"How Indigenous Knowledge and Western Science Can Complement Each Other and Collectively Strengthen Climate Action Initiatives. A Case Study of Sámi Indigenous Knowledge Integration in Norwegian Universities."

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5.9.23

1. Introduction

Through my master's thesis I will investigate Indigenous knowledge integration in university curricula, particularly in programs centred around climate change in the Arctic region.I will conduct a small-scale study of undergraduate and master's programmes curricula in three universities in northern Norway, that focus on climate education. Within this research, I will explore the opportunities and challenges of incorporating Indigenous knowledge into university curricula, and the methods of locating, using, and transmitting this knowledge. Through this research, I aim to contribute to the ongoing dialogue surrounding effective responses to the climate crisis, emphasising the potential for Western science, as the dominant knowledge system within universities, and Indigenous science to collectively enhance our understanding of the climate crisis and inform our responses.

Why should universities include Indigenous knowledge in programmes focused on climate education? Indigenous Peoples are increasingly being recognised for their invaluable contributions in climate change action (Sámiráđđi, 2023). This is due to their centuries-long traditions of effective sustainable resource management and safeguarding biodiversity (IPCC, 2022). In view of this, it is important to consider how we are shaping climate education. Investigating Indigenous knowledge integration in university curricula is one way to measure the extent to which we are valuing and incorporating alternative knowledge systems in the climate debate.

I start by giving a brief background to the Sámi, who hold the Indigenous knowledge that I will be focusing on in my research. I will then discuss the current climate situation in the Arctic, home to the Sámi, before explaining the intersection between the Sámi and climate change in this region. After identifying the key concerns for the Arctic within the climate debate, I will explore the underlying factors shaping our understanding of this issue. Here, I investigate the hegemonic role of epistemology - with a focus on Western epistemology - and its influence on knowledge production in education systems. I recognise that universities have a history tied to colonialism, and are dominated by Western hegemonic epistemologies such as Western science. Here, I explain how hegemonic epistemologies and colonial legacies continue to shape our

understanding of the world; I explore the place of Indigenous knowledge within this narrative and the implications of this within the climate debate. I argue that in order to make space for alternative epistemologies within the debate we must work to decolonise knowledge, giving some practical examples of how we can do this.

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2. Background

2.1 Who are the Sámi?

Norway is located in Northern Europe, with a population of 5.4 million inhabitants (The World Bank, 2023) including an Indigenous population. The largest and most well-known Indigenous group in Norway are the Sámi (Sami, Saami), who are the Indigenous Peoples inhabiting the region of Sápmi, a region which spans state borders and encompasses parts of Norway, Sweden, Finland and Russia. It is difficult to know the exact population of the Sámi due to the traditional semi-nomadic reindeer herding lifestyle, but estimates suggest somewhere between 50,000 to 100,000. Norway has the largest Sámi population, estimated at around 50-65,000, therefore accounting for between 1.06% and 1.38% of the total Norwegian population IWGIA (2022) .

There are nine different Sámi languages, five of which are spoken in Norway. The three most common of these are Northern Sámi, Lule Sámi and Southern Sámi, and though the Pirate Sámi and East Sámi have suffered a period of cultural and linguistic decline, they are currently going through a period of revitalisation. The Sámi languages are not related to the Norwegian language, or are in fact resemblant of each other, but despite these distinct language differences, the Sami people are connected by their shared cultural heritage of reindeer herding, traditional clothing and joik (traditional music). They are also bound by their shared history of oppression, and their continual fight for cultural preservation and rights as Indigenous Peoples.

Indigenous people have a long and complex history in Norway, which includes forms of colonialism, land dispossession, and cultural suppression. The Sámi people have been subject to a history of assimilation and acculturation and as a result of this, they have been constantly challenged with the erosion of their traditions and culture. In the 1700s the Norwegian government devised an official policy, known as ‘Norwegianisation’ to assimilate the non-Norwegian-speaking native populations, as part of a nationalist agenda for ethnic and cultural uniformity. During this time, Christian doctrines built churches in Sápmi areas to purge the people of what they called paganism. Priests punished spirit leaders and condemned the joik as the work of the devil, which Boine (2021) argues was a way of controlling their spirit. This process was originally directed at the Sámi, but later included the Kven, a smaller, less widely recognised Indigenous population in northern Norway. Within this policy, the Sámi were

prohibited to speak their own languages and had to learn Norwegian. If the Indigenous People were heard speaking their native languages they were punished. As a result of this, less than half of the Sámi in Norway speak a Sámi language. (Keskitalo et al, 2013)

