contributing to a Nunatsiavut centered education system within current NL curriculum restraints. The Paigitsiaguk project aims to contribute to this momentum.

### *4.1.2 Contributing to Inuit-centered education*

Education attainment for Inuit in Canada compared to non-Indigenous populations in Canada is stark: in 2016, 86% of non-Indigenous Canadians have a high school diploma compared to 45% of Inuit (Inuit Tapiriit Kanatami, 2018). The differences in education attainment are a direct impact of settler colonialism. Historically, education initiatives have often been imposed upon Indigenous communities through top-down government or religious organizations. Euro-Canadian public education has been and continues to be a tool to culturally assimilate Indigenous youth to European culture and values (Coulthard, 2014; Simpson, 2017) through "cognitive imperialism" (Battiste, 1998). This process has been violent and dispossessed Indigenous peoples of their lands, resources, and connection to communities. Not only have these systems had no connection to Indigenous cultures or educational practices, but they actively worked to dismantle and oppress Indigenous educational systems that are land and community based. This process continues to the present day. Furthermore, the effects of residential schools have caused many Indigenous people in Canada to rightfully distrust the education system. Today, the lack of culturally and locally relevant curriculum does not make the education system an appealing prospect for many youths. In Nunatsiavut, the graduation rate is

quite high at 83% compared to the larger Inuit Nunangat (Lane, 2013), however, at a post-secondary education level a gap remains between Inuit students and the non-Indigenous population (Inuit Tapiriit Kanatami, 2018).

Nonetheless, as acknowledged by many educators, the formal education system does not have to be this way. Since the 1960's, community pressure and organization has led to educational reform in the Eastern Arctic to include land-based and cultural programming (McGregor, 2010). Communities should not have to choose between education that prepares students for further western education at the cost of losing cultural values and skills. There is ample space for both Indigenous and western knowledge systems in formal education, and students can then be equipped to use different knowledge systems and skills in their appropriate contexts (Barnhardt & Kawagley, 2005).

In the documentary, "*Quallunaat! Why White People are Funny*" (Sandiford, 2006), Zebedee Nungak converses with his old schoolteacher about a day where he was physically carried back to school by his teacher after trying to go partridge hunting for the day. This story illustrates the dissonance between Inuit and Euro-Canadian land relationships, as well as differences in education pedagogies.

> *"The current education system, operated by school boards often administered in the south, have resulted in a lack of local Inuit control and a cultural incongruence that does not reflect Inuit culture and values, while also continuing to displace Inuit from the land and the forms of knowledge generated from their lands."* (Obed, 2017, p. 74).

Land-based education has been identified by Nunatsiavut scholars as a tool with which to recenter education from an Inuit lens, as well as a middle ground for knowledge systems to come together (Snow & Obed, 2022; Anderson & Lane, 2020; Moore et al., 2016; Obed, 2017). Land-based learning connects youth to their homelands, and land-based pedagogy can improve physical, mental, emotional, and spiritual wellbeing (Luig, 2011; Snow & Obed, 2022). Land-based competencies are already present in Inuit lives (Anderson & Lane, 2020). Commercial fisheries in Nunatsiavut have allowed fishers to remain in relationship with the land and ocean and continue cultural practices such as intergenerational knowledge transfer, observation of the landscape, harvesting, and stewardship (Cadman et al., 2023). Learning in relationship with the land is especially important in the face of a climate change, where place-based, local knowledge and Indigenous worldviews and knowledge are essential to human and non-human survival

(Arrows, 2019). The Putjotik kit supports land-based learning by outlining learning activities that connect students with local knowledge holders and include land-based excursions in over half of learning activities.

The Paigitsiaguk project can also support decolonizing education in classrooms. As described by Tuck and Yang (2012), the education system has been organized, governed, standardized, and in all ways created by settled colonialism, and unsettling that system must actively and practically decentre settler perspectives and worldviews. “Decolonization is accountable to Indigenous sovereignty and futurity” (Tuck & Yang, 2012, p. 36), meaning that a decolonized education system in this case should contribute to the sovereign future of Nunatsiavut. It could be argued that the Paigitsiaguk project does not support decolonizing education, as it is formed around meeting curriculum outcomes set by the provincial government. However, every practical push towards an education that is created based on community values and culture, Inuit knowledge, and the land is moving the dial away from a settler-centered education. The extensive transformation required to decolonize education and base educational systems in the 21st century learning environment (Munroe et al., 2013) will happen one step at a time.

To illustrate, assessment in the Putjotik kit is consciously and deliberately designed to have students participate in activities by watching or doing, reflect on or further practice their learning, connect with knowledge holders and/or the land, or create products to share with their families or communities. These forms of assessment in both purpose and outcome are very different from standardized testing that has been the basis for assessment in western education, and have frequently found Indigenous youth lacking (Spillman, 2017). The 2018 Inuit Educational Summit (Inuit Circumpolar Council) identified that “building on Inuit educational approaches, pedagogies, and models that successfully integrate the sciences, arts, humanities, and other disciplines into the natural and familiar environments that Inuit children live in” (p. 2) is a priority. The Putjotik kit contributes to these calls to action to provide localized education resources, to action Inuit educational approaches through suggested learning activities, and to bridge disciplinary and knowledge system boundaries by including multiple disciplines in one space. However, it must be underlined that decolonizing classrooms and Indigenizing pedagogy is the work and practice of teachers (Pete et al., 2013). The education kits provide resources and

guides for learning activities, but teachers are the ones using and implementing these kits in ways that they deem most valuable for their classrooms.

Led by the Torngat Secretariat and Inuit educators, the project is a bottom-up initiative that aligns with the values and priorities of communities in Nunatsiavut, in accordance with the goals of the Secretariat's Stewardship and Education Strategy (SES) (Blanchard, 2021). This program is led by local educators and learning activities are customizable to specific communities. In land-based and community-based learning activities, students are connected to their local contexts and build on their knowledge and understanding of the ocean. Many students in Nunatsiavut have an abundance of lived experience with the ocean whether through recreation, fishing, or traveling by boat or skidoo on the sea ice. Communities in Nunatsiavut are situated on the coast and have ample physical access to the intertidal marine environment. The learning activities are built around the pre-existing capacity and resources that communities have; knowledge holders and lands which are powerful conduits for learning.

