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Editorial

Blair Niblett & Tara Flynn (on behalf of the editorial team)

The CJEE editorial team is pleased to present Volume 26 of the journal. We offer our thanks to the authors and reviewers who have contributed to the thoughtful papers presented herein. After a series of primarily special issues over the last few years, we are excited that this volume emerges from an open call for papers that highlighted the ever-increasing complexity of engaging with environmental education (and environmental education research) in a world that has been grappling with crisis-level challenges including pandemic disease, war, significant political unrest, environmental degradation, and an active and increasing climate emergency. The resulting papers tackle many of these challenges both directly and indirectly, and offer compelling justification for environmental education to function as a process for understanding the current moment in which humans and more-than-human beings live. The authors highlight social-ecological intersections, and complex interrelationships, and position environmental education as a mechanism for action that aims to bring our practices of living into greater alignment with ecological principles that can sustain planetary wellbeing. The nine papers are diverse in both context and approach. Each cultivates current-moment understandings of socio-ecological interrelationships, and many provoke action toward better planetary living.

In a unique paper for CJEE, Simon Beames, Jannicke Høyem, Imre van Kraalingen, Jørgen Eriksen, Thomas Vold, Kristian Abelsen, Axel Rosenberg, & Trond Augestad explore the ecological implications of outdoor adventure educators' selection of outdoor clothing for maintaining the safety and comfort of instructors on field courses. Their paper, titled **"The Jacket: Making Sustainable Clothing Choices in Outdoor Education"** documents the process of formalizing their deliberations about which shell jacket their outdoor education team would purchase into a practitioner inquiry research project. Their inquiry resulted in themes illustrating the complexities of trying to balance the durability and functionality of outdoor equipment with sustainable purchasing principles.

Next, Doug Karrow and Sharon Harvey engage in an onto-epistemological navigation of the field of environmental education in their paper titled **"The *Thalweg* of Currents: Naturalist Environmental Education."** Karrow and Harvey revisit Lucie Sauve's seminal paper titled "Currents in Environmental Education: Mapping a Complex Pedagogical Field" from Volume 10 of *CJEE* to propose that among Sauve's suggested environmental education currents, the naturalist current can operate as a metaphorical *thalweg*—the hydrological base of a river valley towards which water gravitates. The *CJEE* editorial team is thankful to Karrow and Harvey for their deep analysis of Sauve's original C*urrents* paper, which is one of the most accessed articles in the CJEE back catalogue. We encourage other readers and authors to submit papers which respond to and extend CJEE published works in thoughtful ways.

In her paper, **"Empowering Spiritual Human-Nature Relationship through Mindfulness Pedagogical Paths"**, Irida Tsevreni makes the compelling case for considering the pedagogical affordances of mindfulness within environmental education, in particular with respect to an eco-spiritual dimension. In considering this dimension, the author adds to a body of work on mindfulness in education that goes beyond stress management and improving personal wellbeing, to look at mindfulness as a spiritual endeavour with great potential for fostering holistic thinking and a connection between humans and nature.

Estella Kutcha and Sean Blenkinsop explore the ecological and pedagogical limitations and opportunities of the English language in their paper titled **"Toward a More Eco-Relational English."** Beginning with an ecologically focused narrative, they point out the power of language to explicitly and implicitly shape the way that language users relate to the world. They note that English, as a dominant language globally, has risks for ecological oppression because of a hyperfocus on objects and human selves (often at the expense of relationships), but also point to possibilities for leveraging relationality in English communication by adopting linguistic shifts that centre interrelationship. The paper offers a unique melding of ecolinguistics and environmental education that may be of interest to both researchers and practitioners.

Jennifer MacDonald, in her paper **"Getting There from Here: Mapping as a Process for Relationship Renewal,"** examines maps as a means of reconsidering relationships between people and the more-than-human world. MacDonald considers the colonial history of maps as a tool emerging from the European Enlightenment, and juxtaposes such dominant understandings with more relational understandings of maps developed from an anti-colonial perspective. She concludes that this renewed understanding of mapping processes can create opportunities for students to be "brought into dialogue with cycles, patterns, and rhythms of other lifeforms to uncover insights about who they are... and to learn within kinship networks toward renewing and enhancing relationality" (p. 93).

Sean Blenkinsop and Linda Wihelmsson offer a paper titled **"Ecologizing Bildung: Educating for the Eco-Social-Cultural Challenges of the 21st Century,"** in which they propose that the German construct known as *bildung* can be modernized and ecologized in order to aid in thinking about multiple overlapping socio-ecological problems and injustices that are the primary global challenges of the twenty first century. The authors suggest that this ecological modernization of *bildung* may facilitate socio-ecological flourishing by leveraging *bildung's* history of seeking justice and cultivating cultural change.

Next, in **"Regenerative Capacities: Bringing Social Studies and Indigenous Studies Together for Education that Responds to Climate Crisis"**, Heather E. McGregor, Sara Karn and Micah Flavin present findings from interviews with 13 Ontario teacher educators and researchers with specialties in social studies, history and related fields. While acknowledging that deep change lies

beyond curriculum and lesson plans and calls out for a holistic and decolonizing worldview, this study sought to reveal possibilities for climate crisis-responsive curricula within current K-12 academic expectations and course structures with particular attention to Indigenous knowledges and relationships. Exciting directions for the future are noted, including opportunities for taking a species-centred approach to teaching and learning, and providing space and acknowledgement for spiritual ecological connections.

In her paper titled **"Wisdom From Lichen: The Ecology of Anti-Oppressive Environmental Education"** Sarah Urquhart asks: what wisdom can lichen share with us? And, how can we apply what can be learned from lichen ecology to the study of anti-oppressive environmental education? Using lichen's ecological process of breaking apart longstanding rock structures as a metaphor, Urquhart describes the potential of environmental education to contribute to the erosion of "fossilized" sociocultural structures such as racism, coloniality, and cis-heterosexism. She posits that while environmental education has long upheld these social oppressions, that there is potential, through decolonial and queer ecopedagogies to (re)orient environmental education towards socio-ecological "flourishing and thriving".

Paul Elliott, Hillary Inwood, and Yovita Gwekwerere's paper titled **"Emerging Leadership Strategies in Environmental and Sustainability Education in Preservice Teacher Education"** offers an outline of the authors' collaborative action research process for assessing their leadership in the context of environmental and sustainability education (ESE) within teacher education programs in Ontario. Their approach to action research mobilized critical friendship through dialogue in order to allow for themes to emerge around leadership strategies that may help extend the impact of ESE in teacher education, with hope for broader ripple effects as pre-service teachers move into school systems. Key themes include place-mindedness, small-scale excellence, balancing patience and action, creativity, and collaboration. This paper adds importantly to a knowledge-base around faculty leadership as a driving force in ESE within teacher education.

Finally, in their paper, **"Invasive' Species Discourse in Ontario Elementary and Secondary Curricula: A Critical and Decolonial Analysis,"** Marleine Gélineau, Constance Russell and Lisa Korteweg report the results of their analysis of nine curriculum documents in the province of Ontario. Looking at explicit, hidden and null curriculum across both the elementary and secondary school panels, the authors found not only a concerning decrease in the number of expectations related to non-native or newcomer species, but an erasure of Indigenous perspectives on migrating species. Contrary to Western perspectives, which emphasize economic impacts, and use militaristic and xenophobic rhetoric to describe "invaders," Indigenous cultures have found ways to incorporate and even embrace newcomer species. This paper is a call to environmental educators and researchers, particularly in the context of Truth

and Reconciliation, to engage mindfully with curriculum related to newcomer species and to consider the ways in which we might engage with Indigenous knowledges which offer “less anthropocentric, more nuanced, and reparative” perspectives on non-native species.

The Jacket: Making Sustainable Clothing Choices in Outdoor Education

Simon Beames, Jannicke Høyem, Imre van Kraalingen, Jørgen Eriksen, Thomas Vold, Kristian Abelsen, Axel Rosenberg, & Trond Augestad, Norwegian School of Sport Sciences, Institute for Teacher Education and Outdoor Studies, Norway

Abstract

Amidst a vast jungle of products, brands, materials, labels, and systems of global trade and production, it has become increasingly challenging to make consumption choices that may be considered "sustainable". This inquiry examines the decision-making process of a team of university outdoor environmental educators, as they puzzled over the most appropriate shell jacket to purchase for their outdoor teaching. The project's first aim was to determine the team's most important features of sustainability with regard to clothing procurement, while the second was to interrogate these features in relation to germane literature and guidance. Driven by a practitioner inquiry approach, the team of eight interrogated their own beliefs, assumptions, and knowledge about outdoor clothing over seven months. Data were generated through four group discussions, where the content from each was thematically analyzed and then used as a platform for the following meeting. Ultimately, four factors emerged as central to informing their outdoor clothing purchases: (1) durability, (2) assurances of ecologically friendly production, (3) assurances of fair labour conditions, and (4) underlying socio-political motivators. Navigating the varied and shifting ground of eco-labels and certifications in relation to environmental sustainability and fair labour conditions is highlighted as a central challenge to making nature- and human-friendly purchases. Interrogating the drivers and surrounding information around material consumption is positioned as a valuable pedagogical enterprise in itself.

Résumé

Dans la vaste jungle de produits, marques, matériaux et étiquettes qui nous sont offerts par des chaînes mondiales de production et d'échanges commerciaux, il est de plus en plus difficile de repérer les choix de consommation véritablement durables. Cette enquête examine le processus décisionnel d'une équipe d'enseignants universitaires en environnement pour l'achat de vêtements destinés à leur enseignement en plein air. Dans le cas étudié, l'équipe voulait déterminer la veste à coquille respectant le mieux les principes de durabilité. Le premier objectif du projet a été de définir les principales caractéristiques de durabilité liées à l'achat de vêtements. Le second, de situer ces caractéristiques dans la littérature scientifique et les lignes directrices en la matière pour prendre une décision éclairée. Dans une démarche de réflexion sur leur pratique, les huit enseignants ont examiné leurs croyances personnelles, leurs hypothèses et leurs connaissances relatives aux vêtements de plein air sur une période de sept mois. Les données

générées proviennent de quatre discussions de groupe; après chacune, le contenu était analysé par thème pour orienter la suivante. En conclusion, l'enquête révèle quatre facteurs centraux ayant guidé l'équipe dans l'achat de vêtements de plein air : 1) la durabilité; 2) l'assurance d'une production écologique; 3) l'assurance de conditions de travail équitables; 4) les motivations sociopolitiques sous-jacentes. Le principal défi d'un processus décisionnel qui vise l'achat de produits respectueux de la nature et de la personne est de trouver des repères fiables, qui garantissent une durabilité environnementale et des conditions de travail équitables, parmi les multiples étiquettes et certifications écologiques toutes plus nouvelles les unes que les autres. L'examen des facteurs de consommation matérielle et de l'information associée représente en soi une initiative de valeur pédagogique.

Keywords: outdoor education, outdoor recreation, clothing, sustainability, eco-labels, practitioner inquiry

Mots-clés : éducation en plein air, activités en plein air, vêtements, durabilité, étiquettes écologiques, démarche réflexive en enseignement

It is not unusual for people with some amount of privilege and conscience to be making consumer choices based on what they consider to be "sustainable." The trouble is, of course, that these choices are often rooted in "wicked problems," which feature intertwined parts that are complex, fluid, and not entirely known or understood (Rittel & Webber, 1973). This is the story of how the staff at one university outdoor environmental education program in Norway tried to come to a decision about what kind of team jacket they wanted to purchase for their professional outdoor work.

The physiological strains and risk of being harmed associated with many outdoor activities make choices regarding outdoor clothing highly important (Morrisey & Mossi, 2013). A shell jacket is a solid outer layer that protects the wearer from wind and moisture and can be used in a various landscapes and weather conditions. While the particular characteristics of a jacket (i.e. size, shape, colour) may differ across individuals, the first concern was to find a product possessing the high levels of functionality that our work demands. Of course, health and safety are important factors in our decision-making, but, ultimately, we want to be comfortable and able to teach well in natural settings, in a variety of weather conditions, for sustained periods of time.

Technological advances have brought about lighter clothing that allows for more unrestricted movement, features certain accessories such as a phone pocket, and provides more comfort and protection on the highest peaks and the wettest days. It may be, however, that the specificity of a jacket's function may limit its applicability in a variety of contexts, hence resulting in it seeing limited use (Klepp & Tobiassen, 2020b). Some might argue that responsible adventurers

should let the properties of sustainable textiles determine what activities are possible in which kinds of environments. While it may be that non-sustainable, petroleum-based textiles have afforded humans unprecedented protection from the elements, many consumers perceive “sustainable” clothing (e.g., fair trade and organic clothing) to be less durable (Jacobs et. al., 2018). More recently, however, it has been argued that the same protective properties of a textile can be achieved in different, and more sustainable, ways (Klepp & Tobiasson, 2020b).

In our positions as outdoor educators, we set examples—not just by our practices, but also by our choices of gear and clothing. Concerned with the current state of the planet and debates on sustainability, we agreed that it was crucial to consider the values we wanted to represent as a team through our consumption choices. It was agreed that functionality would be a given and thus we embarked on a thorough methodology of reflecting on our own consumption practices and educating ourselves on the evidence-based arguments surrounding sustainability in outdoor clothing.

In our work in the field of outdoor environmental education, living sustainably demands the kinds of critical thinking that permits us to thoroughly interrogate the information “surrounding the consumer activity that is an inescapable part of our adventure practices” (Beames, Mackie & Atencio, 2019, p. 178). While framing a set of practical considerations regarding sustainability was expected to be straightforward, our initial dialogue turned into extended and heated discussions about identity, values, durability, textiles, eco-labels, environmental care, labour conditions, personal integrity, and fiscal responsibility—all of which are collectively described by some researchers as technical and social qualities of clothing (Klepp & Tobiassen, 2020b). The pursuit of selecting a sustainable shell jacket became highly challenging.

One’s ecological footprint is also a matter of how often we replace clothing (Klepp et al., 2020), and we unanimously agreed that one should repair jackets (and other equipment) until they are no longer serviceable. When it comes time to replacing them, however, the results of this inquiry will guide our purchasing strategy. As university outdoor environmental educators, this knowledge also has pedagogical implications in our everyday work, by offering an educational platform upon which critical reflection, discussions and debates with our students can take place.

We invite readers to join our journey which attempts to negotiate the jungle of advice on sustainable consumerism. This journey features four research questions. First, what did our staff team determine to be the key factors of sustainable consumption when purchasing an outdoor jacket? Second, how does the available guidance literature relate to our factors? Third, how can these factors contribute to developing clearer guidelines for buying outdoor clothing and equipment, more generally? And, fourth, how can this knowledge actively shape approaches to teaching and learning in the fields of outdoor education and recreation?

This paper next outlines the literature we reviewed and then describes the methodology. The section after that explicates the four findings yielded by our discussions. Thereafter, we interpret these findings with germane literature. Finally, the paper highlights key suggestions for generalizing the findings to related practices.

Sustainability and Outdoor Clothing

Much new, technical clothing on the market is made of plastics and chemicals. Fletcher (2019) states that we lock ourselves within layer upon layer of plastic to enjoy nature, and claims that this increases the distance between humans and the planet that sustains them. Yet, debates on exactly *how* to be sustainable are ongoing, and a seemingly simple act such as choosing outdoor clothing exemplifies the multiple layers of complexity that feature in our everyday practices and choices. This section explores the issues around sustainability and examines existing guidelines from the textile industry that aim to inform consumers about their purchases.

Most outdoor garment manufacturer websites lack detailed information about the degree to which their practices are sustainable. Thus, to find the guidance required to make informed and enlightened purchases, consumers are often faced with the overwhelmingly difficult and time-consuming task of gathering manufacturing details for each product that is being considered or choosing among a dizzying array of eco-labels that may have incomplete (Turunen & Halme, 2021), inaccurate or misleading information (Klepp & Tobiasson, 2020). Indeed, consuming with a conscience has the capacity to become an exhausting endeavour.

Sustainability became a global buzzword when Norwegian prime minister Gro Harlem Brundtland introduced the report *Our Common Future* in 1987 (UN, 1987). The report described sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (1987, p. 37). The concept of sustainable development has been criticized for promoting the principle of economic growth, which many claim is incompatible with the idea of a sustainable world (Sinnes & Straume, 2017). The term sustainability itself has been characterized as complex, contested and under constant negotiation (Ramos et al., 2020). Further, scholars have claimed that the “ambiguity and lack of clarity about the concept of sustainability is a recurring obstacle to sustainability research” (Salas-Zapata & Ortiz-Muñoz, 2019, p. 153). Our inquiry follows Salas-Zapata and Ortiz-Muñoz’ (2019) view that, while sustainability can be seen as an overall goal for humankind, it can be more usefully defined as “a set of guiding criteria for human action” (p. 157). These actions can include, for example, “utilizing renewable resources, enhancing human well-being, avoiding ecosystem degradation, and generating social and cultural benefits” (Rosenberg et al., 2021, p. 3).