Like many Indigenous People, the Sámi have struggled to maintain control of their ancestral land and have often been displaced, as a result of land grabbing by both the government and private companies. However, Norway has made efforts to return some of these lands to Indigenous communities and has reformed policies to provide legal protection for Indigenous land rights. One example of this is The Finnmark Act (2005) which transferred ownership of private land in Finnmark country to the establishment of 'The Finnmark Estate'; a publicly owned entity responsible for managing land and natural resources in the county of Finnmark, managed by both the Sámi and non Sámi inhabitants of the region (Solbakk, 2014). The Finnmark Act marks a significant milestone in the recognition of Sámi land rights and addressing historical land grabbing in the region. However, despite the increased recognition of Indigenous rights, the Sámi continually struggle to defend their territories land rights and management of natural resources which are in turn affecting their traditional fishing grounds and reindeer herding areas. In September 2023, Sámi activists demonstrated outside the Norwegian parliament to protest against wind turbines built on Sámi reindeer pastures. Even though in 2021, the Supreme Caught ruled these wind farms a violation of Sámi rights, the turbines continue to be operational (Fouche, 2023).

2.2 Climate Change in the Arctic

Climate change in the Arctic is happening at an unprecedented rate, three times faster than forecast for other world regions. The accelerated melting of sea-ice, glaciers and ice sheets has a detrimental effect on the ocean's salinity, sea levels, and circulation throughout the world. These changes in the polar ecosystems can induce climate change and also global warming (Sámiráđđi, 2023). Therefore, the Arctic remains a critical area of focus in climate debates.

2.3 Climate Change and Sámi Intersection

The regions Indigenous Peoples typically inhabit are extremely climate sensitive, and therefore are susceptible to extreme weather events such as heatwaves, droughts, heavy rainfall and thawing of permafrost. Research shows that, despite having contributed very little to global emission, Indigenous Peoples are being disproportionately affected by climate change (IWGIA, 2022, Sogbanmu et al., 2023, Sámiráđđi, 2023). In Norway, the Sámi are already experiencing immediate effects, highlighting the critical intersection between climate change and their traditional way of life. Like most Indigenous Peoples, Sámi traditions are characterised by a deep connection to the natural environment, relying on the land and natural resources not only for their survival means, but also as a source of spiritual wellbeing. However, climate change has negatively impacted Indigenous subsistence resources (IPCC, 2022). For instance, traditionally, Sámi livelihoods are centred around reindeer herding and fishing, however, due to an increase of permafrost, reindeers are struggling to find food and dying of starvation. This has dire consequences for the Sámi communities economic stability, food security and more broadly, the Sámi culture and way of life (Sámiráđđi, 2023).

Climate change interventions in Norway are also having detrimental effects on Sámi peoples livelihoods. In September 2023, Sámi activists demonstrated outside the Norwegian parliament to protest against a wind farm built on Sámi reindeer pastures. Despite the fact that in 2021 the Supreme Caught ruled these wind farms a violation of Sámi rights, the turbines continue to be operational (Fouche,2023). Therefore, while the Sámi continually struggle to defend their territories, their traditional fishing grounds and reindeer herding areas are being affected.

3. Literature Review/ Theoretical Framework

Hegemonic epistemologies represent the dominant values, beliefs and power structures within a society, shaping the way we perceive reality and understand the world. They are often formed through the convergence of different fields, such as science, politics, religion, and economics to form a dominant ideology. These epistemologies are often reinforced and perpetuated by the dominant powers in a society to influence the way we think and behave (Breidlid, 2013). Institutional powers such as education systems can reinforce these beliefs, and in turn strengthen the hegemony.