### *4.1.3 Pedagogy: A note on lesson plans*

At present, learning activities are contained in lesson plan templates; a common medium for teachers to outline their lessons. I think of these lesson plans as recipes. They are provided as guides and jumping off points, however a dish is augmented by the available ingredients, knowledge, purpose, preferences, needs, and experiences of those creating the meal. You might find two or three recipes on your search and combine them, adding and substituting ingredients to suit the needs of your dinner guests. Some ingredients may be found in the pantry, and others may need to be sought out or borrowed from a neighbour. If lesson plans are recipes, learning environments would be kitchens, and a collaborative learning experience would be a potluck. While cooking the dishes, happy messes, collaboration, laughter, and learning ensue. At a potluck, every person comes with something to share, which is a value that underpins many of these learning activities. The real learning happens between students and their communities, facilitated by teachers.

While the activities are formatted as lesson plans, the intention and design of the documents are to be customizable, fluid, and transformative for teachers and students. Lesson plans are typically a tool of transmissive or instrumental modes of teaching, which is a common default teaching method for environmental education (Papenfuss et al., 2019). In order to push

towards decolonizing education, it is important to shift to *transformative* modes of teaching that disrupt the typical colonial business of making and obtaining knowledge in a formal education setting (Fujino et al., 2018). Transformative modes of teaching embrace multiple ways of knowing and expressing knowledge, as well as respectful, mutual learning between all of those involved in activities; this includes knowledge holders, Elders, and teachers of all kinds. The relationship and knowledge transmission between youth and Elders is especially integral for cultural continuity and learning, as well as wellbeing for both parties (Gabel et al., 2016). It is through this logic that the Paigitsiaguk project positions teachers as facilitators who connect youth with their communities and who share in the learning activity ideas through collective and reciprocal learning experiences.

As discussed, the Torngat Secretariat (TS) is not an educational institution, but a wildlife and fisheries management organisation. The TS is contributing to localizing education by creating resources that can be used by teachers in order to meet their curriculum requirements. These resources and learning activities are carefully crafted by the Paigitsiaguk project team and then placed in boxes and in online digital resource repositories for teachers to access. The Putjotik kit will remain inanimate in its box until teachers, youth, Elders, guest speakers, and the land breathe life into them.

### *4.1.4 Ocean literacy*

At its most fundamental definition, ocean literacy is "an understanding the ocean's influence on you and your influence on the ocean." (Cava et al., 2005, p. 5). Today, most ocean literacy programs are built in the south and aimed at an urban student population of youth who might not have very much lived experience with the ocean. In Nunatsiavut, communities and students live next to the sea and depend on it for livelihoods, transportation networks, and recreation. The Putjotik kit uses the ocean and its inhabitants as a medium for youth to express their knowledge and further their understanding of concepts, rather than a typical ocean literacy kit that is focused on delivering information about the ocean. The Putjotik kit seeks to center youth, their knowledge and experience, and their communities, rather than ocean information. For this reason, the Putjotik kit is an Indigenous education project more than an ocean literacy project.

## 4.2 Supporting self-determination and decentralizing marine management, research, and stewardship

The state of fisheries at a global scale have been characterized by overexploitation, destruction of habitat, and lack of regulation and enforcement, which have caused large-scale ecosystem changes (Beddington et al., 2007; Pauley & Maclean, 2003; Pauley et al., 1998). It is clear a change in mindset and management is necessary for commercial fisheries to be sustainable in the long term. Key components of sustainable fisheries management include creating incentives for conservation while respecting and upholding fishers' rights, ecosystem-based management, increased monitoring of stocks, and employing precautions when uncertainty exists (Beddington et al., 2007). The TJFB's efforts to increase scientific monitoring of snow crab since 2012 (Boudreau et al., 2012; Torngat Joint Fisheries Board, 2017), integrate fisher knowledge into snow crab management, and recommend reductions in allocation based on that information (Torngat Joint Fisheries Board, 2013) demonstrates that the TJFB is invested in the long-term sustainability and stewardship of fisheries resources. The TJFB has worked with NG to withhold both their 100 metric tonne exploratory quota and 15% of their overall allocation for six years after their continuous recommendations to reduce quota were not granted by the DFO (Snook, 2023). Furthermore, the TJFB has obtained additional funding to contract vessels to clean up ghost gear from local waters. These activities, along with the Paigitsiaguk project, illustrate a strong ethic of stewardship at multiple scales.

Co-management boards are typically involved in fisheries and wildlife research, making recommendations, and setting total allowable harvest rates for species. The Torngat Secretariat directs those kinds of research activities and has been successful in localizing the benefits of research, integrating local and Inuit knowledge into management, and increasing the opportunities and benefits of wildlife and fisheries harvesting for Nunatsiavut beneficiaries. However, concerns have been raised locally about the treatment of harvested species from a traditional values perspective (Blanchard, 2021), which indicates that there is at times a missing link in intergenerational knowledge transfer. The Paigitsiaguk project is an intervention that seeks to use the public school system to bridge knowledge holders and youth. Six learning activities ("K-2 – Introduction"; "K-2 – Navigating to the beach"; "K-2 – Beach Day"; "3-6 – Exploring the Sea Ice"; "3-6 – Ghost Gear"; "7 – Marine Environmental Action") in the Putjotik kit suggest activities where guest speakers such as Elders or local knowledge holders are invited

to the classroom. Another six learning activities ("K-2 – Introduction to Snow Crab Fishing"; "K-2 – Snow Crab Lifecycle"; "3-6 – Economies, Stewardship, and Sustainable Development"; "3-6 – Marine Monitoring"; "3-6 – Nunatsiavut's Fishing History"; "8 – Ocean Basin Exploration") request a guest speaker from the fisheries industry (i.e., in processing, fishing, management, science, etc.) be involved as a key part of the learning activity. Through this education kit, curriculum outcomes can be met while highlighting local knowledge and projects and celebrating the longstanding relationship between Nunatsiavummuit and their lands.