The Sustainable Development Goals (SDGs) from the United Nations provide a global policy "backdrop" to our inquiry, and it is appropriate to briefly outline how our investigation is located within them. Adopted in 2015, the SDGs set global aspirations and priorities to combat social, economic, and environmental challenges (UN General Assembly, 2015). Henninger and colleagues (2016) note that sustainability debates were initially not concerned with the production and distribution of clothing and garments. However, the role played by the resource- and labour-intensive clothing and textile industry in contributing to the degradation and pollution of natural systems has been increasingly acknowledged (Carrone, 2020; Fletcher & Tham, 2014; Joy & Peña, 2017).

The SDGs that are especially relevant to our inquiry are: i) SDG12, responsible consumption and production, ii) SDG13, climate action, and iii) SDG15, life on land: protect, restore and promote sustainable use of terrestrial ecosystems. Translated to the context of outdoor clothing, these three goals ask humans to reflect on production and consumption practices (e.g., labour conditions, traceability, the quality and quantity of our purchases); carbon footprints (e.g., carbon emissions from transportation and "production proximity" (Nordås, 2008)); and the impact of our clothing on ecosystems (e.g., presence of petroleum/ perfluorinated compounds (PFCs), waste management).

While the SDGs provide useful over-arching guidelines, they remain arguably vague. More specific guidelines associated with sustainable clothing are brand certifications, ecolabels, membership networks and rating systems. First, there are various regulations that outline the certification requirements of all brands imported in the European Economic Area (EEA) and aim to protect consumers through providing information about potentially hazardous chemicals in their clothing (Claudio, 2007). Some examples of such regulations are the Biocidal Products Regulation (BPR), Personal Protective Equipment (PPE), and the General Product Safety Directive (GPSD) (OTEXA, 2020).

Second, there has been a rise in "eco-fashion" certifications that respond to the conventional fashion industry (see Clancy et al., 2015). The International Standards Organization (ISO) defines eco-fashion as "identifying the general environmental performance of a product within a product group based on its whole life cycle in order to contribute to improvements in key environmental measures and to support sustainable consumption patterns" (Claudio, 2007, p. 453). Reports such as *An Overview of Ecolabels and Sustainability Certifications in the Global Marketplace* (Golden et al., 2017), have attempted to de-mystify the often bewildering landscape of consumer guidance, by charting the various eco-labels and certifications.

Eco-labelling is still not widespread when it comes to clothing, and most labels only communicate the production country and materials used. For the textile and apparel industry, there are at least 60 labels that could apply. Further, the communicated information varies in specificity. While there are some overlaps between different labels, they largely focus on different areas

of sustainability. Thus, there is not one label that covers the full spectrum of sustainability information (Turunen & Halme, 2021). Besides, clothing companies are not required to comply with any eco-labels or certifications and may only do so as a matter of business strategy (Davidson, 2019).

Crucially, however, eco-labels and certifications require regular third-party verification to ensure corporate accountability, which increases the reliability of these labels. The Global Organic Textile Standard (GOTS) is the world's leading textile processing standard for organic fibers (Global Standard, 2016), while the Nordic Swan Ecolabel is the official ecolabel in all the Nordic countries, the EU Ecolabel is the official eco-label in the EU / EEA.

Other indicators of credibility come in the form of membership networks and rating systems, which largely rely on self-reporting and are thus regarded as less trustworthy (Davidson, 2019). Some companies use social media channels to convey pro-sustainability information about their products, but this may serve to confuse, rather than educate, potential consumers (Turunen & Halme, 2021). Turunen & Halme assert that neither certifications nor free-form communication entirely respond "to the need for actionable sustainability information for purposes of consumer decision-making" (p. 3). Lack of transparency, then, remains a barrier to making well-considered consumer choices.

Carrone (2020) argues that, within SDG 12, target 12.8 specifically highlights the importance of people having relevant information about the origin, production and composition of products so they may develop more sustainable lifestyles. Traceability and transparency across the supply chain systems are essential to ensuring that products meet the sustainability-minded consumers, and the accessibility and clarity of this information plays a central role in translating sustainability guidelines into action (Carrone, 2020; Joy & Peña, 2017). Although changes must happen on more macro and political levels, individuals should be recognized and engaged as agents of change and influence (O'Brien, 2018) who can develop the competences necessary to contribute to sustainability through pro-environmental actions (Sinnes, 2020). Yet, in the absence of over-arching, universal standards, it is challenging for consumers to make sustainable choices when buying outdoor clothing.

In response to the above problems, both governmental institutions dealing with consumer rights and information, and organizations concerned with environmental issues, provide a wide range of guidelines. However, these are usually quite broad and ambiguous—not unlike the SDGs described earlier. For example, some advice includes using clothing for a long time, buying clothing of high quality, trying "care and repair", buying from companies that commit to fair working conditions, and looking for eco-labels (Forbrukerrådet, 2017; O´Malley, 2019; WRAP, 2017; Webb, 2016). Surprisingly, few agencies suggest buying less or not at all (Future in Our Hands, 2020).

In short, on the one hand, global interest in sustainability has led to the development of a set of wide-ranging standards, regulations and certifications.

On the other hand, the quantity and diversity of these can make it difficult for consumers to distinguish between which certifications are the most comprehensive and trustworthy, and which are not (Gustafsson & Hallström, 2013). The lack of traceability, transparency and practical guidelines pose a barrier to the consumer's ability to make well-considered purchasing choices (Joy & Peña, 2017).

Some scholars assert that outdoor education, in particular, can be linked to increases in environmental consciousness or with more environmentally responsible behavior (Martin, 2004; Williams & Chawla, 2015). Nevertheless, Høyem (2020) asserts that proenvironmental behavior is driven by reflection on the relationship between humans and nature, and that outdoor recreation alone does not necessarily promote this reflection. As professional outdoor educators, it is important to be sensitive to the kinds of values we communicate through our practices, as we are often regarded as role models for our students and for the members of the public we encounter (Eriksen, 2019). Through this inquiry, we aim to outline a set of principles that can help guide ourselves, our students, outdoor recreation providers, environmental education programs, and other outdoor enthusiasts, with making more informed sustainable purchases in the future.

Methodology

The Outdoor Studies team's jacket buying discussions started in the late autumn of 2017. After more than two years of this being raised as an item at staff meetings, we had yet to arrive at a decision. In November of 2019, after a discussion on why certain jackets were suitable and others were not, we accepted that we were at an impasse. We didn't just want a shiny new shell jacket; we aspired to buy a functional garment that could be considered sustainable in several senses of the word.

We wanted to use our debates around our own values and assumptions around purchasing material goods as data. These data and the way they were interpreted would then be more easily scrutinized by ourselves and by others. Afterall, it should be possible for any consumer in the public domain to make highly informed, ethical choices about how they spend their money. Findings extracted from these debates would not, however, be an end in themselves; rather key themes would enable us to enter more enlightened and focused discussions which would directly inform material purchases of all kinds that we make as individuals and as an organization.

It was decided to employ a practitioner inquiry research design. Menter and colleagues (2011) explain how a practitioner inquiry (PI) is undertaken within the practitioner's context and allows educators to become agents of their own learning by investigating practice within their institutions. Cochran-Smith and Lytle's (1993) description of the "systematic, intentional study" (p. 23) of

one's own practice would become our project's central tenet. While practitioner inquiry is commonly associated with teachers working in schools (see Cochran-Smith & Lytle, 1993; Anderson et al., 1994), Hall (Sage, n.d) explains that this methodology is "about the practitioner, whether they're a teacher, a lawyer, a doctor, or a social worker, thinking about their work in a curious, but also a very systematic way" (0.29s - 0.38s). Our literature searches did not reveal other studies in the fields of environmental education and outdoor recreation that had employed a PI research design to explore issues of sustainability; this study thus enters novel methodological ground in these fields.

Galosy (2014) notes that it takes a certain "courage and humility to ask, 'What's going on here?', rather than jump immediately to judgment or action" (para 7), and we have attempted to embrace that rather tricky terrain of researching ourselves as we tackled a topic that does not admit clarity, nor well-defined boundaries. Central to practitioner inquiry is that participants critically and methodically question their own work as a means of improving practice. This involves gathering data related to these practices, analyzing them, and sharing findings with others (Dana & Yendol-Hoppey, 2014). Within PI, practitioners are viewed as "knower and agent for educational and social change" (Cochran-Smith & Lytle, 2009, p. 37). Following Levitt and colleagues (2018), our inquiry was situated in both the "context of the investigators" (our relation to the topic) and the "context within which a phenomenon or study topic is being construed" (the specific time and place) (p. 29).

The PI approach harkens back to Denzin and Lincoln's (2000) notion of the *bricoleur,* who uses whatever materials, strategies, and methods are at hand to piece together a representation of a complex situation. Following Miles and Huberman (1994), our inquiry became more of a "craft" than the "slavish adherence to methodological rules" (p. 5) that might limit our capacity as inquirers. What is clear is that this study is firmly positioned within an interpretivist / constructivist philosophical paradigm, as it seeks to understand, interpret and describe (Lincoln et al., 2011; Merriam & Tisdell, 2016).

In their 2009 book, Cochran-Smith and Lytle outline eight features that underpin practitioner inquiry, and here we briefly highlight them, as they resonate so strongly with our investigation. First, the practitioners—in this case, us authors, who work in a university setting—simultaneously take on the role of researchers. Second, collaboration is central as "inquiry communities" work together to "interrogate the assumptions and values that underlie their practices" (p. 41). Third, all participants in the inquiry are regarded as knowers and learners. Fourth, the workplace (or professional context) is the principal site of the inquiry, and it is the problems within that context that become the root of it. The fifth feature is closely related to the first, in that the boundaries between the inquiry and practice are somewhat blurred. Sixth is systematicity, and this refers to the way data is gathered from a variety of sources to permit multiple perspectives to be understood, and to possibly reveal how these

perspectives may have shifted over time. Seventh is sharing findings with others and being open to critique from them. The final feature has to do with validity and generalizability and is discussed below.

Like any methodology, practitioner inquiry, is not without its weaknesses. Practitioner inquiry has been accused of being "consequential but invisible, except to its immediate participants" (Cochran-Smith & Lytle, 1993, p. 7); this bleeds into the principal critique that PI research is so idiosyncratic that it does not permit generalization and application to other contexts (Wilson et al., 2001). We have the opposite in mind, however, as we aim to arrive at guidelines for purchasing the most sustainable jacket as possible, which organizations and individuals can adopt and adapt for themselves.

Methods for Data Collection And Analysis

It is not possible to separate explanations of data collection and data analysis, as there was not a period of one followed by the other. There were multiple instances of data collection and analysis, and these ended up forming a kind of cycle, where the findings from one set of data would directly inform the next round of data that was generated through our discussions and written tasks. This cycle resonates strongly with the "hermeneutic circle" (Bontekoe, 1996), that "involves repeatedly and cyclically moving between the parts or aspects of the phenomenon and the whole, with the objective of gaining a growing understanding of the phenomenon" (Paterson & Higgs, 2005, p. 345).

Practitioner inquiry is an extension of action research (Reason & Brandbury, 2001), and our process has similarities with the circular dimension of the action research spiral (Coghlan & Brannick, 2005). Applied systematically, this helped us move deliberately through four cycles of data generation and analysis. Experience with this cyclical work has shown that it is important to refine questions and acquire and develop knowledge for each round (Høyem, 2012).

This iterative process featured data collected from four group discussions, the thematic analysis conducted on each discussion, and the findings used to inform the subsequent discussion. These meetings were audio-recorded and uploaded to a shared site on our local server. One document was created for each recorded discussion, where all eight researchers could write down their reflections on the recordings and ongoing interpretations of them.

During the first meeting, we tried to recapitulate the last two years of discussion (2017– 2019). Three members then performed a thematic analysis of this session, which informed the second discussion. During this meeting we discussed what unspoken messages our choices of outdoor clothing send to students, other colleagues, and members of the public.

Discussion three took place a month later. Even though three of the eight staff were missing, everyone was able to read the notes and listen to the audio recordings from that meeting. These notes featured our first attempts to

categorize features of a jacket that were important to us. Ecological and human factors were two categories and another was kept open, where members could add factors that had not been raised in earlier meetings, while also adding written arguments for and against each factor, based on theoretical and practical knowledge. Six out of eight staff members completed this last task. During the fourth meeting, we discussed the categories and themes within the table we had created. It was at this meeting, where the final four factors were decided-upon.

Data Verification

All members of the Outdoor Studies team had opportunities to read and comment on drafts throughout the process, thus increasing the trustworthiness, credibility, and dependability (Denzin & Lincoln, 2000) of our findings. Cochran-Smith & Lytle (2009) follow this qualitative, interpretive tradition and posit that "validity rests on concrete examples (or 'exemplars') of actual practice presented in enough detail that the relevant community can judge trustworthiness and usefulness" (p. 43).

Two members of the team took the lead through the cyclical stages of data generation, analysis, and management. To highlight points that might have been missed in earlier stages, the same two listened to all the recordings again and read through all of the meeting notes (and the comments on them). This kind of peer review arrangement afforded the process a certain consistency and built-in investigator triangulation, in terms of agreeing on key themes that had arisen (Merriam & Tisdell, 2016). Indeed, the iterative nature of the data generation and analysis spiral permitted us to arrive at findings which we have deemed to be trustworthy.

Ethics

There are eight authors of this paper. All members had access to the data and to this manuscript. The project was informed by guidelines from the British Educational Research Association (2011) and paid particular attention to ensuring that individuals were not identifiable through the manuscript; data were kept securely on a OneDrive folder that was only accessible to the authors; and contributors had the right to withdraw at any time, without penalty. Since the data was collected solely by and on the eight co-authors themselves, ethical approval from The Norwegian Centre for Research Data was not sought.

Generalizability

Stake (2000) argues that most academic researchers expect a certain degree of generalizability to other cases. Further, it has been argued that the key to generalization rests with the reader of the research report and not the

researcher (Kennedy, 1979; Taber, 2010). In this sense, the onus is on the reader to extract points that they judge to be useful to their own practice and "permit readers to draw the necessary comparisons to their own contexts of interest" (American Educational Research Association, 2006, p. 39). It is our firm hope that readers will be able to use our findings to inform their practices around outdoor clothing and equipment procurement specifically, and their individual and organizational ethos', more generally.

Findings

The analysis of data yielded four principal sustainability-related factors that would inform our purchasing: durability, ecologically friendly production practices, fair labour conditions, and associated social and political reasons. They are presented in order of their relative dominance, in terms of how often they were mentioned in the data. These four factors, which can inform what one buys, assume, of course, that one requires a jacket in the first place. Ultimately, we wanted our guidelines to help us make decisions about purchasing outdoor clothing and equipment more generally – but crucially, only if and when specific items were needed.

Before turning to the four factors, it is important to highlight a key underlying assumption within our discussions: function. Indeed, the importance of the garment's function was nearly over-looked in our early discussions. We were initially so pre-occupied with the ecological and socio-cultural influences of jacket manufacturing, that we failed to consider what type of jacket would serve the purpose, in terms of fit, features, and waterproofness, and so on. Ultimately, we decided there was no point in discussing the sustainability features of a jacket that we would never buy because it was not fit for purpose. Function will be elaborated on in the Discussion section.

Durability and Repairability

The first and most important factor identified by the staff team is the extent to which the material is durable and reparable. This can be considered in three ways. First, the material itself needs to be strong enough that it does not tear or puncture too easily from foreseeable wear on the trail or in camp. Second, the material needs to be renewable, in the sense that it can be re-treated to regain its waterproofness. We did not want a jacket that beaded water for the first year and then lost its capacity to protect the wearer as time went on. And third, we wanted a jacket made from material that could be repaired in a way that did not lessen its integrity as a waterproof and breathable layer, and which enabled it to have as long a working life as possible. Some manufacturers of outdoor clothing guarantee the longevity of the garment, and repair clothes that break at no extra cost. Perhaps selfevidently, durable items do not have to be replaced as often.

Physical durability can, in a technical sense, be described as the physical lifespan of garments; it includes both its strength and how it is cared for. *Social durability* refers to garments that can be used over a long period of time and still be appreciated or valued in social circles (Klepp et. al., 2020). Thus, designing for durability seeks to "improve physical and technical robustness of garments in addition to addressing the emotional and expressive qualities they can provide for consumers" (Laitala & Boks, 2012, p. 127), while leading to extended use and longer functioning cycle. Laitala & Klepp (2013) assert that almost no clothing includes information about lifespan expectancy, and hence consumers base their evaluation of durability mainly on clues that do not directly reflect it, such as price or brand name. Perceived quality is also guided by personal experience and independent consumer reports (Aakko & Niinimäki, 2021).