3.1 Eurocentrism

One example of a Western hegemonic epistemology is 'Eurocentrism', which refers to the belief in European superiority and often involves the oppression and exploitation of non-European people and cultures, which was common practice during the era of European colonialism (Wallerstein, 1997). This perception of the West as a superior entity fueled the colonial discourse, and 'epistemic conquest of the South' (Breidlid, 2013, p7). Cultural imperialism by Europe instilled the eurocentric belief that European history, culture and ideologies are superior and therefore should be imposed on the rest of the world (Wallerstein, 1997). During colonial rule, these cultural impositions from the West meant rejecting diversity, which created inferiority and othering. This othering included race and gender but also extended to knowledge and education systems. The West were regarded as the superior entity with Western hegemonic epistemology seen as the only means of achieving progress and development. This othering created cultural alienation and a sense of inferiority in schools but also decided the course of development for the Global South in the post-colonial era (Breidlid, 2013). The production and reproduction of eurocentric ideology can be linked to colonialism and its lasting legacy.

3.2 Colonialism

Colonialism is the maintenance of political, economic and sociocultural dominance over people by a foreign power, over an extended period of time (Bell, 1991). Colonialism can be viewed as a tool for producing and reproducing hegemonic epistemologies by imposing the knowledge and values of the colonial powers onto the colonies, suppressing and even erasing other knowledge and affecting their understanding of the world. The legacy of colonialism remains today and can

be recognised by the persistence of colonial languages, curricular, teaching methods, values and aspirations in many countries, particularly in the Global South. These colonial legacies enable broader society and governance structures to oppress Indigenous Peoples through continued land grabbing, cultural erasure and economic exploitation, irrespective of Indigenous Rights. Climate change adds another source of concern as Indigenous lands and resources are threatened and exploited, in the name of climate mitigation (Sámiráđđi, 2023).

3.3 Decolonisation Theory

Decolonisation theory is multifaceted and difficult to define, but broadly speaking it refers to dismantling existing colonial structures, the ideologies behind them and the perpetual inequality they create, in order to strive for a systemic transformation with equality as its goal. (Last speaker) defines decolonisation as an active, continual process of internal examination, which involves unlearning our existing knowledge and our norms. In line with this notion, Finbog (2023) views decolonisation as 'an internal process', but instead believes we should focus on 'Indigenisation' rather than colonisation. Finbog explains this process as implementing Indigenous knowledge from the Indigenous epistemological viewpoint, as in fact having no character or dominant form of knowledge, and as presenting an opportunity to constantly question the basis of an argument; it is a struggle against the normative power structure that can shape a space.

3.4 Decolonisation efforts

Decolonisation efforts often involve challenging and dismantling hegemonic epistemologies to restore and honour Indigenous knowledge and cultures. Mignolo (2007) argues that in order to make space for non-hegemonic epistemologies, a de-colonial epistemic shift is needed. This requires an effort to decolonise knowledge and thus interrupt the dominant understandings about society, education and the general understanding of the world, making space for other epistemologies, a process which Mignolo calls 'delinking'. Mignolo believes that this should enable us to move away from the previous geo-politics of knowledge and instead build inter-epistemic communication, representative of a new 'pluri-versality'. In support of decolonising knowledge, Andreotti (2010) suggests a postcolonial orientation should involve four key concepts: 'learning to unlearn, learning to listen, learning to learn and learning to reach

out' (Andreotti, 2010, p246). Adreotti describes 'learning to unlearn' as learning to recognise what we consider as 'good' is our perspective and one one perspective, which is socially, historically and culturally bound. While, 'learning to listen' involves recognising the limits of these perspectives and being open and receptive to new understandings. Next, 'learning to learn' requires expanding and deepening our understanding through considering other perspectives and engaging with different logics and reasoning, 'avoiding the tendency to want to turn the other into the self or the self into the other' (p247). Finally, 'learning to reach out' requires continual reflection through exploring new ways of being, thinking, doing, knowing and relating with others in uncoercive learning.

3.41 Reframing Indigenous knowledge as Indigenous Science

The climate crisis is evidence of an urgent need to question the hegemonic perception of the world, which has been grounded in the epistemological assumption of Western science and technology as the continued solution, without much consideration for alternative options (Breidlid, 2013, Hickel, 2019). Further recognition of the contributions of other civilisations to our understanding of nature, such as the increasing use of traditional ecological knowledge now being used to find new drugs, may enable us to discover new concepts that may aid the reconciliation of empiricism and science (Iaccarino, 2003, as cited in Breidlid, 2013) .