Knowledge does not always lead to action, however place-based attachment can lead to environmental action (Devine-Wright, 2009). Furthermore, place-based education can foster student's appreciation for the natural world and create ties to the community that can inspire citizenship-based action (Sobel, 2004). Fostering connection to place through marine stewardship education can also lead to decentralized marine governance, as it is people are who are interacting with and harvesting resources. In Nunatsiavut where beneficiaries have constitutionally protected rights to harvest fish and marine species within the bounds of co-management and the continued ubiquity and importance of subsistence harvest of coastal and marine species (Felt et al., 2012), it is integral that everyone receives culturally informed marine stewardship education that is based on relationship to place. Communities are also more likely to support sustainable practices when they are connected to and dependant on coastal areas as their resources (Bennett et al., 2018). The formal education system is an opportune place to promote access and connection to the sea considering the mandatory nature of school and the value of providing familiar, culturally relevant, community-based, and land-based resources, which are contextualized to local governance processes.

In the Putjotik kit, there are four learning activities ("3-6 – Exploring the Sea Ice"; "3-6 – Marine Monitoring"; "7- Marine Ecosystem Interactions"; "8 – Water Systems and Abiotic Factors") that bring students on the land to gather scientific information with available tools. The Putjotik kit contains tools such as a quadrant, a go-pro, magnifying glasses, clip boards, viewing buckets, measuring tapes, PH monitors, a water clarity disc, and temperature gauges. These activities allow students to become familiar with scientific tools for exploring their local ecosystems and gain scientific skills. It also provides the opportunity for students to talk to people involved in local projects, knowledge holders, fishers, and scientists, which are all potential career streams. There are also three learning activities ("K-2 – Navigating to the

Beach", "3-6 Snow Crab Habitat", on in "7 – Marine Environmental Action") that include imagining potential future scenarios, projects, or industries in Nunatsiavut and allow students to visualize what they would like to see in their communities. These activities all have the potential to equip students with science skills and inspire students to get involved with and pursue local research and stewardship activities. Building social capacity in science skills and providing opportunities for students to reflect on their aspirations for the future can help promote self-determined research in the region.

### *4.2.1 Marine-based education resources: Contributions to wellbeing*

Natural resource management decisions and actions on all scales have direct impacts of human wellbeing (Breslow et al., 2016; Weeratunge et al., 2014). Co-management boards have the opportunity to prioritize and enhance the health and wellbeing of Indigenous communities through their decision making and activities (Snook, 2021). In the case of the Paigitsiaguk project, the TWPFS is contributing to the public education system by providing stewardship resources. The Putjotik kit can empower environmental education through stewardship activities as well as facilitate integrational ties to culture and place between knowledge holders and students that contribute to the wellbeing of students and their wider communities. As discussed, in the Putjotik kit there are resources, tools, and guides for teachers to use that increase access to marine-based information, connection and access to local nature and culture, and have the opportunity to inspire future employment, research, and stewardship activities. Social determinants of health such as access to environmental education, access to nature and the land, and connecting students to their communities (Breslow et al., 2016) can all contribute to student's mental, physical, emotional, and spiritual wellbeing. Place-based education in Nunatsiavut is also a matter of physical safety in a harsh and quickly changing climate (Mercer, 2018; Meredith et al., 2019); travel by sea ice on skidoo is a common winter mode of transportation between coastal communities. In one learning activity (3-6 – Exploring the Sea Ice), students reflect on their experiences with a changing climate, speak with local knowledge holders, and observe the sea ice over a period of weeks. Integrating these kinds of learning activities to meet provincial curriculum requirement to learn about weather patterns and climate change will ground learning and make it a practical endeavour that will aid students in safe navigation and adaptating to changing circumstances.

There are six learning activities in the Putjotik kit that invite local professionals and employers into the classroom. Collaboration between educators and local experts can foster interest in students to pursue local work and professional opportunities within the area. In the long term, this may encourage youth to remain in community or come back to work in the region and build additional local capacity. Likewise, at a fundamental level, northern shrimp and snow crab are occasionally available through the NG's community freezer program (Cadman et al., 2023). On average, 59% of households in Nunatsiavut are food insecure, a percentage that is much higher than the national and provincial rates (McTavish et al., 2017). Ensuring the continued viability and sustainable harvest of snow crab and other marine species directly impacts local food security and sovereignty.

### *4.2.2 Multiple ways of knowing*

In the Putjotik kit, activities are informed by Elders, knowledge holders, fishers, scientists, marine managers, and student inquiry and observation. Learning activities span curriculum requirements from science and social studies, breaking down knowledge silos. Inuit and scientific knowledge are held up as their own whole and complete knowledge systems (Reid et al., 2021), as well as discussed in relation to one another. Inuit and scientific knowledge do not need to be at odds with one another but can contribute in parallel by drawing from their proper strengths to bolster the ways in which people understand the health and abundance of species.

Fisheries are complicated socio-economic systems that benefit from integrating multiple forms of knowledge (Cash et al., 2003; Paul, 2019). There have been calls to restructure fisheries management to incorporate local knowledge and to address the colonial nature of centralized control over fisheries and fisheries science knowledge (Silver, et al., 2022). Additionally, the scientific community has begun to dialogue about reimagining sustainable fisheries management to transform fish from "commodities to cohabitants" (Jacquet & Pauly, 2022). The ocean is an extremely complex ecosystem, and its inhabitants are poorly understood in relation to their terrestrial counterparts.

The Putjotik kit aims to facilitate a connection between school-aged youth and a cold-water loving, deep-sea dwelling crustacean that supports a sizable portion of the local economy. Connecting people to fish, fishers, and the places these systems interact with one another is a way to begin reimagining relationships between humans and the more-than-human world (Silver

et al., 2022). Co-management arrangements are positioned to be excellent bridges between knowledge systems given their community networks and mandates (Snook et al., 2018). Although not an education institution, the Torngat Secretariat has leveraged its unique position, community connections, knowledge gathering and integration frameworks, funding, and mandate to create transdisciplinary educational resources that celebrate multiple ways of knowing.