Ecologically Friendly Production

In our early discussions on environmental sustainability, we found it challenging to subdivide this category into more specific indicators, as we lacked the knowledge to separate the overlapping features they shared. We initially identified seven indicators under the umbrella term of 'environmental sustainability': first, carbon emissions from transporting materials – either as a part of, or after the, manufacturing process and all the way to the users; second, the degree to which recyclable and reusable materials are used in the manufacturing process; third, pollution and carbon emissions from extracting raw materials, and from manufacturing and packaging the product; fourth, the amount of petroleum, PFCs (per- and poly-fluorinated chemicals), other chemicals and microplastics in the materials; fifth, the influence on habitat and biodiversity in the extraction and manufacturing stages; sixth, the type and amount of energy used in the production; and finally, waste management. These indicators are inseparable as a basis for making practical choices, and so must be considered as a whole.

It is near impossible for an average consumer to access and then collate the information about the above seven indicators: the amount of time, investigative work, and data synthesis skills required is enormous. Thus, what becomes most important are the externally-conferred assurances of environmental sustainability that companies provide consumers. Examples of these assurances are the Global Organic Textile Standard (GOTS) (Global Standard, 2016), which defines environmental criteria along the entire supply chain; the Bluesign (2020), which is an eco-label for the sustainable production of textiles with strict requirements for chemical use and emissions throughout the production chain; and the EU Eco-label ("the flower"), which is awarded to products and services meeting high environmental standards throughout their life cycle (European Commission, 2020). Other labels may show that the raw material production is certified, but they cannot do the same for the entire production process.

Fair Labour Conditions

Labour conditions at factories and sites of extraction is listed as the third feature to inform our purchasing. This theme can be described as "what life looks like" in the factory, who is working there, and what wages they earn in relation to the cost of living. More broadly, these factors encompass the degree to which production of the goods contributes towards a balanced economy and stabilized communities, the factory's influence on local culture, and the preservation of human rights in the production country. As with the above theme of environmental sustainability, consumers need to rely on third part certifications of socially just conditions of manufacturing. Again, the Global Organic Textile Standard (2016) demands compliance with the criterion of social sustainability as described above, and Bluesign (2020) provides assurances of care being taken to minimize the impact of the production chain on the well-being of the local people through, among other things, focusing on occupational health and safety of workers.

Socio-Political Reasons

For our staff team, the fourth and final factor when considering which jacket to buy has to do with the social and political reasons that might influence why we choose to buy—or not buy—from a certain company. This could involve indirectly supporting or rejecting specific communities or political interests. Examples of this might be wanting to support a smaller, start-up enterprise from an economically-deprived area, or giving our business to a company that donates a percentage of its profits to a political cause we deem important.

Finally, the theme of the cost of the jacket is perhaps notable by its absence. A final decision will depend on the classic "price versus values" duality, and our willingness to pay for function, durability and sustainability. Overall, the team's shared sentiment was that we would initially focus on determining the best jacket to buy, as informed by the research on ourselves and the information available in the public domain.

Discussion of Findings

Dennis Soron (2010) claims that our habits of consumption are intertwined with our identities, values, emotions, and social influences. This view is not lost on our staff team, as the jacket we choose will ultimately be a kind of public ethical statement. Our initial meeting revealed themes that were strongly related to identity, as what we buy sends certain messages about who we are – or at least who we want others to think we are (Goffman, 1959; Gomez et al., 2015). For instance, "buying used gear may be a way of signaling oneself as an ethical consumer" (Nagle & Vidon, 2021, p. 1263). These meetings also led to

discussions about values, which may be very personal and diverse within a group of people. As the inquiry progressed, we came to see that our debates on identity and values needed to be more grounded in science, and how this knowledge was "managed" and explained to consumers in the Northern leisure market.

Critics might accuse us of green consumption, as we look to purchase "conscience soothing" apparel. This is partly fair, as we do possess the affluence needed to make choices about what we buy. Indeed, the UN's Sustainable Development Goal 12 (2015) encourages us to use our "old" products until they absolutely must be replaced, rather than accumulating more products that have been deemed "environmentally friendly". This ethos resonates strongly with the Outdoor Studies team's most important feature of a jacket: durability and reparability.

Turunen & Halme (2021) suggest a "Shades of Green instrument" (SoG) to assist consumers with their decision-making by "providing a set of key sustainability issues over the product's life cycle" (p. 1), but this needs to be further developed and has yet to be researched. Scales such as the SoG might better speak to our need for assurances on environmental sustainability and fair labour conditions, and perhaps to some underlying socio-political motivators, as well. Klepp and colleagues (2020) recommend comparing the environmental impact of apparel through a method called "life cycle analysis" (LCA), which features clearer indicators of a garment's actual lifespan that are derived from "key data relating actual garment use", and from information about its fibre content (Laitala, Klepp & Henry, 2017). It is also paradoxical that the promotion of sustainability through labelling is often used to sell more (Sinnes, 2020). For instance, some companies selling outdoor gear claim to fight for the environment by using durability as a marketing strategy; this, of course, only encourages more consumption (Nagle & Vidon, 2021).

A large revelation of the seven-month data generation and analysis process came in the fourth and final group meeting. During a debate about the relative importance of various factors under the umbrella of environmental sustainability (e.g., loss of habitat vs. using petroleum-based products), we realized that, as members of the public, we could never come remotely close to adequately investigating and understanding the extent to which these elements featured in the manufacture of a given jacket. It was at this point that we saw that what consumers needed was assurances that certain measures were being taken by the company to, for example, only use recycled materials and have their factory workers paid a fair wage. This assurance of ecologically friendly manufacturing was, however, linked very closely to our third factor, which was assurances of fair labour conditions.

Realizing how incomplete our knowledge will ever be when it comes to understanding all aspects influencing the sustainability of an outdoor shell jacket – or anything else – we arrived at the concept of *supply chain transparency* as a way of explaining the processes at work. Mol (2015) describes how transparency

comes in different forms and has the aim of providing “information on the sustainability of production processes and product characteristics is disclosed in the wider public domain” (p. 156). An example of this is the Fashion Transparency Index (Fashion Revolution, 2020).

We somewhat naively believed that supply chain transparency could be an objective guide to our choices regarding the reductionist categories of environmental and human factors influencing what can be considered sustainable. Indeed, Mol (2015) warns that supply chain transparency in practice has many shortcomings, such as how the information is used and by whom. It follows that existing eco-labels, like the ones presented earlier, may also not to be enough to enable consumers to make sustainable choices when buying an outdoor mountain jacket. This aligns with a recent paper outlining the pitfalls of relying exclusively on eco-labels which asserts that accountable and verifiable data are seldom available (Klepp & Tobiasson, 2020). In addition, Turunen & Halme (2021) explain how most eco-labels are based on a binary logic, and thus offer no scale to differentiate between the relative sustainability of products. The authors also highlight how brands, not products, are the units of evaluation in eco-labelling, and hence are difficult to incorporate into actual consumer choices. However imperfect they may be, eco-labels, like GOTS, the EU eco-label and Bluesign, do bring a certain degree of useful information with them. Still, this information is limited in its usefulness.

Our fourth factor of socio-political motivators features a multitude of key factors that may cause consumers to choose articles with similar durability and eco-certifications over one another. While a certain amount of this may be subjective, the literature highlights a number of factors that can be considered. The list of arguments for choosing to directly support certain companies that very publicly locate their businesses within a larger social improvement enterprise, includes the positive relationship between smaller, local firms and, a) lower wage inequality (Mueller et al., 2015); b) recirculating money into the local economy (Civic Economics, 2013); maintaining a higher proportion of their employees during economic downturns (Moscarini & Postel-Vinay, 2012); d) higher income growth and lower levels of poverty (Fleming & Goetz, 2011), and e) increased social capital, civic engagement, and well-being (Blanchard et al., 2011). Issues of social justice are playing an increasingly important role in all our consumption choices.

As outdoor professionals, we believe we have an elevated awareness of our own motivations for outdoor experiences, along with a high degree of reflection on our own relationships with nature. It follows that we have a certain potential to develop intentions to act in environmentally responsible ways (Høyem, 2020). However, knowledge of a problem does not necessarily lead to that problem being addressed (Stoknes, 2014; Ojala, 2017), and intentions do not necessarily lead to actions (Stern, 2000). This difference between what people say and what they do has been labelled the *attitude-behaviour gap* (Tilley, 1999)

and is increasingly being used to explain people's inadequate adoption of more pro-environmental behaviour (Juvan & Dolnicar, 2014). While this may seem straightforward, actions to live more sustainability are often limited by people (usually of privilege) who are unwilling to let go of their patterns of consumption (Soron, 2010).

Soron (2010) explains that the reason for consumption patterns being so hard to change is that they are located within non-rational values, emotions, and socio-cultural influences. Still, there are arguments for deliberately making visible the measures that are taken to solve the challenges we face (Chawla & Derr, 2012; Ojala, 2017), both to provide hope that action is being taken and to give examples of what one can do oneself. This text can stand as an example of trying to make actions visible. In line with this position, we call for clearer, more transparent, and more accessible guidelines for consumers to be able to make betterinformed purchases.

Conclusions and Implications

This inquiry posed four research questions. First, what did our staff team determine to be the key factors of sustainable consumption when purchasing an outdoor jacket? Second, how does the available guidance literature relate to our factors? Third, how can these factors contribute to developing clearer guidelines for buying outdoor clothing and equipment more generally? And fourth, how can this knowledge actively shape approaches to teaching and learning in the fields of outdoor education and recreation?

Beames, Mackie and Atencio (2019) remind us to consider the "environmental and humanitarian impacts" (p. 184) of our adventure practices, but this is much easier said than done. What initially seemed like a simple task of choosing a mountain jacket for the university outdoor studies staff team, became a long journey into a complex rabbit hole, from which we are emerging after three years of discussions. While research reports are often presented in a linear, logical fashion, the reality is usually the opposite. Indeed, our journey featured winding roads, bumpy sections and dead ends. Choosing a jacket became a first world problem, due to the privilege inherent in us having the means to buy the jacket we desired and by this conundrum being regarded a problem in the first place.

We recognize that outdoor practices are "part of an economic system that includes global chains of production and consumption with social and ecological consequences" (Simon & Alagona, 2009, p. 19), and accept the duty that comes with being visible leaders in the sector. The four considerations at which we arrived are admittedly imperfect and will continue to evolve over time, as the eco-labelling processes become more rigorous, and we educate ourselves further.

Judging how sustainable a product is can be a complex and time-consuming process (Sinnes, 2020). The certification schemes are made to help consumers,

but we have found their differences in focus, scope and demands to the supply chain, as challenging to interpret and employ as we attempt to make informed choices. In and of themselves, the eco-labels and certifications do not provide enough information for most consumers to use with any kind of ease: their data sources vary greatly; they do not offer adequately nuanced degrees of sustainability for the products they endorse; they overlap greatly; are not completely comprehensive; and there are too many of them. It is also paradoxical that the promotion of sustainability through labelling is often used to sell more (Sinnes, 2020). For instance, some companies selling outdoor gear claim to fight for the environment by using durability as a marketing strategy to encourage even more consumption (Nagle & Vidon, 2021). Klepp and Tobiasson (2020) further explain that there remains "a terribly annoying fly in this soup" (para 18), which is the poor, outdated, and unverifiable data that is used in many green clothing indexes. This leaves consumers like our outdoor studies team with a challenge that becomes increasingly centered around which eco-labels to trust, rather than which jacket to choose.

A conversation that began rather naively turned into an extended series of discussions that exposed the difficulties associated with making "nature friendly" and "human friendly" choices about buying material goods of all kinds. Ultimately, the process that we went through was much more than deciding on what shiny new outdoor jacket we should buy. The jacket discussion was a way into the sustainability matrix: it represented a simple, fixed marker in a world full of sustainability ambiguity – a concrete foil against which we could test our beliefs, values, and assumptions, and through which we would increase our individual and collective knowledge about how we can make consumer choices in a more responsible manner.

Since the eight authors of this paper teach university students, this study also yields a central implication for practice that is pedagogical. We regard the literature review, the eco-label research, the PI process, and the four factors at which we arrived, to be vital discussion points with students. Teaching and learning that is grounded in authentic learning contexts can be highly engaging and powerful (Beames & Brown, 2016). Thus, critical reflection, discussion and debate with our students – whether in class, online or outdoors – about how we can be more deliberate in our re-using, re-making and purchasing practices will be deliberately incorporated into our teaching. The ground is also laid for further conversations in our coursework to encourage students to become leaders within their own communities. They can then join a growing body of educators and guides who are advocating for increasing the transparency of environmental sustainability and fair labour practices within the domains of outdoor clothing and equipment manufacturing, while strengthening the clarity and validity of eco-labelling schemes.

This inquiry adopted what could be termed an applied view of sustainability, as it focused on developing "a set of guiding criteria for human

action" (Salas-Zapata, & OrtizMuñoz, 2019, p. 153) that is located within a larger social-ecological system (p. 155). These guiding criteria were arrived at through a "systematic process by which we know more about something than we did before engaging in the process" (Merriam & Tisdell, 2016, p. 5). While our findings may not be especially surprising to readers, it is important to remember that they were arrived at through a systematic and rigorous process. Further, these findings represent a contribution to a body of knowledge on sustainability education practices that is short on empirically-driven pedagogical guidance.

While practitioner inquiry has a history in educational studies, this approach to conducting in outdoor education and recreation has seen little attention. We would argue that the fields of environmental education and outdoor recreation are already full of the kinds of rich "inquiry communities" that are so integral to PI. It may be that these communities need to become more formalized in ways that better equip them to "foster deep intellectual discourse about critical issues" and thus "function as grist for new insights and new ways to theorize practice" (Cochran-Smith & Lytle, 2009, p. 37). Viewed this way, this paper's contribution to the field is methodogical, as well as practical and conceptual.

After asking ourselves whether or not we need to buy a given piece of technical clothing or equipment, if the answer is "yes", we have four aspects to consider: the item's durability, the assurance of sound ecological practices, the assurance of fair human / labour practices, and relevant socio-political factors. These four considerations can be used to guide an outdoor organization's procurement of clothing and equipment, while at the same time assist individual consumers in making more informed purchases – or perhaps not purchasing at all. In most cases, eco-labels and certifications are the simplest ways for consumers to be assured of ecologically and socially practices used by clothing companies. This then shifts the conversation to determining which are the most trustworthy eco-labels, which, as we have seen, is complicated. Even the most credible eco-label, however, will not help us when it comes to determining an item's durability or associated socio-political factors. We encourage others to adapt, develop and refine these four considerations for their own application, and to ask friends, colleagues, and inquiry communities, tough, pointed questions about their consumption habits.

We plan to share the ongoing story of our journey towards becoming more responsible consumers of outdoor products, and more sustainability-minded outdoor course providers, through forthcoming knowledge exchange events. Visit the Outdoor Studies Forum webpages at the Norwegian School of Sport Sciences for more information: https://www.nih.no/en/research/about/departments/teacher-education-and-outdoorstudies/outdoor-studies-forum/

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The *Thalweg* of Currents: Naturalist Environmental Education

Douglas D. Karrow, Brock University & Sharon Harvey, Arizona State University

Abstract
This paper aims to (re)consider environmental education (EE) through the lens of a mystery/knowledge continuum. It revisits the currents of EE identified by Lucie Sauvé and juxtaposes these with a typology of the senses of mystery. Philosophically and theoretically informed, the paper concludes that a naturalist current *of EE optimally invokes a* skeptical-sacred *sense of mystery, where knowledge is in relation to mystery. A naturalistic current of EE offers a distinct way of considering reality, which has implications for EE and its constituents:* thinking, pedagogy, learning, and curriculum. *Of Sauvé's fifteen established currents of EE, we argue that a naturalist current could serve as the* thalweg, *or valley-way, of currents of EE for metaphoric, etymological, philosophical (epistemological and ontological), and educational reasons.*

Résumé
La visée du présent article est de (re)considérer l'éducation à l'environnement sous l'angle d'un continuum entre mystère et connaissance. Il revisite les courants de l'éducation à l'environnement définis par Lucie Sauvé et les juxtapose à une typologie des sens du mystère. En s'appuyant sur des ouvrages philosophiques et théoriques, l'article conclut que le courant naturaliste permet d'établir un rapport optimal entre mystère et connaissance, un sens du mystère sceptique-sacré. Le courant naturaliste et sa façon distincte d'analyser la réalité peuvent façonner l'éducation à l'environnement et ses composantes (pensée, pédagogie, apprentissage et programme d'études) de façon à développer cette perception chez l'apprenant. Parmi les quinze courants définis par Sauvé, nous retenons le courant naturaliste comme le thalweg, ou chemin de la vallée, d'une éducation à l'environnement fondée sur un raisonnement métaphorique, étymologique, philosophique (épistémologique et ontologique) et éducatif.

Mots-clés : éducation à l'environnement, mystère et connaissance, sens du mystère sceptique-sacré, courant naturaliste, pensée, pédagogie, apprentissage, programmes d'études

Keywords*:* environmental education, knowledge/mystery, skeptical-sacred sense of mystery, naturalist current, thinking, pedagogy, learning, curriculum.