Wiggan (2019) argues that Indigenous knowledge or TEK should be reframed as Indigenous science, as it is developed through the same principles of western science, namely observations, experimentations and analysis. Wiggan notes how this knowledge is already valued by some scientists and researchers, who are using it to inform sustainable management practices, due to Indigenous Peoples extensive knowledge and experience of phenomena such as floods, droughts and ice ages that they have witnessed for thousands of years. Wiggan explains that Indigenous peoples have collected and developed extensive knowledge which has been passed on from ancestors for adaptation and resilience, and has therefore become embedded in their cultural practices, resource management practices and social systems. Similarly, Sidik (2022) references how scientists often use Indigenous knowledge to guide their work; relying on Indigenous people to help them find wildlife, navigate rugged terrain and understand weather changes. However, Sidik points out that these relations have often felt colonial, with researchers entering

communities, extracting their knowledge through data collection and leaving without ever contacting the locals again, nevermind consulting or acknowledging them in the publication process. Further, Chavez (as cited in Sidik, 2022) argues that 'When Western scientists claim credit for discoveries that Indigenous people made first, they're stealing Indigenous people's contributions to science.' Thus, in giving Indigenous knowledge scientific status, we acknowledge the validity and rigor of Indigenous knowledge systems, and begin to address the power imbalances and colonial legacies interwoven within the utilisation of Indigenous knowledge in Western Science.

3.42 Reframe the overall approach- 'Weaving Together'

There is a continuous dialogue on how we can bring together different knowledge systems, such as Indigenous knowledge and western science. Chavez (as cited in Sidik, 2022) argues that approaching the subject by questioning *how* to 'integrate' Indigenous knowledge *into* western science, 'upholds the unhealthy power dynamic between Western and Indigenous scientists. It makes it sound as though there are two singular bodies of knowledge, when in fact Indigenous knowledge — unlike Western science — is drawn from thousands of different communities, each with its own knowledge systems'. Therefore, in line with this notion, we must think critically about how we are framing the issue. Wiggan (2019) suggests that it is not a case of 'integrating' or 'including' Indigenous knowledge but instead 'weaving together' Indigenous knowledge and science. Wiggan argues that within this framing, there is a great opportunity for science and Indigenous knowledge to come together and stabilise our planet and existence, believing that, 'they will both complement one another if we be serious about integrating that knowledge as part of mainstream awareness and practice' (8:13). Hikuroa (as cited in Sidik, 2022) supports this notion of weaving together, arguing that 'when you weave two strands together, the integrity of the individual components can remain, but you end up with something that's ultimately stronger than what you started with'.

3.43 Greater acknowledgement of Indigenous scholars

Academia is dominated by Western notions and scholars, reinforcing the message that alternative epistemologies to the dominant hegemony are not valuable. The lack of inclusion of Indigenous knowledge and perspectives in addressing the climate crisis can be seen as limiting our capacity

to act effectively, using Western science and Indigenous knowledge complementarily. Consequently, we must explore indigenous knowledge through a critical lens and provide these alternative epistemologies with a platform in order to challenge the current hegemonic knowledge system (Breidlid, 2013; Hoppers, 2000) offering alternative knowledge and approaches to the climate debate. In doing so, we must look at the existing systems in place within academia and ensure they facilitate this. Grenz (2023) recognises a potential barrier for Indigenous scholars in the existing research-ethics process, and argues that despite efforts to decolonise ethics boards by accepting Indigenous research methodologies, the process and criteria is still created for non-Indigenous researchers. This highlights a need to Indigenise the research-ethics process, as according to Grenz, the current one is not in line with Indigenous ways of being and can in fact be disrespectful to the culture. Grenz states that, 'the mathematics of Indigenizing research-ethics processes is not simply one of addition — adding inclusive policies and diverse perspectives. It must include subtraction: it means giving up control. Honour Indigenous ways of knowing, understanding and doing.'.