## 4.3 Limitations

If given more time to work on this project, I would have created additional learning activities and resources. As identified by the educational experts on the Paigitsiaguk project team, there was only time to go through the science and social studies curriculum. There are opportunities for these kits to expand into other curriculum subject areas, such as math or language arts. Furthermore, as identified in Chapter 3, incorporating Inuktitut language components into the Putjotik kit at higher grade levels and more comprehensively is a place in need of additional time and energy. Language revitalization is a priority of the Nunatsiavut Government given the resources allocated to language classes, as well as seen across the literature. Additionally, there is room for growth as more species could be identified as conduits for learning. It would be preferable to have a minimum of 5 kits so each school in Nunatsiavut could benefit from having one at a time.

Considering the short nature of a master's program, I am completing this analysis on learning activities and resources in the Pujotik kit created and compiled for grades K-8. High school level activities will be part of the Putjotik kit, however due to time constraints and the concurrent nature of the work, they are not analyzed in the scope of this paper. I was also unable to receive teacher feedback and validation on learning activities and resources by the time this paper is to be submitted. However, since the Paigitsiaguk Project is ongoing under the Torngat Secretariat, the co-management partner project team will complete this section of the work. Workshops are planned in each community in Nunatsiavut where teachers will complete a review of each kit and give their feedback on the utility and content of the learning activities and resources. Two long-time educators on the Paigitsiaguk project team with a wealth of experience in both academia and classrooms will facilitate these workshops.

There are also conditions that are outside of the control of the Torngat Secretariat that could limit the potential of the Putjotik kit. The Torngat Secretariat cannot directly implement the

education kits; the kits can only be provided to interested schools and teachers. At present, the number of current and past teachers on the Paigitsiaguk project team will likely make this integration process easier, however there must be links between TS staff and school administrators and teachers in order to make the leap between the co-management institution and the formal education system. Furthermore, this work will need to be continuously updated and renewed as circumstances change over time. For example, the Nunatsiavut-adjacent snow crab stock is in long-term decline; this could impact the relevance and applicability of the kit to students. Perhaps cod will return as a valuable and ubiquitous fishery, or emerging fisheries such as sea cucumbers will become keystones of the coast. Fisheries are in constant flux due to their ecological and social complexities and the Paigitsiaguk project will need to adapt alongside these changes in wildlife and fisheries. While many activities in the Putjotik kit are built around guest speakers who will have current information, there are also PowerPoint presentations and posters with information that will need to be updated over time. Ensuring ongoing relationships with educators and adequate capacity for the Paigitsiaguk project to remain current will be critical in keeping all education kits relevant and useful.

I was able to obtain feedback from the co-management boards themselves through an overview presentation of the work in fall 2023; this feedback will be incorporated into high school level learning activities. The Paigitsiaguk project team has also procured additional funding to complete interviews with youth who have participated in the Torngat Secretariat's stewardship and education initiatives. This exploratory evaluation process will take place in the coming years. Although this paper is reflective of snapshot in time when the Putjotik kit is not fully complete and has not been reviewed by teachers in Nunatsiavut, I am encouraged that this project is only at its beginning stages and look forward to feedback and future directions.

## 4.4 Recommendations

The following recommendations are reflections on potential next steps for the Paigitsiaguk project, as well as identifying opportunities for other organizations interested in localizing marine stewardship education. Internal recommendations include:

1. One of the current strengths of the Paigitsiaguk project is the capacity of the team. The educational experts on staff are excellent guides and producers of the education kits and much has been accomplished in a year. This is due to the team's expertise, collaboration,

and network. Furthermore, having a respected Inuttitut translator available to translate learning activities and resources is extremely valuable. It is recommended that the Paigitsiaguk project lead position is retained in the long term in order to guide the work, keep education resources up to date, and to keep relationships intact with teachers who are interested in implementing the education kits.

2. Furthermore, in order to keep education resources current and useful for classrooms, it is recommended that ongoing funding is allocated for both salary for a permanent project lead and goods and services to purchase new resources. Education is a constantly evolving field, and with resources that rely on current local contexts it is essential to have a sustainable budget model to match.
3. As discussed in limitations, there are additional opportunities to increase marine education resources based on local culture and ecology. Currently there are large maps of Nunatsiavut and circumpolar regions in development, but there are also possibilities for podcasts, interviews, books, language resources, and other audio-visual content made in Nunatsiavut that could be used in classrooms. These resources could be especially helpful for communities outside of Makkovik that do not have a crab processing facility. For example, the Torngat Secretariat could partner with snow crab fishers or the annual snow crab monitoring vessel to complete short documentary-style videos. There are opportunities for other graduate students to contribute to this work. Alternatively, some content could also be created by students as part of their learning; an example learning activity could include writing and illustrating books on their learning about snow crab and their ocean habitat in English and/or Inuttitut that would be available in the kit for the next school to learn from.
4. There is a clear need in the Putjotik kit for more Inuktitut resources given the importance of language revitalization. In the Putjotik kit, the main uses of Inuttitut are vocabulary lists of different ocean animals and worksheets. Expanding Inuktitut resources of all kinds and through a more integrated approach to language acquisition by incorporating Inuttitut into resources ubiquitously would help achieve this goal. This could be accomplished through more in-depth discussions with the translator about what kinds of Inuttitut resources exist currently (ex. songs and stories about the ocean or Sedna,

common marine-related phrases, etc.) and what could be meaningfully incorporated into learning activities.

External recommendations:

5. There is opportunity to share this work to a wider audience. One way to go about this would be to create a web-based open access repository to house the digital resources and learning activities. These kits are localized and Inuit-centered, but there are many opportunities to share this learning with other Inuit and non-Inuit communities, especially in NL where the curriculum aligns with the learning activities. Education often flows from south to north as illustrated in the curriculum requirements of the province. It would be beneficial for all Canadians for that flow of information and education to become more balanced.
6. There is opportunity for wildlife and fisheries management institutions to take inspiration from this work and invest in youth stewardship education. It is recommended that organizations collaborate directly with educators, education authorities, and local communities to make meaningful and practical contributions to the formal education system and create resources which connect students to place through their communities and local ecologies. Investing in youth education is a practical step forwards for wildlife and fisheries organizations to implement a health in all policies (HiAP) approach to their work, as well as invest in the future of sustainable management.