The *Thalweg* of Currents: Naturalist Environmental Education

In our phenomenology of knowing (Karrow & Harvey, 2015; Karrow, 2010) we explored the relationship between what we "know" and what we "don't know". In that work, we refer to what we "don't know" (i.e, the unknown) as *mystery* and what we "know" as *knowledge*. The authors acknowledge this is an oversimplification of the relationship on the mystery/knowledge continuum and that in certain cultures/ethnicities what counts as knowledge may be labelled by others as mystery, and vice versa. We position ourselves as Western scholars actively learning about other cultural/ethnic senses of mystery (McKinley & Smith, 2020; Mika et al., 2018, Mika, 2017, 2015) that may be labelled in the West as "mystery," when they are, in fact, other forms of knowledge (e.g., spiritual, intuitive, etc.) (Karrow & Harvey, 2021). Furthermore, our explorations have revealed intimate, complex, and mutually sustaining relationships between knowledge in relation to mystery: "mystery is the constancy of departure; knowledge the approximation of arrival" (Karrow, 2010, p. 164). This primordial[1] relationship between mystery/knowledge accommodates a "wider frame of reference for mystery within other cultures/traditions" (Karrow & Harvey, 2021, p. 14). As such, it would be fair to conclude that a particular view of knowledge (e.g., scientific) might result in a particular sense of mystery (denied). This was a major finding of our previous work (Harvey & Karrow, 2016; Karrow & Harvey, 2015; Karrow & Harvey, 2021). The purpose of this paper is to (re)consider environmental education (EE) through the lens of a mystery/knowledge continuum. In doing so, it brings to the fore certain philosophies of reality (e.g., naturalism or absolutism). We argue such philosophies of reality, and their relationship within the context of EE, have remained largely tacit. By bringing conscious attention to one's philosophy of reality through the mystery/knowledge continuum, we propose that a (re)consideration of EE is possible by way of revisiting the currents of EE, as identified by Luci Sauvé (2005), and juxtaposing these with our typology of the senses of mystery (Karrow & Harvey, 2015). Following this introduction, we provide a summary of our philosophical orientation and major theoretical influences. We then move on to explore four specific objectives circumscribed by our work: (a) a literature review on the topic of mystery and its relationship with knowledge as well as the development of our typology of senses of mystery [herein mystery typology]; (b) a mapping of the currents of EE[2] (Sauvé, 2005) onto our mystery typology (Karrow & Harvey, 2015) (Figure 1); (c) an interpretive analysis of the naturalist current of EE and why might it serve as the foundation for other currents of EE; and (d) a discussion of the implications this may have for (re)considering EE, with a focus on the general aims of education and their constituents: *thinking, pedagogy*, *learning,* and *curriculum* (Schwab, 1978).[3] We conclude with a summary highlighting our findings, while anticipating avenues for future research.

Philosophical Orientation and Theoretical Perspectives

Although primarily inspired by Heidegger's thinking (1953/2000; 1966; 1927/1962), this paper is broadly influenced by the philosophies of metaphysics, science, and theology, as well as their longstanding relationship with the domains of mystery and knowledge. An extensive literature review of the relationship between mystery and education (Karrow & Harvey, 2015) confirms Lyotard's (1979) hypothesis of the postmodern paradigm, that the status of knowledge alters as societies evolve.

As societies evolve, so too do their views of mystery/knowledge. For instance, during pre-modern times (ancient–1650s) knowledge of the world was frequently vested in the authority of a deity, that ultimate truth could be known, and that this truth could be arrived at through revelation. As accepted interpretation of divine knowledge, theology revealed this knowledge to would-be subjects predisposed to revelation. In contrast, during modern times (1650s –-1950s), political and educational institutions (i.e., governments and universities) asserted authority over knowledge. Theology became subordinate to these social institutions. Empirical knowledge, established through the senses (i.e., modern science, and the philosophy of reason or logic) was epistemologically favoured. Truth came to be viewed as objective and verifiable. Postmodernity (1950s – present), has approached knowledge of the world as less hierarchical and more diffuse: knowledge presented by way of traditional authority, in addition to what constitutes truth, becomes circumspect. Epistemological diversity, through multiple ways of knowing—revelation, empiricism, reason and logic, intuition, spiritualism, relationality—is accepted. According to Lyotard (1979), toward the peak of postmodernity, knowledge *is* information, a commodity of exchange, and something rendered exterior through various technologies.

The history of knowledge, its sources and epistemologies, generally eschews mystery. What relationship, if any, does mystery share with knowledge? During pre-modern times, given that the source of knowledge was primarily theistic and epistemologically revelatory, knowledge encompassed a sacred and mystical quality. Knowledge associated with transcendence indicates that some other-worldly being beyond oneself is in "control," with the accompanying response of reverence and humility. Undeniably and inevitably, there is a spiritual relationship between any people and their world. Unless a divinity declares what is known, and what is not, what there is to know remains a mystery. Initially, humans experienced a more primordial relationship with mystery/knowledge. The two were undifferentiated during this pre-modern age. Taylor (2007) refers to such a period of undifferentiation as *disenchantment*.

> . . . the portrait of the world we have lost, one in which spiritual forces impinged on porous agents, in which the social was grounded in the sacred and secular time in higher times, a society moreover in which the play of structure and anti-structure was held in equilibrium; and this human drama unfolded within a cosmos. All of this has

> been dismantled and replaced by something quite different in the transformation we often roughly call disenchantment (p. 61).

In contrast, modern understandings of knowledge tend to exclude mystery, and mystery equated with the unknown and human ignorance: should a thing remain unknown this is often viewed with disdain, and analogous to a state of human ignorance. In such binary constructions, the unknown is commonly presaged upon the known at all costs, in an effort to vanquish ignorance.

In a final contrast, a postmodern understanding of knowledge sees it as a commodity of exchange, operating on a strict assumption of knowledge *as* information. There is minimal consideration of the unknown, let alone the status of human ignorance, as all knowledge can be accessed, purchased, or traded. Knowledge then is a "known" commodity, important in its availability, accessibility, transferability, and exchangeability (i.e., in today's parlance, "mobilization"). In effect, the dynamic between mystery/knowledge has been cleaved. Knowledge has been grasped and contained for the purposes of manipulation.

Against this historical backdrop, it is important to recognize there are certain philosophical positions on reality that frame our beliefs and attitudes toward knowledge and its relationship with mystery. In brief, reality can be viewed as a continuum framed by two idealist positions—*naturalism* and *absolutism* (Cooper, 2002). Along a continuum, at one extreme are naturalists, who believe humans are the sole conveyors of reality. Humans, in their various capacities, are viewed as capable of discerning structures of the natural world and making meaning from them. At the other end of the continuum are absolutists, who believe that humans only access a small fraction of the natural world. Despite small windows of meaning gleaned from these natural structures, humanity must console itself by coming to understand that there are limits to human structures that construct meaning, understanding and comprehension. To over-simplify, pre-modern times can be characterized by a tendency to favour theology, in a variety of historical forms (e.g., pantheism, polytheism, and multiple versions of monotheism) as a realm of experience to function as the sense-making structure. Theology's diverse forms helped humanity navigate its relationship with the natural world (e.g., natural disasters in premodern times could understood as acts of god(s)) (Cornfield, 2018).

As previously noted, mystery/knowledge were largely undifferentiated during premodern periods. Developments within philosophy, and subsequently science, defined knowledge as a product of quantifiable experience, which led to knowledge and mystery becoming clearly differentiated. A net tendency to marginalize mystery for the sake of knowledge emerged (for instance, a natural disaster during modern times, as cited above, can now be understood as a meteorological or climate phenomenon explicable through scientific investigation). With the advent of the postmodern, and the inevitable marginalization of mystery by knowledge *as* information, a somewhat ironic interest in reviving mystery in our lives appears to be developing (Cooper, 2002;

Heidegger, 1927/1962; Jones, 2009). This recognition of the role mystery plays in co-constituting reality is not dissimilar to the general project of deconstruction, where binary opposites are positioned in such a way that each is revealed as essential to the other's constituate meaning (Derrida, 1995). (Here again, invoking the example of the natural disaster above, there is the understanding that both the theological and scientific realms of experience can play a part in interpreting such phenomena). Currently, this can be seen playing out through Indigenous narratives *and* scientific theories, where both provide descriptions *and* explanations of climate change (Aikenhead, 2001; Fernández-Llamazares & Cabeza, 2022).

Typology of Senses of Mystery and Mapping EE Currents

Literature Review and Development of the Typology

Our work leading up to the development and presentation of our mystery typology began several years ago. Initially interested in the topic of mystery and its relationship with knowledge, and how this might influence environmental education, we conducted a literature review on the topic.

An extended scan of the topic of mystery identified several key texts. Beginning with Bernard Verkamp's book, *The Senses of Mystery: Religious and Non-Religious,*(1997) we began to visualize a map of mystery's religious[4] and non-religious domains (henceforth the reader should read these as "spiritual" and "non-spiritual domains") (Figure 1).

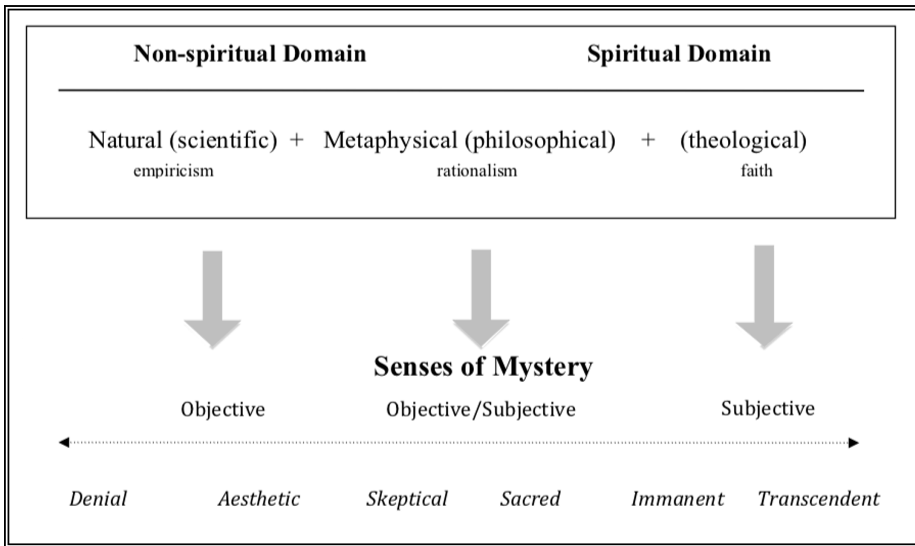

Figure 1. Typology of Senses of Mystery: Domains, Realms of Experience, and Senses of Mystery

Despite Verkamp's (1997) theological background and his proclivity to examine a [spiritual] sense of mystery in great detail, he does recognize a natural or [non-spiritual] sense of the term. Searching further, we discovered Richard Jones's (2009) work, *Curing the Philosopher's Disease: Reinstating Mystery in the Heart of Philosophy*. Jones outlines an argument re-instating traditional philosophy with the topic of mystery, examining how religion and science have largely marginalized its traditional role in the discussion of mystery. Jones helps confirm and extend Verkamp's (1997) spiritual and non-spiritual domains.

Lastly, during our initial foray into the topic, several colleagues recommended David Cooper's book, *The Measure of Things: Humanism, Humility, and Mystery* (2002). Cooper delves into mystery from a metaphysical perspective, meshing Eastern and Western traditions, as well as continental and analytical philosophies, together with past and contemporary traditions. He argues, mystery functions as the "measure of things" (p. 335) by successfully bridging absolutists' and humanists' contrasting claims of reality (which represent differing philosophical camps where it comes to explaining why things exist). But what is being measured?

> To measure our lives, then is to measure... both our comportments and our conceptions. Under the former bland term fall our purposeful activities and projects, and the evaluations, commitments, norms, moods, and sensibilities these typically register. Under the equally bland latter term fall the conepts we use to think and speak about the world, our empirical beliefs and wider 'world views'(p. 335).

Verkamp's (1997), Jones's (2009), and Cooper's (2002) texts help us develop our mystery typology (See Figure 1). We were able to use these works to strategize a more detailed and focused literature review using scientific, philosophic, and theological epistemes. This was useful in familiarizing ourselves with a complex terrain. Our preliminary review of these works allowed us to begin to map the scholarly terrain of mystery (see Figure 1). Non-spiritual and spiritual domains of mystery directly influence the senses of mystery we may experience in our lives as contemporary beings. The non-spiritual domain concerns itself with the natural or physical world (or "reality," per se). In contrast, the spiritual domain is concerned with things beyond reality. A non-spiritual domain of mystery can result in three distinct senses of mystery: mystery as *denied*, *aesthetic*, or *skeptical* (see Figure 1), whereas the spiritual domain of mystery results in *sacred, immanent,* and *transcendent* senses of mystery (Verkamp, 1997; Jones, 2009). We summarize each set of the three senses of mystery in this order: first, those derived from a non-spiritual domain, and second, those resulting from a spiritual domain.

Moreover, Jones's (2009) work helped us identify the epistemes at play in non-spiritual and spiritucal domains of mystery. We were able to relate domains of mystery with epistemes, what we refer to as "realms of experiences". Regarding the respective histories of philosophy, theology, and science, it became evident that mystery can be experienced through these realms of experience. Referring

to Figure 1, the non-spiritual and spiritual domains can be subdivided into broad natural (scientific), metaphysical (philosophical), and spiritual (theological) realms of experience. Suggested here is a continuum of experience where the natural can become metaphysical, and in turn, the metaphysical can become theological, as well as alternative constuctions. As such, they are not discrete categories, per se; nor is the movement implied to take place from left to right, or in reverse, along the continuum.[5]

Non-spiritual Domain and the Senses of Mystery

A non-spiritual domain may result in a sense of mystery as *denied*. This sense of mystery represents one extreme position along a spectrum of senses of mystery. As the name implies, this sense of mystery is one that "denies mystery." Rooted in the enlightenment, the disciplines of modern philosophy and empirical science, efforts directed toward understanding reality, were compelled to eradicate mystery. Mysteries came to be viewed as problems that could, given enough time, be solved either through rationalism or empiricism.

A second possible sense of mystery derived within the non-spiritual domain is that of an *aesthetic* sense of mystery. While still rooted in rationalism and empiricism, this sense of mystery claims that while all aspects of reality can and may eventually be known, it is a state of affairs that in no way diminishes a sense of mystery. In fact, the sense of mystery it evokes is akin to that of aesthetics, or beauty, which is further characterized in terms of various emotional responses (i.e., wonder and awe, and specific attributes of material and form, including "proportion," "order," "harmony or symmetry," "unity," "integrity and perfection," "clarity," and "radiance" (Verkamp, 1997, pp. 24-35)). Whereas the deniers of mystery claim to "demystify" nature, regarding aesthetics as a source of mystery in the first place moves beyond mere problem-solving, to embrace and celebrate the rationality of the universe as something that makes the solution to the world's problems possible. In this case, it is rationality that evokes wonder and reverence. Such a sense of mystery is both cognitive and emotional, and associated with the beauty inherent to a work of art. In the words of Moritz Schlink (1963), who captures the sentiment of this sense: "The more we know of the world, the more we shall marvel at it; and if we should know its ultimate principles and its most general laws, our feeling of wonder and reverence would pass all bounds" (p. 24).

A *skeptical* sense of mystery, unalike the previous two senses of mystery, is still a derivative of the non-spiritual domain, and the product of our realization that our dependency on rationality and empiricism is limited. The use of the term "skeptical" is somewhat misleading, in the sense that one may conclude that our sense of mystery is derived through the exercise of "skepticism." Rather, Verkamp (1997) is suggesting we remain skeptical of deriving a sense of mystery solely from rationalism or empiricism. Moving the epistemological foundation of mytery beyond rationalism and empiricism fundamentally shifts

it toward one based more on spirituality; and a view of knowledge founded more on faith. In other words, there are limits to human understanding because reason and empiricism cannot illuminate all there is to know about our world. There may be other ways of "knowing" beyond reason or empiricism. A variety of thinkers throughout history have subscribed to a skeptical sense of mystery, proposing a variety of well-reasoned arguments to support their conclusions. Our intent here is not to summarize the these arguments, but rather focus upon a camp of philosophers who alternatively argue that the skeptical sense of mystery is the result of what Milton Munitz (1965) refers to in the title of his book, as *The Mystery of Existence*. The mind's realization of our existence in the world around us is what brings this sense of mystery into focus. Heidegger's (1953/2000) infamous question, "Why is there anything at all, or something, rather than nothing?" (p. 9) is another example of the confrontation of our mind with the world. Such a skeptical sense of mystery represents a significant shift from the natural realm into the metaphysical. For an accessible survey of the variety of attempts to explain *the mystery of existence* Jim Holt's (2012) book *Why Does the World Exist?*, is helpful. As this particular 'mystery' (the mystery of existence) has existential connotations we defer to the metaphysicians to sort through the semantic quagmire. The objective of a skeptical sense of mystery is to use philosophical metaphysics to cast a "skeptical cloud" over conventional epistemological avenues (e.g., rationalism and empiricism) that have traditionally denied mystery. Mystery, then, is not simply "denied" nor elevated through "aesthetics" and the feelings or emotions that it invokes, but rather, the possibility for mystery is preserved through skepticism of why and what our existence in the world means.