4. Methodology

Qualitative research is non numerical and generally uses small sample sizes to carry out an in depth study of a phenomena. It is concerned with finding reasoning and meaning, using personal experiences and insights (Flick, 2018). My research is focused on participants' experiences of the university programmes in Norway and therefore lends itself to qualitative methods. I will be using a mixed methodological approach of semi-structured interviews and document analysis. This use of triangulation will allow me to see whether what I find within one source of data, corresponds with another, and thus improve the validity and credibility of my data. I will be conducting a case study as my research involves an in-depth exploration, using various data sources, to gain a comprehensive understanding of the integration of Indigenous knowledge in a selection of climate focused Norwegian university programmes. I will therefore offer deep insights into the current situation in this specific context within these selected programmes. .

4.1 Sampling

I will select a number of undergraduate and masters programmes from Norwegian University of Science and Technology (NTNU), University of Tromso (UiT), Nord University and Sámi Allaskuvla (Sámi University of Applied Sciences), which focus on climate change and sustainability in the Arctic region. I have chosen undergraduate and master's programmes as opposed to individual courses as they are comprehensive programmes which provide qualifications and are designed and advertised as leading to specific career paths. I have selected programmes which are climate action focused such as Cold Climate Engineering, Natural Resource Management, Nature Management, BioScience, and Ocean Leadership, but also programmes which are concerned with geopolitical issues and how to manage these issues, such as Circumpolar and Nordic Studies, Northern Studies, Indigenous Studies, Global Management and Governance and Entrepreneurship in Northern and Indigenous Areas. Through selecting courses covering different disciplines, I am taking a holistic approach to knowledge integration in this context, with the aim of gaining an in-depth understanding of the multifaceted factors at play when addressing climate change in the Arctic.

4.2 Semi-structured Interviews

Flick (2018) explains semi structured interviews as a guided conversation which allows for in depth discussion. Thus, the flexibility of this method of data collection allows the researcher to follow interesting insights which arise during the conversation, and also the possibility to ask participants to clarify points if necessary. This possibility to revisit points also adds to the validity of the data. During semi-structured interviews, researchers are also able to gain further insights from participants non-verbal cues, such as gestures, facial expressions, and pauses, further enriching the quality of the data. Semi-structured interviews also offer a standardisation of data collection, as there will be similar questions asked to each participant. This aids the analysis stage. However, it is worth noting that people can interpret questions in different ways and therefore this must be taken into consideration when analysing and comparing data.

I will conduct semi-structured interviews with programme leaders and associate professors to gain more of an in-depth understanding of the programme, to hear their insights on the design, implementation and continual review of the programme. For instance, I will ask them how the curriculum was decided and how the reading list was compiled. I will also ask their opinions on the strengths and limitations of the programme. I will also conduct semi-structured interviews with people in the selected university that are associated with environmental initiatives, such as sustainability officers. Finally, I will conduct interviews with other organisations affiliated with the university programme, such as the Sámi Centre. These interviews will provide further insights into the current community engagement and collaboration, in the design and implementation of the programme.

4.3 Document Analysis

A document analysis is an accessible and efficient way of collecting data as it does not require informed consent and allows for an in depth analysis of a particular theme. Though it may be seen as restrictive in that it does not provide the full picture, I will be using it in collaboration with other methods and therefore it may provide valuable insight into one particular aspect of the research, such as a university programme handbook describing what the university programmes claims to do. This will allow me to compare data from professors' experiences of the programme with what is outlined in the document. I will analyse documents related to each programme’s

curriculum, reading materials, and any environmental sustainability initiatives undertaken by the universities.

4.4 Ethical Consideration

When conducting qualitative research, concerned with participants' personal experiences and feelings, there are many ethical considerations. First, one must ensure that they do not, at any point, cause any harm. In addition to my own careful consideration and continuous reflection through my project, I will follow a number of other procedures to ensure my research is carried out ethically. I will apply for approval from Sikt/NSD (Norwegian centre of data research). This application will include a project description, with my aims, methods of data collection, an interview guide, and consent forms. I will provide potential participants with consent forms, which will explain the scope of my research and I will receive written or oral consent from those who choose to take part in the research. Participants will be aware that they can withdraw their consent at any time during the process, either verbally or in writing, and without reason. This can happen during or after the data collection has ended and if their consent is withdrawn, all personal data will be deleted. I will also explain how data will be stored and shared, which is in line with GDPR and Oslomet regulations for data collection and storage. In order to ensure that the participants cannot be identified, I will use pseudonyms, unless otherwise requested by the participants.