## 4.5 Conclusion

As seen in the in Putjotik kit, co-management boards can play a multitude of roles in furthering self-determination and sovereignty over wildlife and fisheries and support the well-being of communities through work in stewardship education. The Torngat Secretariat is well positioned to collaborate across knowledge systems and to spot synergies between organizations and people that have different interests but can come to work on a common solution. This work is only in its inception; however, the opportunities for the kits to facilitate place-based learning through community- and land-based connections and culturally relevant educational resources are clear. Hopefully this case study will inspire further work on localized marine stewardship education to increase the wellbeing of students and their human and more-than-human

communities. It is now more than ever critical that people and communities are connected to their coastal environments to forward sustainable management and use of the ocean.

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# Appendices

## Appendix A1: Literature Codebook

# Themes/Calls to Action from Literature

Codes

| Name | Description | Files |
|---|---|---|
| **Community-based learning** | Connecting students to their communities. Bringing in and respecting the knowledge and contributions of Elders, knowledge holders, and other community members. Education should reflect the culture and values of how communities would like to see their youth learning/experiencing in public/formal education. | 7 |
| Elders | Elders as keepers of cultural knowledge and as key participants in the education system. | 6 |
| Local Knowledge | Include local knowledge holders in learning activities. Celebrate and include local projects and information. Ground knowledge in local application. | 6 |
| Parents and Guardians | Support from home to transform our education systems. Include parents, guardians, and family members in activities and create relationships with school. | 5 |
| Student-centered | Students are competent explorers. Starting from a place that assumes students have valuable knowledge and experience to share, and that students can be teachers. | 6 |
| **Culturally relevant content** | Learning resources, materials, and content that are relevant to Inuit culture, history, and worldview. | 8 |
| Assessment | Assessment should be culturally relevant and appropriate and take into count the needs of students. Assessment as a powerful tool for standardization. | 4 |
| Decolonizing & Indigenizing Education | Shared space, making space for Indigeneity in colonial education system. Education ideally built on Indigenous worldview from the bottom up. | 3 |
| Embodied | Hands-on learning, active learning. Knowledge is transmitted through embodied activities such as going out on the land to practice a skill or learning language while engaging with the subject matter. | 3 |

| Name | Description | Files |
|---|---|---|
| Familiar | Content, resources, etc. should be familiar to students so they can connect with the materials and best showcase and deepen their knowledge. | 3 |
| **Overarching Priorities** | | |
| Autonomy and Sovereignty | Education should reflect and support Inuit autonomy and sovereignty. | 5 |
| Early-childhood | Investments made in early-childhood education from pre-school to the age of 8. | 2 |
| Global Citizens | Education reflects how students are global citizens and have integral perspectives on a changing Arctic. | 5 |
| Modern Education | Education fit for the 21st century: adaptive, competency-based, and includes global forces as well as local ones. Supports living well today and into the future. | 6 |
| Multiple knowledge systems | Incorporating Inuit and western scientific knowledge systems as whole entities standing alone, but also seeing the benefits of blending when appropriate. Students experience how different knowledge systems may be useful in different situations. | 5 |
| Prepare for Post-secondary | There is an educational attainment gap between Inuit and non-Inuit Canadians at post-secondary educational attainment level. The education system should prepare students for post-secondary. | 7 |
| Right to self-determined education | Right to establish and control their education systems and institutions. Provide education in their own languages, in a manner appropriate to their cultural methods of teaching and learning. | 8 |
| Supporting students to stay in school | Using a variety of mechanisms to ensure school is useful and valuable to students and that students receive the adequate support (in school and at home) to graduate high school. | 4 |
| Well-being | Education as a system to support identity and skill development. Ensure the physical, mental, emotional, and spiritual well-being of students. | 3 |
| **Inuit Values** | As identified by Elders in Inuit Tapiriit Kanatami National Strategy on Inuit Education (2011), education includes, but is ideally built on, Inuit laws and values. | 6 |
| **Inuktitut Language** | Language as essential to the transmission of culture. Education should include Inuktitut language components | 8 |

| Name | Description | Files |
|---|---|---|
| | and is ideally bilingual, with Inuktitut integrated into all subjects. The local dialect in Nunatsiavut is Inuttitut. | |
| **Land-based Learning** | “Learning that supports the development of cultural competencies, language, and skills in relation to traditional learning underpinned by the cultural values of relationship-building with the land” (Snow & Obed, 2022) | 5 |
| Environmental Stewardship | Positive, reciprocal relationships with the environment as a keystone of Inuit culture. Having respect for living things and ensuring conservation for future generations. | 4 |
| Life skills | Skills obtained on the land are key for living well in Nunatsiavut. Examples: navigation, economic and subsistence practices such as hunting, safety practices, survival skills, identification, etc. | 3 |
| Relational Learning | Learning in relationship with the land, and with knowledge holders. | 3 |

## Appendix A2: Putjotik kit Codebook

# Themes in the Putjotik kit

Codes

| Name | Description | Files |
|---|---|---|
| **Citizens of Nunatsiavut and beyond** | Opportunities for students to explore their place in the world through their Nunatsiavut citizenship. Exploring how they can contribute to their communities, envision a future they would like to see, and how they are connected to the broader world through the ocean, climatic, economic, and social forces. | 10 |
| Employment opportunities | Opportunities for students to learn more about local employment opportunities in the marine field. | 5 |
| Nunatsiavut governance | Learning resources and activities that are based in the unique governance structures of Nunatsiavut. | 4 |
| Showcase local projects | Opportunities for students to learn from local projects and work. Inviting guest speakers from local organizations involved in the work. | 9 |
| **Community-based learning** | Elders, Local knowledge, parents and guardians, student-centered, values of communities | 12 |
| Parents and Guardians | Bringing parents and guardians to the classroom. Having parents and guardians contribute to learning at home (ex. Via homework assignments). | 4 |
| Sharing their work with the wider community | Opportunities to share their work - art projects, research, etc. with families and wider communities. | 2 |
| **Culturally relevant content** | Learning resources, materials, and content that are relevant to Inuit culture, history, and worldview. Familiar content, resource, materials, and assessment. Embodied/hands-on learning activities. Decolonize/Indigenize education content. | 14 |
| Culturally relevant assessment | Assessment should be culturally relevant and appropriate and take into count the needs of students. Assessment as a powerful tool for standardization. | 15 |
| Embodied learning | Hands-on learning, active learning. Knowledge is transmitted through embodied activities such as going out on the land to practice a skill or learning language while engaging with the subject matter. | 10 |
| Physical tools for exploration | Science tools that help students explore their surrounding ecosystems. | 7 |