Spiritual Domain and the Senses of Mystery

As mentioned at the outset of this section, spiritual domains of mystery result in *sacred*, *immanent*, and *transcendent* senses of mystery, primarily mediated through a realm of metaphysical experience, and pursued rigorously by the disciplines of philosophy and theology. While various spiritual traditions uphold a common belief in mystery as "something more," they differ in terms of what the "something more" might be.

A *sacred* sense of mystery experiences "something more" as something that is "totally other" (Verkamp, 1997, p. 67). As such, spiritual peoples' sense of mystery is closely linked with a sense of the sacred. In contrast, a non-spiritual people tend to view nature more homogenously, meaning they make no distinction between sacred and profane events, while spiritual people tend toward viewing nature in heterogeneous ways. Nature, spiritual people contend, consists of people, places, times, things, and actions, and is interpreted along a continuum between sacred *and* profane characteristics. The "something more" that exists beyond reality is that which is "totally other", or "holy" or "Godlike," in and beyond nature (67-84).

A sense of mystery as *immanent* is also derived from the spiritual domain. It views the "something more" as "something within." This is its distinguishing feature. God and nature are distinct; yet God's presence is, or may be experienced as, a spiritual force within the phenomena of nature. Thus, spiritual people tend to experience a sense of mystery as being associated with a sense of the immanent presence of God *within* the phenomena of nature.

The last spiritually derived sense of mystery is that of a sense of mystery as *transcendent*. Transcendence means "something beyond," what may be viewed as normal or physical, however it is important to recognize that spiritual traditions differ on their conception of transcendence. Exploring these more fully is beyond the scope of this paper. Important for our purposes is how what is essential to a spiritual transcendental sense of mystery is the "something more" of the spiritual experience, thought or felt to lie "beyond" the present world (Verkamp, 1997, p. 107).

Common to all three spiritual senses of mystery is a degree of skepticism. While all three agree there is something lacking in our understanding of God, they differ as to the reasons for this "lack." Some feel this lack is simply the limits of human comprehension, and that given enough time, we may come to know all there is to know about the spiritual phenomenon, and as a result, the particular sense of mystery in question will disappear. In contrast, others contend their spiritual sense of mystery is due to the unlimited nature of God's being, undoubtedly and forever beyond the reach of human comprehension. In this way, the more one knows about God, the more mysterious God becomes. One is literally and figuratively blinded by the light of God's stupefying brilliance. Humanity, nonetheless, is open to experiencing rapture in the face of the universe's beauty, and the holy mystery that shines from within or beyond the cosmos (Karrow & Harvey, 2015).

Mapping EE Currents onto the Mystery Typology. A preliminary mapping of scientific, feminist, and naturalist currents of EE onto our mystery typology is revealing. These three currents of EE approximately align with the binary categories delimiting our mystery typology. And while we could have exhaustively mapped the remaining currents of EE onto our typology, this would have resulted in a confusing and unwieldy manuscript. Using these three, rather than all fifteen currents of EE can illustrate the trend and point of our discussion. We should acknowledge that, as with any exercise of this kind, it is one fraught with a desire for things to "align," and here this may not be the case. However, we find that some general patterns hold as reasonably true. For instance, a scientific current of EE (Sauvé, 2005) (Figure 2) views the environment as an object of study, where the aim of EE is to acquire knowledge of the environment while developing skills related to the scientific method. This tends to emphasize more cognitive and experiential pedagogical approaches with activities oriented toward the study of phenomena; observation; demonstration; and experimentation:

[here it may be useful to denote that these qualities are: defined as; or characterized as...] hypothetic-deductive research activity (Sauvé, 2005, p. 33).

Such a current of EE maps clearly onto our typology in the non-spiritual domain, where a scientific realm of experience results in a sense of mystery as denied (Figure 1). Such a view has little to no tolerance of mystery in relation with knowledge. At the other extreme, a feminist current of EE (Sauvé, 2005) (Figure 2) views the environment as an object of solicitude, where the aim of EE is to integrate feminist values into the human-environment relationship. In contrast, it tends to favour pedagogical approaches that are intuitive, affective, symbolic, and spiritual, as well as creative/aesthetic employing strategies such as case studies, immersion, creative workshops, and communication and exchange activities (Figure 2). Such a current of EE tends toward a more spiritual domain, where a theological realm of experience could result in a sense of mystery as sacred, immanent, perhaps even transcendent (Figure 1). What distinguishes the spiritual domain from the non-spiritual domain is a sense that there is something more to reality that we cannot explain; something more that exists beyond reality in a sacred sense of mystery than that which is totally other, holy, or Godlike; as such, in or beyond nature. An immanent sense of mystery supplies how "something more" lies within nature, and that in a transcendent sense of mystery something more lies beyond (Verkamp, 1997).

In contrast to the scientific and feminist currents of EE is the naturalist current (Sauvé, 2005) (Figure 2). Nature qua *nature* is the conception of the environment. The aims of EE are to reconstruct a link with nature through such pedagogical approaches that are sensorial, cognitive, affective, experiential, creative/aesthetic, using such activities that are immersive, interpretive, or discovery-based (Sauvé, 2005). There is a distinct blend here of non-spiritual and spiritual domains, deeply rooted in a philosophical (metaphysical) realm of experience. Along our typology, this could be located toward the center, resulting in a skeptical-sacred sense of mystery (Figure 1). This view of mystery is rooted in the belief that we cannot know all there is of reality and, that under certain circumstances, knowledge of everything may elude us. As such, it borders on a skeptical sense of mystery, positing there is something more to reality and that something more is vested in the other, or sacred et al. senses of mystery (nature itself, a holy figure, or deity). Although beyond the scope of this paper, an argument as to why this is desirable has been articulated in previous works (Harvey & Karrow, 2016; Karrow & Harvey, 2015).

Interpretive Analysis of the Naturalist Current of EE. The naturalist current of EE is of particular interest to us. Specifically, we assert that a naturalist current of EE might serve as a foundation or thalweg (from the Old German, *thal* = valley; + *weg* = way) (Oxford University Press, n.d., *thalweg*) for the currents of EE. "Thalweg" is the "valley-way" or deepest part of the river channel eroded through

time. As such, while it may change slightly depending on the rise and fall of all "currents," it persists, remains, and is ever-present. It is the fundamentum for the mass of intermingling, intertwining, and meandering currents that course through the valley way. It flows more slowly, yet deliberately, and pervasively underneath a river. Through its depth, volume, and density it stabilizes the valley way, providing some degree of structure and form to a dynamic river over time.

We believe a naturalist current of EE is well-suited to *found* other currents of EE for several reasons, and while Sauvé's (2005) 15 currents of EE are generally presented a-historically (notwithstanding the division of the 15 currents into two temporal periods, e.g., "Longer Tradition" vs. "Recently Emerged" (p. 13)), a-ideologically, and a-philosophically, we believe there may be benefits to doing so more explicitly. Building and extending upon Sauvé's original metaphor of "currents," we invoke the root metaphor of the river by considering the thalweg or valley-way. Our playful interpretation of the concept in the previous paragraph extends meaning to the context of our discussion. In an analogous way, a naturalist current of EE could function as a thalweg to other currents of EE. This is further supported through an etymological tracing of the root of naturalist in the form of the word, *nature*.

The Latin philosopher Eriugena defined nature as the totality of all things, including both the *things which are* as well as *those which are not* (Moran & Dew, 2021, John Scottus Eriugena, 3.1). The word nature itself poignantly encapsulates the mystery/knowledge dynamic, and in this sense is its linguistic and conceptual precursor. In our desire to ameliorate such binary distinctions, nature, or as is the case here, a naturalist current of EE, beautifully accomplishes this aim. Philosophically, the naturalist current of EE, as juxtaposed with our typology of senses of mystery, neatly bridges domains, realms of experience, and the spectrum of senses of mystery residing near a skeptical-sacred sense of mystery. Such a sense of mystery beautifully reflects the intrinsic and mutually sustaining relationship between a sense of mystery as completely denied and at the other extreme, a sense of mystery as transcendent, where mystery trumps any claim to knowledge. What this means, is the relationship between mystery with knowledge is attuned, balanced, and mutually sustaining. Cooper (2002) refers to this as a *doctrine of mystery* where the absolutist and naturalist camps of reality achieve some measure of co-existence. Such a doctrine of mystery, we argue, serves as the philosophical footing to develop an original philosophy of education that nurtures an ethos of mystery for environmental education theory and practice (Karrow & Harvey, 2023). The broad parameters of such a philosophy of education and the implications this may have on environmental education theory and practice are intriguing to ponder as we further this work.

Deriving further from philosophy, there are epistemological and ontological reasons to advocate why a naturalist current of EE might found other currents of EE. By virtue of the skeptical-sacred sense of mystery, where knowledge is in

relation with mystery, questions about how we come to know, or what counts as knowledge, come to the fore. Here, then, there is a co-mingling of non-spiritual with spiritual domains, and scientific, philosophical, and theological realms of experience. So too, our ways of knowledge—respectively through empiricism, rationalism, and faith—may each be accessed and celebrated. Epistemological diversity becomes the norm (Figure 1). Such epistemological diversity also has an effect on ontology, where the net effect of this becomes realized through the dissolution of the traditional object and subject binaries (see Figure 1 for the continuum of subject/object relationships). One might claim, epistemology and ontology become more closely attuned in that through knowledge one develops ontologically; and conversely, through our ontological development one gains knowledge (Figure 1). Lastly, educationally speaking, a naturalist current of EE, because of its metaphoric and etymological possibilities; and further, the philosophical (epistemological and ontological) functions that are gained, inherently cultivate two of three fundamental aims of education. These aims include inculcation of the learner into the *forms of knowledge* (Plato) and the *developmental needs* of the learner (Rosseau) (Egan, 1997). We would go further and add that in achieving the first two, the third aim, *socialization* of the learner (Dewey) is also satisfied. We will expand on this later.

Implications for Re-considering Environmental Education in the Light of the Skeptical-Sacred Sense of the Knowledge/Mystery Dynamic

How Does this Situate us to (Re)-consider EE?

By mapping three of Sauvé's (2005) currents of EE onto our mystery typology, we are able to discern several things not overtly apparent. First, we created a space to acknowledge that mystery and knowledge share an important dynamic. Second, through the mapping exercise itself, we identified one current (there are others within the fifteen as identified by Sauvé) that is premised on the understanding that mystery and knowledge share this important dynamic and that this is rooted in a philosophical position somewhere between the movements of naturalism and absolutism. This reveals the role(s) that various philosophical positions on reality can have on our currents of EE and exposes, in our view, one of several deficiencies with Sauvé's (2005) exercise. That being, the classification exercise does not explicitly consider philosophical viewpoints undergirding EE currents and presents them in a fashion somewhat a-philosophical and a-historical. This engenders several misconceptions: namely EE currents are contemporaneous, discrete, and unrelated movements; also, epistemologically and ontologically undifferentiated. This begs the additional question concerning larger educational aims. Beyond Sauvé's (2005) general and vague descriptors of "Dominant Approaches" (i.e., infer pedagogical) and

"Examples of Strategies" (i.e., infer pedagogical exercises or techniques) there remain outstanding questions as to what types of thinking each current fosters, what pedagogical approaches are appropriate, how learning is viewed, and the wider curricular implications this all entails. We propose to shift the frame of reference slightly from discounting a philosophy of reality and presents as a-historical, to one that fully recognizes how a philosophy of reality and its historical relationship and development ground currents of EE, allowing us to re-consider EE in the process. As such, we can now turn our attention to the second question: what remains to be re-considered?

Current	Conception of Environment	Aims of Environmental Education	Dominant Approaches	Examples of Strategies
Naturalist	Nature	Reconstruct a link with nature.	Sensorial, Cognitive, Affective, Experiential, Creative/Aesthetic	Immersion; interpretation; Sensorial games; Discovery activities.
Conservationist/ Resourcist	Resource	Adopt behaviours compatible with conservation. Develop skills related to environmental management.	Cognitive, Pragmatic	Guide or code of behaviours; 3 Rs set of activities; Environmental audit; Conservation projecct.
Problem-solving	Problem	Develop problem-solving skills; from diagnosis to action.	Cognitive, Prgamatic	Case study; issue analysis; Problem-solving project.
Systemic	System	Develop systemic thinking; analysis and sythesis, toward a global vision. Understand environmental realities in view of enlightened decision-making.	Cognitive	Case study; Environmental system analysis; Construction of ecosystem models.
Scientific	Object of study	Acquire knowlege in environmental sciences. Develop skills related to the scientific method.	Cognitive, Experiential	Study of phenomena; Observation; Demonstration; Experimentation; Hypothetico-deductive research activity.
Humanistic/ Mesological	Living Milieu	Know and apreciate one's milieu of life; better know oneself in relation to this living millieu. Develop a sense of belonging.	Sensorial, Affective, Cognitive, Experiential, Creative/Aesthetic.	Itinerary; Landscape reading; Study of milieu; investigation.
Value-centred	Field of values	Adopt ecocivic behaviours. Develop a system of ethics.	Cognitive, Affective, Moral	Analysis of values; Clarification of values; Criticism of social values.
Holistic	Holos, Gaia, All, The Being	Develop the many dimensions of one's being in interaction with all aspects of the environment. Develop an 'organic' understanding of the world and participatory action in and with the environment.	Holistic, Organic, Intuitive, Creative	Free exploration; visualization; Creative workshops; Integration of complementary strategies.
Bioregionalist	Place of belonging, Community project	Develop competencies in/for local or regional community ecodevelopment.	Cognitive, Affective, Experiential, Pragmatic, Creative	Exploration of our shared milieu; Community project; Project of local or regional ecodevelopment.

Current	Conception of Environment	Aims of Environmental Education	Dominant Approaches	Examples of Strategies
Praxic	Lotus of action/ reflection	Learn in, by, and for environmental action. Develop reflexive skills.	Praxic	Action-research; Reflective posture in activites or project.
Socially Critical	Object of transformation, Place of emancipation	Deconstruct socio-environmental realities in view of transforming them and transforming people in this process.	Praxic, Reflexive, Dialogic	Analysis of discourses; Case study, Debate Action-research.
Feminist	Object of solicitude	Integrate feminist values into the human-environment relationship.	Intuitive, Affective, Symbolic, Spiritual, Creative/Aesthetic	Case study, Immersion, Creative workshop, Communication & exchange activity.
Ethnographic	Territory, Place of identity, Nature/culture	Recognize the close link between nature and culture. Clarify one's own cosmology. Valorize the cultural dimension of one's relationship with the environment.	Experiential, intuitive, Affective, Symbolic, Spiritual, Creative/ Aesthetic	Fables, Stories and legends; Case study; Immersion; Modelling; Mentoring.
Eco-Education	Role of interacation for personal development. Locus of identity costruction	Experience the environment to experience oneself and to develop in and through it. Construct one's relationship with the "other-than-human world."	Experiential, Sensorial, Intuitive, Affective, Symbolic, Creative	Life story; Immersion; Exploration Games; Introspection; Sensitive listening; Subjective/ objective *alternance*
Sustainable Development/ Sustainability	Resource for economic development. Shared resource for sustainable living	Promote economic development that takes care of social equity and ecological sustainability; Contribute to such develpment.	Pragmatic, Cognitive	Case study; Social marketing; Sustainable consumption activities; Sustainable living managment project.

Notes. (1) The original figure has been reproduced from Sauvé, L. (2005). Currents in environmental education: Mapping a complex and evolving pedagogical field. *Canadian Journal of Environmental Education, 10*, 11-37. (2) There is no order of hierarchy implied in the presentation of the various currents of EE.

Figure 2. Characterization of Fifteen Currents in Environmental Education (Sauvé, 2005).

What Remains to be [Re]considered?

The obvious answer here is that Sauvé's (2005) seminal yet critical work on characterizing currents of EE could be re-visited[6] to trace, more carefully, how all currents of EE are informed by philosophies of reality, their historical relationships, and their educational implications. This would be an excellent time to re-visit Sauvé's work in lieu of what has transpired since it was originally conceived. In doing so, a more adequately and thorough relationship between the currents of EE may be illustrated, bringing them into a contemporary context, moving them forward by considering their broader educational aims in greater

detail, and by suggesting the implications this may have on its constituents: thinking, pedagogy, learning, and curriculum.