I must be aware of my unconscious bias and actively work to mitigate it. I must regularly assess and reflect on my position as a non-Indigenous researcher within this context. I will do so by approaching my research with an open mind, regularly reviewing my data and findings, and critically examining any assumptions or generalisations made during the analysis. Additionally, I must consider the power dynamics that may exist between myself, in my role as a researcher, and the participants, considering their role and possible positionality, such as a professor representing a university. I must ensure that I create a safe and comfortable space for participants to share their experiences without feeling intimidated or coerced. In order to avoid any power imbalances, I will strive to build a rapport with the participants and establish trust through being honest about the research goals and objectives and transparent about what their participation will involve. I will provide feedback throughout the research process and I will give participants the

opportunity to ask questions. I will also discuss with participants how they would like to be referred to in my project. I will give participants the opportunity to read what I have written about them if they request so and discuss whether they would like a follow up, such as a copy of my thesis on completion. I will also translate all documentation into Norwegian and Sámi languages so that participants can access the information in their preferred language, as this will aid their understanding. These measures will work to ensure that participants' voices and perspectives are represented fairly and accurately.

Due to the limited amount of time available for our fieldwork, it is important that I fully immerse myself in the context immediately. Whilst it would have been possible to carry out online interviews, I wanted to carry them out in person, as this will allow me the best opportunity to build a rapport with people and develop trust. I will do this by spending time in a number of different areas in northern Norway outside of my direct fieldwork, experiencing the daily life and culture of these areas. Lindskog (? lecture) suggests asking others about local customs on arrival as a useful tool and an important part of gaining cultural understanding. Furthermore, carrying out my fieldwork in the actual setting will help me to develop a thick description. Flick (2018) describes a thick description as developing an in-depth understanding of the context, understanding the place and people through detailed description of the social and cultural environment. Ninkova (?? from lecture) suggests that one way of building a thick description could be through noting as much as possible, both in relation to the project and also things that spark interest. She suggests mapping the environment, and journaling personal reflections at the end of each day as useful to navigating fieldwork but also as offering potential insights when revisited after fieldwork. During my fieldwork, I will draw maps of the universities and document daily reflections for the duration of my trip. Transparency of data collected from and about participants also facilitates a thick description as participants can validate the data which has been written and ensure they have been represented fairly and accurately.

I will be using both inductive and deductive approaches within my research. I understand an inductive approach as one which first looks at the empirical data in order to create a theoretical framework, and a deductive approach as one which uses theoretical frameworks to guide the research and form hypotheses before carrying out the research and collecting empirical data. I

will use a deductive approach in the sense that my research is grounded in theoretical concepts such as decolonial theory and thus have formulated my initial stand point. For example, in using decolonial theory, I am commencing my research from the standpoint that educational institutions can be considered as a colonial tool and therefore advocating for a transformative model of education rooted in decolonial thought, whereby Indigenous knowledge is given space and valued. However, I will also be using an inductive approach in that I am open to my findings challenging this standpoint and highlighting other concepts, theories and frameworks. In support of the inductive approach, I have no clear hypothesis to prove or disprove.

4.5 Data Analysis

I will use inductive thematic analysis of my data. This means that I will analyse my data systematically to generate themes and sub themes. I will do so by looking for repeated words, phrases, concepts or themes and coding each of these accordingly. I will use colour coding to clearly highlight such themes and sub themes. For example, during the interviews, I will be asking professors their opinions on the opportunities and challenges of including Indigenous knowledge into the curriculum. Thus, I will highlight identified opportunities in one colour and challenges in another. Following this, I will collate the data on strengths and look to identify commonalities within this theme. I will then do the same for the challenges. I will then repeat this process multiple times to see if new themes arise. When analysing my data, I will not just be looking for commonalities, for instance, within themes, but also for anomalies as these can offer important insights also.

5. Working Plan

September	Proposal/Literature Review
October	Interview Guide/ NSD Application/ Contact participants
End October-beginning November	Fieldwork in Norway
November	Transcriptions + Coding
December	Analysis + Report on progress
January	Continue Literature Review (based on findings)
February- April	Writeeeeee
April	Full draft
May 15th	Submit Thesis

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