| Name | Description | Files |
|---|---|---|
| Inuit knowledge | Inclusion of Inuit knowledge in learning activity. | 7 |
| Local knowledge holder | A local knowledge holder is brought into the classroom environment (either at school, out in the community, or on the land). | 11 |
| Mutual learning through sharing | Class shares knowledge with one another. Takes the forms of sharing circles, class discussions, and peer-to-peer learning. | 18 |
| Student-centered | Students are competent explorers. Starting from a place that assumes students have valuable knowledge and experience to share, and that students can be teachers. | 16 |
| Self-led discovery time | Time for students to explore on their own either in class, in community, or on the land. Centers students as competent explorers and allows students to explore their own interests in their own way. | 8 |
| Traditional Game | Games played by Labrador Inuit as described by Hutchings (2014). | 2 |
| **Interconnectedness** | A local and global perspective that students are connected by the ocean to other places. | 7 |
| Curriculum Integration | Social studies and science taught in the same learning activity. Curriculum outcomes are integrated. | 12 |
| Interconnected - people and planet | Opportunities for students to explore the ways in which people interact with the environment and how the environment shapes culture and people's relationship with the natural world. | 9 |
| **Inuktitut Language** | Language as essential to the transmission of culture. Education should include Inuktitut language components and is ideally bilingual, with Inuktitut integrated into all subjects. The local dialect in Nunatsiavut is Inuttitut. This code is attached to Inuttitut resources. | 9 |
| **Land-based Learning** | Environmental Stewardship activities and values - learning in relationship with the land. Life skills/land-based skills. Respect for all living things. | 13 |
| Life skills for land-based learning | Skills obtained on the land are key for living well in Nunatsiavut. Examples: navigation, economic and subsistence practices such as hunting, safety practices, survival skills, identification, etc. | 4 |
| Prepare to go on the land | Activities that prepare students to go out onto the land for activities and learning. | 5 |

| Name | Description | Files |
|---|---|---|
| **Local Content** | Content of learning activities are based in students' communities. For example, learning is facilitated through local histories, economies, culture, and ecologies to meet curriculum outcomes. | |
| Local content - environment | Resources (digital and physical) and learning based in local plants, animals, climate, environment, and all other natural processes. | 20 |
| Local history and economy | Resources and learning based in local histories, society, culture, and economies. | 15 |
| **Overarching Priorities** | Autonomy/sovereignty in education. Early childhood. Modern education. Multiple ways of knowing. Prepare for post-secondary. Supporting students to stay in School. Well-being. | |
| Multiple ways of knowing | Incorporating Inuit and western scientific knowledge systems as whole entities standing alone, but also seeing the benefits of blending when appropriate. Students experience how different knowledge systems may be useful in different situations. How to do obtain knowledge? How do we explore the world? Why? | 10 |
| History of Knowledge | Discussion of how knowledge is obtained and transmitted. | 1 |
| Well-being | Topic of wellbeing in the classroom. | 1 |
| **Stewardship values and actions** | Stewardship is an action of cultivating a personal reciprocal relationship with the land. Opportunities for students to contribute to stewarding the lands and waters in their communities. | 11 |

## Appendix B: List of 20 learning activities by grade

| Grade(s) | Title |
|---|---|
| K-2 | Lesson 1 – Introduction |
| K-2 | Lesson 2 – Ocean Zones |
| K-2 | Lesson 3 – Snow Crab Lifecycle |
| K-2 | Lesson 4 – Getting to know the Ocean |
| K-2 | Lesson 5 – Boating in Nunatsiavut |
| K-2 | Lesson 6 – Intro to Snow Crab Fishing |
| K-2 | Lesson 7 – Navigating to the beach |
| K-2 | Lesson 8 - Beach Day |
| 3-6 | Lesson 1 – Nunatsiavut's Fishing History |
| 3-6 | Lesson 2 – Snow Crab Habitat and Adaptations |
| 3-6 | Lesson 3 – Economy, Stewardship, & Sustainable Development |
| 3-6 | Lesson 4 – Exploring the Sea Ice |
| 3-6 | Lesson 5 – Marine Diversity and Evolution |
| 3-6 | Lesson 6 – Ghost Gear |
| 3-6 | Lesson 7 – Marine Monitoring |
| 7 | Lesson 1 – Marine Ecosystem Interactions |
| 7 | Lesson 2 – Marine Environmental Action |
| 8 | Lesson 1 – Water Systems Abiotic Factors |
| 8 | Lesson 2 – Ocean Basin Exploration |
| 8 | Lesson 3 – Ocean Currents and Waves |

## Appendix C: Learning activity lesson plan example K-2

### Paigitsiaguk - Take Care of It
### Learning Activity -

**Visit Torngat Secretariat**

**Grade level:** k-2 **Subjects:** Science **Duration:** 1 hour

**Background:**
Snow crab (Putjotik in Inuktitut; scientific classification, *chionoecetes opilio*) is a cold-water crustacean who lives on the ocean floors of the Northwest Atlantic and North Pacific at depths of 50-2000 meters below sea level. This kit is designed around snow crab to give students an understanding of the species, it's habitat, history of the fishery, and the interconnectedness of ocean ecosystems. This first lesson is an introduction to the sea designed to establish what students know already and to get students thinking about their connection to the ocean.

**Guiding Question(s):**

What do you know about the ocean?
How do you spend time on or nearby the ocean?
Who lives in the ocean?
What is the ocean next to us called? What is special about living next to this ocean? How does this ocean change throughout the year?
What questions do you have about the ocean? What would you like to learn?

**Learning Activity:**

Invite an Elder or community member into the classroom to discuss the unique relationship Inuit have with the ocean.

Gather in a circle to share what the class already knows about the ocean and what they would like to learn using a KWL chart. Share a poster with sea creatures and plants on it, asking students to identify each in both English and Inuktitut vocabulary.