Previously, we referenced three generally recognized aims of education as including inculcation into the forms of knowledge, the developmental needs of the learner, and socialization (Egan, 1997). The three currents of EE examined here—scientific, feminist, and naturalist—are representative samples of the fifteen currents of EE, in that they span our typology of senses of mystery and reflect the foundational philosophies of reality and their historical relationships to one another (Cornfield, 2018). In turn, they have the capacity to reveal certain predilections and aims of education more broadly, over and above others. To over simplify, a scientific current of EE inherently supports an aim in education that favours the pursuit of knowledge, while marginalizing mystery. A feminist current of EE, in contrast, is more oriented toward an aim that education emphasize the developmental needs of the subject. A naturalist current of EE, due to its alignment with a skeptical-sacred sense of mystery, inherently supports the first two aims of education with their emphases on inculcation to forms of knowledge (e.g., mathematics, the physical sciences, the human sciences, history, religion, literature and the fine arts, philosophy and moral knowledges, Hirst (1974).) and the developmental needs of the learner. We suggest in supporting these two aims of education, the third—socialization—necessarily occurs.

To support our claim that a naturalist current of EE can be found in other currents of EE, we suggest an exploration of how the three aims of education shape the constituents of thinking, pedagogy, learning, and curriculum. As the naturalist current of EE is consistent with a skeptical-sacred sense of mystery, we may take the opportunity to exercise ways of knowing and thinking that are both calculative and meditative (Heidegger, 1966). In other work, we have demonstrated (Harvey & Karrow, 2016) how emotional ways of knowing can support diverse types of thinking. For example, the affect of wonder is a precursor to two derivative emotions: curiosity, suited to the development of calculative thinking; and awe, which nurtures more meditative forms of thinking. In terms of pedagogy, beyond the vague descriptions provided by Sauvé (2005), the question arises as to what teaching approaches might best support such varied types of thinking. Because of the range of thinking implied here, considering approaches to teaching able to provide the opportunity to stimulate, develop, and nurture the capacity for both calculative and meditative thinking becomes that much more desirable. A skeptical-sacred sense of mystery ideally orients pedagogical activities in ways that could foster diversities of thought—calculative and meditative—the details of which are only suggestive (Harvey, 2009). What implications are there for learning? The question in and of itself immediately foregrounds an aim of education directed toward the needs of the individual. What pedagogical strategies are most appropriate for the developmental needs of the student? In what ways might a skeptical-sacred sense of mystery orient

the aim of education? At the outset of this section, we conceded a sense of mystery of this kind attunes well with the first and second aims of education—knowledge and developmental needs—with the third socialization—occurring as a consequence of the previous two. When considering the developmental needs of the learner, this aim immediately moves to the forefront. This too is an area for further consideration. Lastly, what implications are there for curriculum? Accepting a traditional definition of curriculum as *what* material is to be taught and *how* we shall go about teaching it (Petrina, 2004), there are significant implications with a naturalist current of EE as it reflects a skeptical-sacred sense of mystery. A careful sorting of the relationships between the three aims of education would further shape the content of the curriculum, and how it would be taught to children.

Summary

In (re)considering EE we have centred our work on Sauvé's (2005) seminal and important characterization of the currents of EE. In its time, Sauvé's work was critical in beginning to identify and trace the different currents of EE through the exercise of classification and then nomenclature. What we bring to the fore is consideration of philosophical views of reality, their historical relationships, and further consideration of realms of experience (scientific, philosophic, and theological) by focusing the discussion on senses of mystery and their resulting mystery/knowledge dynamic. By doing this, we shift the focus of the classifying and naming exercise that Sauvé's (2005) currents of EE is premised on, to one founded on a philosophy of reality and the historical relationship(s) illustrated by considering pre-modern, modern, and postmodern paradigms.[6] This shifting of the framing of EE currents, and their revealing manner, allows us to entertain how EE might be (re)considered. As this happens, questions surrounding the implications this process has for education, and the three traditional aims of education—forms of knowledge, developmental needs, and socialization—are brought to the fore (Egan, 1997). We have briefly explored the implications such aims may have on education's constituents: thinking, pedagogy, learning, and curriculum. Recognizing our exploration is cursory, we concede there is much work to do in our (re)consideration of EE. For instance, there is the outstanding task of better relating the relationship between the three aims of education more clearly, and whether these are contradictory (Egan, 1997); or, whether a naturalist current of EE may offer unique ways to accomplish each approach. There is also the larger task of teasing out the granular details of how these divergent aims of education are further characterized through the constituents of thinking, pedagogy, learning, and curriculum.

Endnotes

[1] We use the term primordial in the sense of ancient, prior to the differentiation between knowledge and mystery.

[2] We have opted to use the scientific, feminist and naturalist currents as our continuum of senses of mystery map neatly onto them. As they frame the limits of this continuum and as the remaining currents of EE align approximately with these limits, trends can be deduced for illustrative purposes strengthening our argument.

[3] Although Schwab (1978) originally conceived of the four education curriculum commonplaces as including: teaching, learning, subject and milieu, we have adapted this scheme for our purposes. We are thinking beyond 'curriculum' per se, to the larger phenomenon of public education where thinking, pedagogy, learning and curriculum characterize the larger phenomenon.

[4] At the suggestion of one reviewer, we have used the term "spiritual" vs. "non-spiritual" to refer to Verkamp's (1997) religious and non-religious designations.

[5] The authors recognize a certain historical logic prevails where theological discourse evolved into philosophical (metaphysical) and presently scientific realms of experience (See: Cornford, 2018).

[6] Personal communications with Dr. Sauvé have hinted at her desire to revisit her (2005) publication (Currents in environmental education: Mapping a complex and evolving pedagogical field) and update her original scheme.

Notes On Contributors

Douglas D. Karrow is associate professor of science/environmental education, Department of Educational Studies,,Faculty of Education, Brock University. Correspondence concerning this paper should be addressed to Douglas D. Karrow, 1433 Headon Road, Burlington, ON. L7M 3ZS, (905) 547-3555 x3614

Sharon R. Harvey is Associate Teaching Professor and director of General Education and General Studies at Arizona State University at Lake Havasu, 100 University Way, Lake Havasu City, AZ 86403, (928) 854-9734.

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Empowering Spiritual Human-Nature Relationship through Mindfulness Pedagogical Paths

Irida Tsevreni, University of Thessaly

Abstract
This study emphasises the need to empower spirituality within the framework of environmental education, and demonstrate its value as a vital component in the human-nature relationship. This is proposed through utilizing the meaning, content and practice of mindfulness. The examination of mindfulness, as a pedagogical philosophy as well as methodology, contributes to the relief of our disconnectedness as humans from nonhuman nature, and to the creation of a harmonious relationship with the nonhuman world. Thus emerge three pedagogical paths: slowing down from the frenetic rhythms of our everyday lives in contemporary high-tech societies and promoting mindful connection with nature; mindful eating, and cultivation of empathy for the Earth as well as all living creatures. Mindfulness has the potential to play an essential role in the empowerment of ecological consciousness, based on the principles of coexistence and solidarity between human and nonhuman beings. This empowers the development of a sensorial and spiritual human/nature bond, and an embodied empathy for all living creatures, developing feelings of compassion for all of Earth's inhabitants, as well as humility and gratitude towards the more-than-human world.

Résumé
La présente étude plaide en faveur de la spiritualité en éducation à l'environnement et démontre son importance vitale dans la relation qu'entretiennent les êtres humains avec la nature. Pour ce faire, l'étude propose d'aborder la spiritualité par le biais de la pratique de l'attention consciente (pleine présence); son sens, ses fondements et sa pratique. La présente analyse de l'attention consciente comme philosophie pédagogique et outil méthodologique souligne sa capacité à rapprocher les êtres humains de la nature non humaine et à rétablir une relation harmonieuse entre êtres vivants. Cette démarche pédagogique se divise en trois objectifs : ralentir le rythme et interagir en conscience avec la nature; s'alimenter de manière consciente; et cultiver de l'empathie envers la Terre et toutes ses formes de vie. En l'ancrant dans des principes de coexistence et de solidarité entre êtres humains et non humains, l'attention consciente a le potentiel prometteur de développer la conscience écologique. Elle soutient l'importance pour les humains de tisser des liens sensoriels et spirituels avec la nature, et de développer des sentiments d'empathie, de compassion, d'humilité et de gratitude envers toutes les espèces de la Terre, au-delà du monde humain.

Key-words: mindfulness, human-nature connection, ecological consciousness, environmental education, spirituality

Mots-clés : attention consciente, pleine présence, relation entre humains et nature, conscience écologique, éducation à l'environnement, spiritualité

Introduction

It is now acknowledged that the global ecological crisis threatens not only the natural equilibrium of the planet, but also our physical and spiritual existence. It is a crisis of human feeling, our spiritual existence, and a threat to our entire mode of sensibility (Bonnett, 2007). Western civilisation is now beginning to realise that the ecological crisis arises from a split consciousness separating mind from body and self from the world (Bai & Scutt, 2009). Beginning from the decline of the human/nature relationship by Descartes in the 17th century (Lenoir, 2018), the hyper-separation of self/word and nature/culture is responsible for the instrumentalist treatment of the natural world (Naess, 1988; Latour, 2004).

There is an increasing number of voices that underline the separation of modern societies from nature, and the important consequences this estrangement effects on the spiritual development of human beings (Driver, et al., 1996; Kaza & Kraft, 2000; Kellert & Farnham, 2002). Sandell & Öhman (2010) argue that education for sustainable development may be further developed by adding a fourth dimension that is not ecological, economic, or social, “but is rather a comprehensive existential perspective that originates from aesthetic and emotional relations with nature – the direct encounter with nature” (p. 125).

The presumed separation of humanity from the natural world may have offered benefits to technology and science, but it has also deprived us of instinctual connections to the spiritual domains of life — the connection between the human soul and the soul of the world, as well as sense and belief that we are all in and of the world — interconnected as human and nonhuman (Vaughan-Lee, 2013). Kumar (2004, 2008) highlights the underestimation of the spiritual dimension of human beings, along with all living creatures and natural elements that comprise a modern material, competitive, and alienated world, where human beings are considered the superior species, and nature a resource to be possessed and exploited to satisfy human needs. Spirituality includes an experienced based form of insight, based on inner-attention, bodily experience and consciousness. It is an epistemic stance where the knowledge does not manifest as theory that can be communicated through language but can be demonstrated though spiritual practice. Spirituality involves insight and ethics (Metzinger, 2013).

The fact that the spiritual dimension in the human/nature relationship has again become timely reflects a modern trend in ecological thought — that of

spiritual ecology. This transdisciplinary study combines ecology with spirituality, and identifies the absence of the spiritual dimension in the human/nature relationship as a central cause of ecological crisis. Spiritual ecology includes a variety of perspectives, from Buddhist, to Christian, to secular spirituality, as well as native American, Indian, Persian and Sufi traditions, all commonly based on a need to emphasise spiritual development in harmony with nature, against the modern materialistic and consumerist society (Gottlieb, 2004; Vaughan-Lee, 2013).

Many authors have approached spirituality as a dimension of the human/nature relationship. Kumar (2004) approaches spirituality as liberation from the ego identity, as a praxis of compassion and caring, promoting consciousness of interconnection and sharing with all human and nonhuman creatures, to companion the matter of the Earth. Ashley (2007) has defined wilderness spirituality as:

> A feeling of connection and interrelationship with other people and nature; a heightened sense of awareness and elevated consciousness beyond the everyday and corporeal world; cognitive and affective dimensions of human understandings embracing peace, tranquillity, harmony, happiness, awe, wonder, and humbleness; and the possible presence of religious meaning and explanation (p. 65).

As spirituality emerged in the field of ecological thought, it was also introduced in the field of education (Carr & Haldane, 2003; London, 2016; Miller, 2000; Wright, 2000). There is evidence to support how children's spiritual development has the potential to significantly enrich and strengthen positive human development (Benson, et al., 2003). According to Wilson (2017):

> While spirituality and education are seldom linked in discussions about the role of schools in our society, the failure to include the spiritual development of children as an educational goal does a great disservice to our children. If the focus of education is on the development of the whole child (rather than just the intellect), the spiritual dimension of our humanness must be addressed. It is a serious fallacy to think that young children are not ready for spiritual growth or that they do not have spiritual experiences (p. 5).

Within the framework of the pedagogical process, Bellous and Csinos (2009) define spirituality as a sense of felt connection, a concept that grounds the capacity to make meaning and to live a meaningful life, through words, emotions, symbols and actions. Spirituality, in the context of education, is presented as a worldview that includes a belief of the sacred as essential to human nature, beyond material reality. It is a process of internal development, and an opening to the transcendent, nonmaterial dimension of our human existence (Snauwaert & Kane, 2000).

Even without extensive literature to support these principles, some voices that raise the issue of spirituality in environmental education reveal the

potential further research on the field holds (for example, see Hitzhusen, 2005; Skamp, 1991; Canadian Journal of Environmental Education, Volumes 11 & 12). Thathong (2012) approaches spirituality in environmental education from a Buddhist perspective, and argues that environmental protection strategies must pay special attention to the psychological dimension of human nature, while promoting harmonious living between all living creatures as well as the environment. Additionally, environmental education can foster environmentally-friendly values such as selflessness, thriftiness, love and kindness, social responsibility, and compassion within the framework of a nurturing spiritual relationship between humankind and the environment. Jirasék, et al. (2017) suggests how spirituality can be integrated with environmental education to find alternative ways to empower the human/nature bond, and develop an ecological consciousness independent of the rational and the scientific.

This paper examines the pedagogical dimension that can be developed through the human/nature connection. It proposes how connection between human and nonhuman nature can play a vital role in empowering spiritual development (Baumgartner & Buchanan, 2010; Schein, 2014). The potential benefits to be gained through engagement with, and connection to, the spiritual dimension, and associated with nonhuman nature are examined. As a part of the human/nature - connection, within the framework of environmental education, spirituality can be approached through the meaning, content, and practice of mindfulness, much as it has been featured and implemented in other disciplines of Western science, art, and pedagogy. The potential of mindfulness practice in environmental education is discussed, analysing what is a promising, alternative view to develop an internal, existential human/nature bond.

Mindfulness, according to Kabat-Zinn (2016), is an awareness cultivated by paying attention to one's purpose, living in the present moment, and remaining non-judgemental of others. Mindfulness promotes maintaining a relationship based on love with the beauty of our own heart, body, and mind, and extend that to engagement with the world, life, reality, and the imagination. According to Zen master Hanh (2013), mindfulness is the continuous practice of touching each moment in daily life with depth. To be mindful is to be present with the body, as well as the mind, and to find unity between intention and action, in order to be in harmony with the surrounding world. Mindfulness helps us recognise what is going on around us as human beings living in the present moment. To breathe in mindfully, is to be aware of our in-breath. Being present in the here and the now through mindfulness is to help a person enjoy the wonders of life, which have the potential to heal, transform, and nourish us, body and mind. Meditation, as a mindfulness practice, is often used as a means for self-improvement, improving quality of life, and addressing problems associated with living in the Western world (McMahan, 2008).

Research into mindfulness within the context of pedagogy (Adarkar & Keiser, 2007; Bai, 2001; Ergas, 2019b; Hoyt, 2016; Hyde & LaPrad, 2015; Simmer-Brown

& Grace, 2011) has looked into is value as a method of stress reduction, and a way to promote the well-being of students and educators, in addition to the holistic development of students and improving their cooperation within the classroom (e.g., Accardo, 2017; Bliss, 2017; Brown, 2017; Ergas, 2019; Grant, 2017; Hartigan, 2017; Kielty et al., 2017; Moreno, 2017; Routhier-Martin et al., 2017; Trube, 2017). Taking into account all the above issues and dimensions, it would be worth investigating if and how mindfulness can contribute to the formation of a holistic approach to environmental education by adding to pedagogical theory and practice an element that has not yet been particularly studied: that of students' spiritual relationship with nature.

Mindfulness in Environmental Education

An essential part to the aims and discourse in current environmental education is the worldwide discussion that has emerged surrounding the current generation's "ecophobia"—the fear of environmental problems and the natural world (Sobel, 2013) and environmental amnesia (Tai et al., 2006). Already, studies have been conducted highlighting the benefits of child/nature connection, relating the development of the body to that of the mind, in addition to an environmental consciousness (Bonnett, 2004; Bruni et al., 2017; Elliott, 2010; Ernst & Theimer, 2011; Fjortoft, 2001; O'Sullivan & Taylor, 2004; Sandell & Öhman, 2010; Wells, 2000).

However, few studies have investigated these topics with regards to the spiritual dimension of a child/nature connection. Schein's (2014) research into spirituality in early childhood education highlighted the interconnectedness among nature and spiritual development, which manifests as self-awareness and dispositions of wonderment and joy, caring, kindness and empathy towards the creation of a better world. Bai & Scutt (2009) have examined the practice of Buddhist mindfulness to assist in cultivating a non-dualistic consciousness, to better connect humans with nature, and lead to more compassionate attitudes, as well as conduct, towards the other-than-human. They put forth that mindfulness should be an essential part of environmental education, and that mindfulness can contribute to the development of a better intersubjective connection with nature. Bai (2001) argues that mindfulness can be a valuable educational tool in environmental education, as it can teaches how to perceive nature as a sacred order, through which an individual can participate as both friend and lover, and experience a sensorial empathy with nature and all living creatures.

Recently, the potential of mindfulness has emerged as a tool to foster the human/nature connection (Nisbet, et al., 2019). Mindfulness research has also been done within the framework of ecological consciousness as a way to empower an embodied, sensorial, and ecocentric bond to the more-than-human world (Pulki, et al., 2017; Tsevreni, 2022; Witteman, 2020).

Included within the wider field of mindfulness, are practices that include various techniques (e.g., yoga, dance, free writing, contemplative art) in order to cultivate concentration, awareness, communication, and connection (Barbezat & Bush, 2014). According to Hanh (2013), mindfulness practice can be achieved through meditation, breathing exercises, an awakening of the senses, focusing on participation through cooperation and solidarity, as well as contact with nature. There are ancient, traditional techniques of meditation based on the human/nature relationship (Fisher, 2013). Such techniques have been westernized, and adjusted to our modern societies, but have the potential to help us escape from material, consumerist culture and a way of life that can be overwhelmed by the hustle and bustle of large cities, and emphasize the benefits of our reconnection with the non-human world (Coleman, 2006). Principles and techniques, based on meditation, have the potential to be used as a tool in the creation of a spiritual connection with nature, and inspire a process of self-awareness that mindfulness can offer. Further, developing mindfulness practice in the context of connection with nature can help expand a receptiveness to the natural world, quiet internal noise, improve our connection with nature, and begin to comprehend the vital role that our connection with that natural world can play in the improvement of human lives.

Based in pedagogical theory and praxis as outlined above, the practical contribution of mindfulness to the achievement of a harmonious human relationship with the natural world is examined and analyzed through three pedagogical paths: 1) slowing down from the frenetic rhythms of our everyday lives and mindful connection to nonhuman nature, 2) mindful eating, and 3) a cultivation of empathy for the Earth and all living creatures within its environment.

Pedagogical Paths through Mindfulness

Slowing Down and Mindful Connection to Nonhuman Nature

Mindfully connecting with a natural place, in whatever form, can offer multiple benefits. Finding a natural place that inspires, be it a wood, river, pond, meadow, sandy cove, particular vista, or even a tree can provide a backdrop to awaken our senses and develop a mindfulness practice to assist in forming a relationship to it. In visiting settings which inspire multiple times, at variable points during the day and different seasons of the year, allows for the opportunity to become conscious of the ecosystem itself, and for it to reveal itself. Through better understanding and knowledge, the practice of mindfulness can foster a sense of closeness to the ecosystem, and realize how we as humans are a part of it, and not the only living beings aware of its presence. Interacting mindfully with a natural location can offer an embodied, sensorial experience that and contribute to the creation of a bond with the more-than-human world (Abram, 1997; Coleman, 2006).

There are concepts of meditation with the capacity to contribute to a stronger relationship between nature, manifested in the form of the four elements: water, air, earth and fire or as nonhuman beings and entities. Coleman describes a meditation, inspired by the Buddhist tradition, that helps recognize the familiar sense of the four elements within our human body (Coleman, 2006), and proposes that this is most ideally experienced in a natural place, where an individual can be in contact with those elements. As featured by Starhawk (2005), a spiritual tradition for approaching nature based on eco-mindfulness, solidarity, and a harmonious coexistence of humans with nature, is honoured by a meditation practice grounded in the four elements of nature. The Gaia Meditations by Seed & Macy (1988), also celebrate cycles of partnership, and the intersections of water, earth, air and fire with human beings. Myers (2014) has revealed meditation as a means for connecting with the plant world and for vegetalizing our human senses. Interaction with the non-human world through various mindfulness techniques can emerge a field of reflection, contemplation and strengthening of our relationship with nature.

In our modern, technology-dominatated world, it can be argued that the value of silence, stillness, and solitude have been exchanged for a preoccupation with business, heightened stimulation, and a restless way of living, one where the mind does not have a chance to focus, or absorb the beauty of a landscape, without becoming agitated or bored. Recognizing the impact of a hurried pace in a mechanised and industrialised world, and a constant call to achieve multiple goals, can assist in observing and learning from natural cycles, and slow the patterns of frenetic rhythms which can dominate human lives, and instead reflect the rhythms of nature. The more we can move away from a conventional view of time, and connect with the value of the present a species, while following the rhythms of nature, we can be brought to an understanding of how the future can only exist in the present moment (Coleman 2006).

Mindful Eating

Kabat-Zinn (2016) created the meditation of the raisin (entitled "Eating one raisin: A first taste of mindfulness"), based on an alternative experience of food to cultivate greater mindfulness around eating, and the behaviours associated with it. The challenge of Kabat-Zinn's raisin meditation comes by way of staying in each moment as it is encountered: seeing, smelling, and the holding of the raisin, as the anticipation of eating it, chewing it slowly, focusing on its taste, and swallowing it, means observing, moment by moment, the thoughts and emotions that may arise from the exercise.

Mindfulness has the capacity to assist in staying conscious of the origins of our food, and our connection to Earth, as a species. Hanh (2016) uses everyday eating routines, such as consuming bread or tea, as a means to empower our ecological consciousness. He writes:

> Bread comes from the wheat fields, from hard work, and from the baker, the supplier and the seller. But the bread is more than that. The wheat field needs clouds and sunshine. So in this slice of bread there is sunshine, there is cloud, there is the labour of the farmer, the joy of having flour, and the skill of the baker and then – miraculously!- there is the bread. The whole cosmos has come together so that this piece of bread can be in your hand (p. 12).

In the same way, the ceremony of drinking an everyday cup of tea can be transformed to a mindful practice showing the interconnection between human and nonhuman nature. Mindfulness can teach us that our body is not only our own. It can be seen as something that belongs to our ancestors, and to future generations. Eating mindfully can contribute to the realization that humans are caretakers of our bodies and not the owners if them (Hanh, 2016).

As it can be argued that human happiness and that of the Earth are connected, the question "[w]hat shall I eat today?" is a serious one. Modern methods of food production can contribute to the destruction to large ecosystems. Without staying mindful of the fact that human choices with regards to food, the result can be violent to other species, as well as our bodies and the Earth (Hanh, 2016). Eating mindfully can be a practice that connects to responsible consumption, healthy eating, staying respectful of nature, as well as compassionate and less violent to the larger world as a whole.

Cultivation of Empathy for the Earth and All Living Creatures

The cultivation of empathy for all living creatures should be an essential aim of environmental education, as should viewing the Earth as an extension of our body, as reflected in mindfulness practices.

Bai & Scutt (2009) approach mindfulness practice as:

> An effective way to cultivate a sense of interbeing or consanguinity between ourselves as human beings and all other beings that make up the ecological community that we call earth. Mindfulness practice cultivates subject-object integration and bonding, rather than subject-object dichotomy and alienation. From this integration and bonding flows love of life (biophilia) and deep appreciation of other beings' sacred existence (p. 100).

Mindfulness has the capacity to promote greater empathy toward nature and all living species. The experience of inter-being; the connection of inner life with that of the outside world; and a bodily/mental interconnectedness with the natural world, can be a reflection and praxis of empathy, love and compassion (Hanh, 1993).

As it can be practiced and achieved through mindfulness, focus on the non-dualistic consciousness that connects humans with nature can contribute to the discovery of a better intersubjective connection with nature and the development of a feeling of deep inter-being and resonance with the Earth and its creatures. Approaching the Earth as continuation of one's body can empower

environmental consciousness, along with the will to defend and protect the natural world (Abram, 1997; Bai & Scutt, 2009; Pulki et al. 2017).

Concluding Thoughts

It may be time to underline the need to include mindfulness in the field of environmental education and research to the empowering a sense of interconnectedness with the nonhuman world. Ecological consciousness, respect, defense, and care for all living creatures may not come solely through the transmission of scientific knowledge focused on the environment (Tsevreni, 2011). In parallel with scientific, conceptual, and rational approaches, there is the potential for a broad field to develop around the cultivation of our spiritual contact with the more-than-human world through mindfulness, based on *"a rejuvenation of our carnal, sensorial empathy with the living land that sustains us"* (Abram, 1997, p. 50).

Increasingly, mindfulness is being recognised as an essential tool in educational, with regards to its contribution to the development of bodily and mental concentration and awareness; interpersonal awareness, and emotional stability; reduction of stress and anxiety; and enhancement to the qualities of life like peace, confidence, and joy to be found within it. By contributing to the relief of our disconnectedness from the more-than-human world, and promoting the development of a more harmonious relationship with the nonhuman natural world, the practice of mindfulness through an ecological perspective can support the study of the three pedagogical paths. That have been outlined above. Mindfulness can be utilized to slow the pace of living connect with the Earth, eating with better attention, as well as cultivate empathy and compassion for all living creatures.

As a pedagogical philosophy and methodology, mindfulness has the capacity to contribute to the development of a spiritual human/nature connection, and it can also form the base for a new embodied, and sensual perception and appreciation for the more-than-human world. This could play a vital role in an environmental education built by the empowering a sense of coexistence and solidarity between human and nonhuman beings; an environmental education that aims to cultivate interconnectedness within the framework of a new spiritual and environmental ethos.

Weston (1999) argues that the environmental crisis is a crisis of the senses, of imagination, and of our conceptual world – these are our tools for thinking. In a multiple, many-voiced mosaic of new approaches that attempt to redefine our human existence in a more-than-human universe, mindfulness has much to offer environmental thought, in addition to education, and to the ongoing struggle against the global environmental crisis. This must start by recovering our disconnectedness from nonhuman nature, as well as our own, and nurturing a spiritual bond with all living creatures.

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Notes On Contributor

Irida Tsevreni is an Associate Professor in Environmental Education at the Department of Early Childhood Education of the University of Thessaly. Her research interests include environmental education, critical pedagogy of place, children's participation, holistic education, ecophenomenology, ecocentrism, contemplative education and mindfulness

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Toward a More Eco-Relational English

Estella Kuchta & Sean Blenkinsop, Simon Fraser University, Canada

Abstract
This exploratory paper intends to spark conversation and further investigation into the relational/ecological possibilities of English. English has ecological, colonial, and relational troubles baked into both its structure and usage—issues rarely addressed in environmental education. However, these problematics might be mitigated with playful linguistic adjustments and careful assessments of embedded cultural assumptions. The paper illustrates a number of ways English can move toward greater relationality. Broadly speaking, we work through these potential relational shifts in English at two main levels and five sub-categories: 1) Structure: punctuation, word choice, and grammar, and 2) Usage: form and content. In the end, we suggest that at all levels, micro to macro, the English language can be employed in ways that are more or less relational and ecological. English speakers can make thoughtful and creative decisions about the words used, the grammar employed, and the punctuation engaged. Speakers can also critically examine the cultural assumptions that undergird the "common sense" ways English is used throughout society. Practices for engaging students in these tasks are suggested.

Résumé
Cet article exploratoire a le double objectif de susciter la discussion et de poursuivre l'étude des possibilités relationnelles et écologiques de la langue anglaise. La structure et l'usage de la cette langue sont fondées sur des conceptions écologiques, coloniales et relationnelles problématiques, un point rarement abordé en éducation de l'environnement. Toutefois, ces problématiques peuvent être atténuées en opérant des ajustements à la fois linguistiques et ludiques, et en examinant les présupposés culturels intégrés dans la langue. Cet article illustre plusieurs moyens d'accroître la relationalité de la langue. Dans les grandes lignes, nous envisageons ce potentiel de relationalité de la langue anglaise en proposant des ajustements sur deux fronts : 1) la structure : la ponctuation, le vocabulaire et la grammaire; 2) l'usage : le fond et la forme. Nous arrivons à la conclusion que, tant à petite échelle qu'à grande échelle, la langue anglaise peut être exprimée principalement d'un point de vue relationnel et écologique. En effet, les locuteurs anglophones peuvent user de leur jugement et de leur créativité pour faire des choix quant à la grammaire, la ponctuation et le vocabulaire, et poser un regard critique sur les présupposés culturels entretenus par la langue au sein de la société. Nous présentons également des moyens pour inciter la participation des apprenants à cette discussion.

Keywords: Ecolinguistics, Relationality, English Language, English Usage, Environmental Education

Mots-clés : écolinguistique, relationalité, langue anglaise, usage de la langue, éducation à l'environnement

An Opening Encounter

Tide had already pulled away, leaving Octopus abandoned on wet Sand between slippery Stones. Most of Octopus's limbs had been torn off, perhaps from a seal.

"Do you think they's dead?" I asked my friends, gravely.

"Probably."

"But what if they's still alive? They can't get back to Ocean by themself. And even if not, they might like their body to be returned home." I looked around for seagulls, but they were all occupied, gorging themselves on the abundant mussels.

Disinterested, other Humans turned away, but I didn't want to leave Octopus. Octopus dreamed to me a few years before, so I felt a responsibility I didn't know quite how to enact. They told me to always care for them because their kind embodied a form of intelligence far beyond what humans could currently imagine—intuitively impulsive, creative, and relational (Godfrey-Smith, 2016). I found two large, flat Sticks and began shimmying them beneath their plate-sized mantle. Then, Sticks-Octopus-I ventured awkwardly toward Ocean's edge. We were octopusing in sneakers or humaning with a variety of limbs. Feet made rough conversation with the barnacles. Shore sounded over the stones.

Finally, I set them down in salt Waves with Sticks. They drifted with the lethargy of the dead. There would be no more octopusing that day . . .

Introduction

Estella's story contains numerous adjustments to the English language with the purpose of reflecting and fostering an eco-centric worldview and an ecological ethos. As Daniel Butt explains, an ecological ethos is present when "groups and individuals are motivated to act with non-self-interested concern for the environment" (as cited in Gardiner et al., 2015, para. 1). Shifting beyond anthropocentric concerns for the environment enables humans to think more broadly, creatively, and realistically about the current health of the planet and our responsibility for it. But what happens if the tools available to us to think with, in this case English, themselves potentially limit the changes sought and the possibilities imagined? Since cognition, imagination, and language are indelibly connected, a similar shift beyond the anthropocentrism and alienation is needed in our use of the English language. In the field of environmental education

there has been limited discussion about English itself as potentially part of the challenge toward reaching a deeper relationality. Creeping Snowberry (2010), for example, has suggested thinking more specifically about how language, English in particular, might become more eco-semiotic. While at the same time worrying about what cultural norms are embedded in English itself when it is not sufficiently critically questioned. (Blenkinsop & Egan, 2009)

Beyond environmental education, the English language has been rightly criticized for its unecological features and for promoting conceptions of the world that are inaccurate, anthropocentric, and unecological. For example, Chawla (1991) has criticized English's fragmented sense of time which implies the "march" of technological progress is unavoidable (p. 117). She and others (e.g. Kimmerer 2017) noted that the noun-based feature of the English language is problematic (more about this below). Goatly (1996) identified the ways English is incompatible with contemporary scientific understanding of biology, ecology, and physics. Kimmerer (2017) has identified the ways English reduces the animacy of mountains, sandy beaches, bays, and other beings in ways the Indigenous Potawatomi language does not. Meighan (2020) noted that the noncountable (no singular vs. plural form) word "water" implies an "'infinite' source, or product, which can be ultimately exploited" (p. 84.).

Not only does English reveal persistently unecological modes of thinking and relating, the language and its embedded ideologies have been 'exported' across the globe through the violence of colonization, the enticements of globalization, and other forces. Phillipson and Skutnabb-Kangas (2017) remind us that imperialism "entailed dispossessing Indigenous peoples of their territory, culture and languages, *three indivisible constituents*" and often led to "linguistic genocide" (emphasis ours, n. p.). Wade Davis (2009) warned that humanity is facing "the imminent disappearance of half the extant languages of the world," a phenomenon which amounts to the devastating loss of vast "repositor[ies] of knowledge" (p. 5). Even when English doesn't kill off other languages, it regularly dominates them in fields of knowledge, such as science and technology along with academic journals and conferences. This snowballing of the English language's individualistic, anthropocentric, materialistic, and non-local ways of thinking across the globe has massive eco-cognitive implications.

While these critiques are valuable, focusing solely on criticism of the language amounts to soiling the nest we are living in. After all, English is currently the language of this journal and the primary language for most research and pedagogical resources in environmental education. If English lags in promoting ecological ways of being, it's time to examine our waste management and clean-up our homes. Care, attention, and appreciation for the language may help to renew relationships between the natural world and those humans who are alienated there from. This effort may also allow us to better diagnose what ails us while imagining richer relational ways of being in and with the world.

Many of the astute critiques of English originate in the same foundational issue: English, in its structure and often in its cultural usage tends to promote fragmented, compartmentalized, individualistic, alienated, and object-oriented thinking. To put it another way, at core, English orients toward objects and individuals rather than relationships—or the act of relating. The prioritization of objects may shift speakers' focus toward material, economic, and consumer goals. The prioritization of individuals can lead to hierarchies which in turn motivates competition and the promotion of self-centered needs, often at the expense of others, whether those others are humans, plants, animals, mountainsides, or waterways. In these ways, English provides a cognitive template of the spatial world that is populated primarily by objects and individuals.