Discuss what is means to students to live next to the Labrador Sea and how the ocean is used

in their lives (ex. Fishing, travel on sea ice or by boat, seal hunting, swimming, etc.).

**Evaluation:**

Students draw or sculpt their favourite animal/plant who lives in the ocean or their favourite activity to do on, by, or in the ocean. All share why they chose this animal/plant/activity and one question they have about their ocean animal/plant/activity.

**Resources/Materials**

- Poster with sea creatures and plants titled "Identify Ocean Inhabitants"
- Crochet crabs, starfish, shrimp, and jellyfish.
- Paper, pencils, crayons, markers, and/or molding clay

**NLESD Curriculum Connections:**

**Kindergarten – Science**

GCO1 – 1.0 demonstrate curiosity and wonder. 8.0 Develop vocabulary and use language to bring meaning to observations. 11.0 explore and select different ways to represent ideas, actions, and experiences and to communicate with others.

GCO2 – 7.0 make observations. 3.0 pose questions that lead to exploration and investigation. 12.0 communicate while exploring and investigating.

**Kindergarten – Social Studies**

K.1.1 Students will be expected to demonstrate an understanding of themselves as unique and special.

- identify characteristics about themselves that make them unique

and special persons; develop an awareness that all individuals have characteristics that make them unique and special; identify characteristics about themselves that make them unique and special persons; develop an awareness that all individuals have characteristics that make them unique and special.

K.1.3 Students will be expected to identify and describe groups to which they belong

- identify the attributes of a family group (local, national, and global); develop an awareness that groups form for a variety of reasons and have a variety of purposes; identify positive and negative feelings associated with belonging or wanting to belong to a group.

**Grade 1 – Science (Unit 1)**

GCO 3 (Knowledge): Students will construct knowledge and understandings of concepts in life science, physical science, and Earth and space science, and apply these understandings to interpret, integrate, and extend their knowledge.

4.0 explore and investigate changes in heat and light from the sun

6.0 devise ways to measure and record daily and seasonal environmental changes

11.0 explore how changes in sunlight affect living things

12.0 investigate daily changes in the characteristics, behaviors, and location of living things

14.0 investigate seasonal changes in the characteristics, behaviors, and location of living things

15.0 investigate human preparations for seasonal changes

**Grade 1 – Social Studies (Unit 1)**

Unit 1: Groups

1.1.1 Students will be expected to demonstrate an understanding of the importance of interactions between people.

- give examples of interactions between people
- recognize reasons why interactions are an important part of our daily life
- demonstrate an understanding that interactions depend on communication

1.1.2 Students will be expected to demonstrate an understanding of the similarity and diversity of social and cultural groups.

- demonstrate an understanding that people join together to form social and cultural groups
- demonstrate an understanding that within each group there are certain characteristics that bring people (local, national, and global) together
- recognize that children (local, national, and global) form a group

Unit 2: Environments

1.2.2 Students will be expected to describe how people depend upon and interact with different natural environments.

- give examples of how climate and weather influence human activities (local, national, and global)
- give examples of how natural environments influence human activities (local, national, and global)
- recognize that our way of life and our environment are affected by the presence and the use of natural resources

**Grade 2 – Science (Unit 4)**

2.4.1 Students will be expected to explain how and why physical environments change over time.

Students will be expected to:

- identify some causes of change in their environment that occur naturally
- recognize that people modify and change their environment according to their needs and wants

47.0 compare human growth and development to that of other animals [GCO 1/3]

48.0 examine the implications of food choices and eating habitats on human growth and development [GCO 1/3]

49.0 examine the implications of actions and decisions that support a healthy lifestyle [GCO 1/3]

**Blackline Masters:**

## Appendix D: Learning activity lesson plan example 3-6

### Paigitsiaguk - Take Care of It
### Learning Activity -

**Visit Torngat Secretariat**

**Grade level:** 3-6 **Subjects:** Science and Social Studies **Duration:** 1.5 hours

**Background:**

Snow crabs (Putjotik in Inuktitut; scientific classification, *chionoecetes opilio*) are highly evolved to thrive in deep sea habitat. These crabs live in one of the most extreme environments on the earth. This lesson plan is designed to introduce the class to deep sea habitats in Labrador, talk about the adaptations creatures need to survive there, and then finally discuss some threats to deep sea habitat.

**Guiding Question(s):**

Who lives in the Labrador Sea?
What is the food web like in the ocean?
What are some challenges of living in the deep sea? How have animals adapted to these challenges? What is a structural/physical adaptation and a behavioral adaptation?
What are some threats to habitat loss in the deep sea? How are animals affected by habitat loss?
What are some actions the class could take to protect snow crab habitat?

**Learning Activity:** Snow crab Habitat and Adaptations

View PowerPoint presentation on Snow crab deep sea habitat and their adaptations. This presentation has lots of questions for class discussion embedded and is meant as a guide. Notes on discussion can be taken in a mind-map form on the board. There are also two more hands-on activities embedded in the presentation.

**Evaluation:**

Options:

- Assessment 1 embedded in the PowerPoint (Slide 4): As a class, tape an ocean animal or plant to everyone's fronts. Pass around a ball of yarn from one classmate to another stating how they relate to one another (ex. I eat you, you eat me, I hide in you, I eat you when you're young, etc.).
- Assessment 2 embedded in the PowerPoint (end slide): As a class, choose an action to take to make the class's voices known on how the ocean should be used.
- Assessment 3: Research the effects of deep-sea mining or bottom-contact fishing. Populate a pros and cons chart as a class.

**Resources/Materials**

- Smartboard or presentation technology
- PowerPoint: Snow Crab Habitat and Adaptations
- Optional primer video: Benthic babies in the deep see - examples of adaptations: https://www.youtube.com/watch?v=Q94zbh1g1No
- Deep Sea creatures footage (embedded in PowerPoint as well):
  https://www.youtube.com/watch?v=uvSNgwIqvrM&ab_channel=EVNautilus
  https://www.youtube.com/watch?v=pxuBwfNp2wk&ab_channel=EVNautilus
  https://www.youtube.com/watch?v=9D0eyI7-XQA&ab_channel=EVNautilus
  https://www.youtube.com/watch?v=8KZsrDGLUJQ&ab_channel=EVNautilus
  https://www.youtube.com/watch?v=lEhYJEQmExE&ab_channel=EVNautilus
- Habitat destruction by trawling YouTube video (optional):
  https://www.youtube.com/watch?v=WxjqlmdaTsM

**NLESD Curriculum Connections:**

**Grade 3 – Social Studies**

Unit 3: Exploring Our World

SCO 7.0 The student will be expected to demonstrate an understanding of the relationship between humans and the physical environment

7.1 Describe the benefits the physical environment offers humans

7.2 Describe the challenges posed by the physical environment

2.4.2 Students will be expected to describe how people's interactions with their environment have changed over time.

Students will be expected to

• describe how their local environment has changed over time as people's needs and wants have changed

• identify the effects of community growth and development on the local environment

**Grade 4 - Science**
Unit 4 - Habitats and communities
63.0 identify a variety of local and regional habitats and their associated populations of plants and animals [GCO 3]
64.0 investigate and describe how a variety of local animals are able to meet their basic needs in their habitat [GCO 3]
65.0 identify examples of scientific knowledge that have developed from a variety of sources [GCO 1]
67.0 compare the structural and behavioral adaptations of animals that help them survive in different kinds of places [GCO 3]
68.0 classify organisms according to their role in a food chain [GCO 3]
15.0 classify according to several attributes and create a chart or diagram that shows the method of classifying [GCO 2]
69.0 predict how reduction or removal of a plant or animal population affects the rest of the community [GCO 3]
70.0 relate habitat loss to the endangerment or extinction of plants and animals [GCO 3]
37.0 contemplate their own and their family's impact on natural resources [GCO 1]

(eg: Climate change is currently the most significant cause of habitat change and loss; directly affecting the ability of organisms to meet their needs. Consequently, climate change is the focus of most current, habitat-related scientific research.)

38.0 describe how personal actions help conserve natural resources and care for living things and their habitats [GCO 1]

How Can We Take Action on Climate Change?

Connection Teachers may
• Invite local conservation organizations to make presentations about how we can help conserve natural resources and care for living things and their habitats.

Students may:
• Research the causes of climate change and local consequences.
• Search online for recent climate change-related news items. Create a bulletin board of climate change headlines.

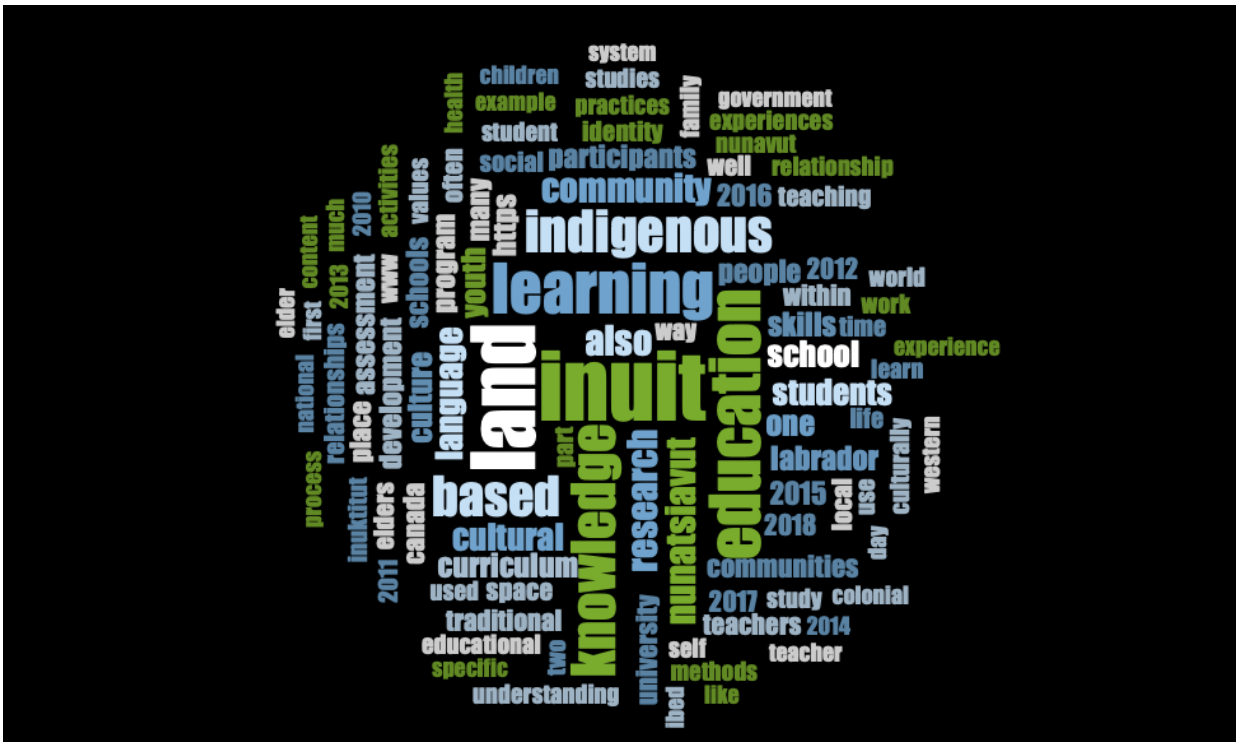
• Create a list of actions they can undertake to reduce the causes and effects of climate change.
• Create a pamphlet on the causes and local consequences of climate change and actions we can undertake to reduce the causes and consequences.
• Select an idea to help a habitat and create a plan to carry it out.

**Grade 5 - Social Studies**
Unit Two: Environment How are societies influenced by the environment?
2.0 - Students are expected to explain how the environment influenced the development of an ancient society.
2.1 locate and describe the society using geographic concepts
2.2 explain how geographic features contributed to the development of the society
2.3 explain how human environmental interactions influenced the society

**Grade 6 - Social Studies**
Unit 2: Environment and Culture
6.2.2 assess the relationship between culture and environment in a selected cultural region
6.2.3 compare the use of resources and sustainability practices between Canada and a selected country
• explain reasons for different perspectives on the use of resources and sustainability practices

**Blackline Masters:**

## Appendix E1: Word Cloud from Regional Scholarly Sources



## Appendix E2: Word Cloud from National Strategies and Reports