Similarly, English provides a cognitive template for the temporal world that is also troubled. English offers artificial disconnections of time. These dynamics occur on multiple levels of the language. For example, "year," "century," and "day" do not contain the same root form, implying a lack of relationship between them. Chawla (1991) argued that because English time words are countable nouns, they are treated "as if they are touch-and-see objects" (p. 256) rather than experiential events with blurred boundaries and complex interdependencies. This disjunction promotes the notion that the past is "over" and can no longer impact the present. In reality, the intertwined atrocities of Indigenous genocide and ecocide reverberate painfully across the continent in the present moment and shadow the future. Rushworth (2020) observed, "Where we wreak havoc in the world comes from how we see time and space, among other fundamental visions" (p. 135). He continued:

> The grammar and the vision are a product of the image of time, the picture that time is given. People can look back on the timeline, back toward the feathers on the arrow, but they do not see Indians in the future, not in the National [American] Mind. The pain of this limited vision is all around us, a deep struggle for Indigenous people, whose internal structures present an altogether different image of time and space." (p. 136)

Object-oriented and individualistic English does not readily lend to reconciliation with land and with the Original-and-Continuing-Through-to-Future Peoples of this Land.

Unsurprisingly, numerous scholars—from new materialists to animists to posthumanists to Indigenous—have identified that a relational worldview is more in harmony with an ecological worldview (Kuchta, 2022, p. 57). The relational worldview emerges from an ontology centered around relationships rather than objects or individuals. Humans exist and can best be understood as a network of relationships. Our contexts, communities, cultures shape, sustain, and create the "I" as it is understood within that frame. There is no detached, autonomous being enclosed by a thin wall of skin. The Earth's gravitational and spatial relationship to the sun creates the conditions for all biological life on Earth to exist.

Scholars in differing fields have leaned into relational ontologies from different angles. Educational Psychologist Darcia Narvaez (2016) spelled out the science of these interconnections when she wrote, "at the quantum level everyone on earth is connected; at the biological level, humans share DNA with virtually every other entity and each person is a community of microorganisms" (p. 8). Ethnobotanist Robin Wall Kimmerer (2013) clarified the relational ontology from the perspective of Anishinaabe beliefs in reciprocity:

> We are all bound by a covenant of reciprocity: plant breath for animal breath, winter and summer, predator and prey, grass and fire, night and day, living and dying. Water knows this, clouds know this. Soil and rocks know they are dancing in a continuous giveaway of making, unmaking, and making again the earth. (p. 383)

In the field of theology, Pierre Teilhard de Chardin (as paraphrased by Delio, 2017) believed, "union precedes being because love is the core energy of evolution and love is intrinsically relational" (p. x). Rather than having to work to prove that all things are connected—as so many of us English speakers do—perhaps we can begin to shift the language and create a more relationally oriented foundation.

Gifts of the English Language

For all its flaws and ugly and ongoing contributions to colonialism and ecological degradation, the inherent gifts of the English language (because *all* languages contain gifts) can potentially be used to respond to and perhaps overcome some of its aforementioned weaknesses. As a language, English is unusually flexible and adaptable. It is unusually forward-leaning. Already the largest vocabulary on the planet (Kimmerer, 2017, p. 128), astoundingly, English adds over 2000 new words every year (OED, 2021). Although we may not necessarily want to encourage this voracious appetite for new words (rapaciousness being an ethical downfall associated with the language), perhaps this keen adaptability can be ethically and creatively guided. This writing identifies some of the features of English that can flex, expand, or adapt to reflect more relational and ecological perspectives. Earlier, we characterized language as a nest because all languages hold their speakers. But in reality, each individual language is a unique species with attributes and features of its own.

Thus, metaphorically, English may be more of a water-strider than a nest. English is light and quick and deft, floating like the strider on top of the water, changing directions with panache, and sparkling in the sun. English skims across semiotic surfaces rather than whirlpooling listeners into the slow depths of history, order, or nuance. Quickness constitutes a different kind of genius, that of spontaneity, nimbleness, even playfulness. Since its earliest days, English has readily adopted words from other languages. Indeed, what we think of

as "English" is a mixed foundation of Germanic, Dutch, and Romance words. This multicultural linguistic foundation naturally lends itself to a multicultural cognitive capacity that might even allow room for expressions, words, usages, ways of thinking that come from more relational depths. Making a relational shift in the language may be possible due to the language's remarkable flexibility, adaptability, and innovation.

This is an exploratory paper, intended to spark conversation and further investigation into the relational/ecological possibilities of English. It is not an invitation to create linguistic obstacle courses that only the most "woke-of-woke" academics can carry out. Rather than offer prescriptions, shoulds, and ought-to's, this paper is an open invitation for everyone to *play* with language in ways that are inclusive and joyful. Yet, what begins as experimentation can take root fairly quickly with the general public when a shift in language is overdue and much needed. Consider, for example, the adoption and mental shift accompanying gender-neutral word changes from fire*man* to firefighter, from post*man* to postal *worker*, and from *he/she* to *they*. Similarly, consider the shift in the national Canadian mind when the term "Indian" in reference to Indigenous peoples shifted to "First Nations" in government documents, political speech, journalism, and education. Words matter. As Haraway (2017) noted, "it matters . . . what thoughts think thoughts, what descriptions describe descriptions" (p. 12).

Broadly speaking, and for the sake of clarity, we see relational shifts in English occurring at two main levels: 1) Structure: punctuation, word choice, and grammar, and 2) Usage: form and content. Of course, the two levels are linked, and our goal is not to further underscore the fragmenting and fracturing—the bits and pieces—qualities of structure and usage English. Rather, we are suggesting that at all levels, micro to macro, we can employ the language in ways that are more or less relational. We can prioritize and facilitate connections and illustrate the linkages that in some ways were always present but were rendered invisible by language. Rather than think of English punctuation, word choice, grammar, form, and content as pebbles in one's hand, consider them as nodes, links, gatherings in a multidimensional web, linking past-present-future, linking semiotics to ontologies, and linking creative intuition to action (Ross and Mannion, 2012).

1] Structure

1.1] Playing with Punctuation

Creative-minded academics in a variety of fields are already playing with punctuation to highlight the betweenness of objects, concepts, and beings. For example, Bayo Akomolafe, a "renegade academic" and Nigerian scholar (Young, 2020), uses dashes to disrupt English-language conceptions of divided, categorical time. Akomolafe writes (2018) that the "*middle-ing space* . . . gives

birth to beginnings and endings" (n. p.), and in doing so, he mends (with a dash and a gerund) traditionally disconnected notions of time in English and clarifies (with an explanation) the overlapping, entangled, and ongoing nature of beginnings and endings.

In addition to time references, scholars and writers are using dashes and joined words to heighten awareness of pre-existing relationships in realms that may otherwise escape notice. With poetic insight, Akomolafe (2018) reminds readers of common but unethical links between biology, law, and racial profiling/implicit bias with another hyphenation: "gut-microbial-courtrooms" (n. p.). He writes, "What stirred in spacetime or squirmed in gut-microbial-courtrooms when that white Starbucks store employee called the Philadelphia police on two black men, who had committed no crime except to delay their orders?" (n. p.). Dashes, in this instance, allow for lightning-quick communication of complex interconnections. Feminist, scholar, and cultural critic Donna Haraway (2016), whose work centers on relationality and "tentacular thinking" (p. 31) makes a similar move when she references "techno-apocalypses" (p. 3), an easily understood concept for readers. In another move, however, Haraway (2016) abandons the dash with similar effect when she refers to "a kind of timeplace for learning to stay with the trouble of living and dying in response-ability on a damaged earth" (p. 2). "Timeplace" is a creative invention that collapses imaginary divides between temporal and spatial realities in the context of climate change and other planetary degradations.

In the same way that dashes and joined words can visually link words, thus, highlighting inherent connections, dashes can also divide singular words to prompt new understanding. Both Haraway and Akomolafe use dashes in this way, prompting pause and reconsideration over familiar words. For example, in the above passage, Haraway divides 'responsibility' into "response-ability," implying that responsibility should not merely be a quiet inward feeling of duty but is about actually *responding* and taking action (p. 2). Akomolafe's use of the dividing dash also implies an action. He writes (2018), "This is why we re-turn to DNA. Because 'it' now unfolds within the Anthropocene—a time of blurred boundaries, a time of noticed confusion when essences and static identities have become untenable" (n. p.). "Re-turn" suggests physical motion—as if physically returning to an unfinished past—and simultaneously spiralling down the down the double helix of DNA, our ancestral inheritance.

Where Haraway and Akomolafe use dashes, marie diane caroline lefebvre[1] (2017), "a scholar of Mohawk and French ancestry," favours parenthetical additions and divisions to similar effect (p. iii). Her cousin to Akomolafe's "re-turn" is the "retu(r)ning" to the essentialness of the natural environment in Indigenous education—an invitation to *return*, to re*tune* the relationship, and perhaps, *tune* into or *re-tune* into those relationships (p. i). Her scholarship was driven in part by a yearning "to (re)connect with the ancestors" (p. 70). Her parenthetical nesting here of "(re)" reminds readers that we are never

disconnected or unconnected from ancestors, though perhaps the connections float below the level of consciousness. In another illustration of parenthetical nesting, she writes of the tall grasses, "I loved how they swayed because I saw them as (m)*Other* earth's hair, a place of (dis)entanglement where I could be both lost and found" (p. 70). With these creative punctuations, lefebvre harkens to the oppression and marginalization of the "other," in this case, the earth. Indeed, the parenthesis in "(m)*Other*" creates a fleeting stutter in the reader's mind, as if there is some discomfort, an acknowledgement perhaps, of the perceived impoliteness of identifying oppression and relating to the oppressed while also likely leaning into quantum physics understandings of "entanglement" between self as mother and other and the familiar grasses. lefebvre draws our attention to her connection with the grass in being and identity, across time and space. But lefebvre's moment in the grass is also one of momentary *dis*engagement, a deliberate cognitive "(dis)entanglement, perhaps from mainstream society, urbanity, and/or the human-made world." Like the wampum belts she writes about, lefebvre literally "speaks to a different or (an)*Other* way of knowing/seeing/reading the world" (p. 73). Her parenthetical nests reveal to readers all that is embedded—the political, emotional, quantum, and metaphysical—within her relationships to earth, grass, words, history, stories, wampum belts, and ancestors.

In Estella's example, "Sticks-Octopus-I" is used to illustrate a momentary unity of direction as, "Sticks-Octopus-I ventured awkwardly toward Ocean's edge." Consider the alternative, written in conventional English: "I ventured awkwardly toward the edge of the ocean, using sticks to balance the octopus." In this writing, "I" is the centre, "I" alone is animated, and "I" alone takes action. This sense of the human as the lone, vital action taker disappears in the subtle use of more capital letters and the omission of the article "the" to underscore the sense of a meeting occurring between and amongst beings rather than *things*. If we write "Tide had already pulled away, leaving Octopus stranded," the feeling is more intimate and familiar than if we write, "The tide had already pulled away, leaving the octopus stranded." "The" turns Tide and Octopus into objects whereas its omission implies a relational intimacy. And, in this example Estella is encountering a particular Octopus, as she might encounter a particular Anika or Aubrey, and not octopuses or humans writ large or as a generic category. Without these considerations the ocean, sticks, and octopus remain mere objects which "I" can manipulate, use, approach, or choose to encounter. If this conventional, object-oriented writing style does anything at all to suggest relationship, it is only to reinforce a belief in human superiority in relationship to non-human ("non" placed here intentionally and not unproblematically) entities. As a creative and relational practice, environmental education students could be asked to take a paragraph of their own writing and rewrite it using punctuation and capitalization to illustrate relationships between beings and concepts.

1.2) Playing with Word Creation and Loanwords

As an unusually expansive and adaptable language, English readily adopts new words, whether creations from English (e.g. craftivist, denialism, idiocracy), combination English-foreign words (farmette), or loanwords from other languages, such these Algonquian words: moose, chipmunk, persimmon (Chamberlain, 1902, p. 240). This multicultural nature of the language is built into the origins of the language itself. On the positive side, it builds on a foundation of diversity and inclusivity, and on the dubious side, that foundation includes an economic orientation and an ongoing colonialist legacy. A relational shift in the English language is not about making a colonialist "grab" at words from other languages and cultures. Rather, it means flexing the structures and making space for other language speakers to bring words and phrasing into English when suitable translations or meanings don't exist. It also means continuing the kind of creativity and flexibility inherent in the language that allows us to say things like: Those craftivists are putting knit bikinis on fir trees to protest climate denialism and the idiocracies that fuel it.

How can the inclusion—whether fleeting or permanent—of foreign words be done ethically? Ho and Chang (2021) illustrate one way. They recognized a gap in practices, concepts, and ideals of North American outdoor education. According to Ho and Chang, white-dominated environmental education programs privilege concepts and practices related to adventure, athleticism, and pristine wilderness, and sideline many immigrant experiences of the natural world such as generational gardening practices and village and urban relationships within the more-than-human. As native Taiwanese Mandarin speakers, they introduce the term *xiang tu* (**鄉土**) to expand awareness of human relationships to land. They explain:

> *Xiang tu* is a unifying concept that captures interconnectedness of people and place, the non-generalizable nature of land. In essence, the land is both people and place. Xiang tu evokes people's memories of home, of belonging, of contact with soil, the sensory cords that tie people to place. Xiang tu is neither wild nor urban, neither an exotic paradise, nor a frenetic metropolis, but instead references the multivalent space of human/land relations in its variegated forms . . . *Xiang tu* points to the nourishing effect of land, of the formative influence of place in the development of person and consciousness. (p. 10)

It would be difficult to imagine a word in English—even a hyphenated collection of words—that cultivates in the mind of speakers such depth and subtly of relationship between people and place. However, even when a foreign word has been presented, it may or may not be offered as a give-away. When in doubt, speakers might simply ask if the word is available for wider use and if their use of the word is doing justice to its original linguistic intent. Even if it is, those who are gifting words and those receiving them may want to bear in mind

that words, just like people, tend to shift in character, often inadvertently and unknowingly, when in a new location.

Haraway (2016) explains another example of a new adopted word: *chthulucene*. Chthulucene presents a more embodied and engaged way to live of this timespace in light of ongoing and catastrophic ecological degradation than the word *Anthropocene* which inaccurately piles blame on 'humans' rather than on particular values and practices of particular populations of techno-industrialized humans. Haraway articulates:

> [C]*hthulucene* is a simple word. It is a compound of two Greek roots (*khthon* and *kainos*) that together name a kind of timeplace for learning to stay with the trouble of living and dying in response-ability on a damaged earth. (p. 2)

Greek is not an entirely 'foreign' language to English, as Greek helped shape Latin and French, which in turn, have helped shape English.

Drawing from her French ancestry, lefebvre remakes numerous English words into more meaningful English-French hybrids. For example, in French, the word "histoire" means both "story" and "history," so lefebvre sets "histoire" alongside "history" to emphasize the narrative aspect of history for English speakers (2017, p. iii). By using "elle" the French word for "she" in "*Elle*mental," lefebvre also links the feminine nature of Mother Earth to the elements (p. i). Environmental education students might be asked to research and consider nature-related words from their own linguistic heritage (such as *komorebi* from Japanese, *hiraeth* from Welsh), and whether, how, and when it might be appropriate to bring those words into English writing and discussion.

1.3] Playing with Verbing

Sometimes it's only possible to understand the character of a language when compared to another. Robin Wall Kimmerer (2017) encountered this experience while trying to learn the Indigenous language of her ancestors: Potawatomi. She reported, "English is a noun-based language, somehow appropriate to a culture so obsessed with things. Only 30% of English words are verbs, but in Potawatomi that proportion is 70%" (p. 130). As Kimmerer points out, the consequence of increased verbing (yes, that is a word) is that beings in the natural world take on greater animacy and, thus, centrality and importance in the collective imagination. In Potawatomi, words we commonly think of as "things" are verbs, such as Saturday, a sandy beach, or a bay (Kimmerer, 2017). "A bay" in English is a static thing, while in Potawatomi, a bay is "being a bay" or, if we may, "bay*ing*."

Kimmerer does not suggest that the English language should adopt Indigenous features, and nor do we. Yet, without trying to mimic other traditions, English may allow for more verbing in its own right. After all, verbing is another fast-moving, adaptable feature of the language. Consider

the many words that began as nouns and became verbs, such as othering, emailing, texting, and adulting.[2]

In fact, might we offer a new verbing word: *humaning*? At a recent conference of outdoor educators, one young academic said she always felt so bad stepping on the grasses. She talked about reducing her 'footprint' on the natural world by eating only vegan food. Another young scholar looked unconvinced. She explained (we are paraphrasing): 'Bears can walk on the grasses. Lions can hunt and eat prey. I'm allowed to be a human and do human things.' *Humaning* means wrestling with these kinds of questions. It means making environmentally-minded but possibly incorrect choices, such as returning a severely injured or deceased octopus to the ocean. The word clarifies that being human is a changeable, challengeable, and processional state, open for debate and change, by no means static or fixed. It means wrestling with what it means to be human or do humaning well in relation to all our kin, human and the rest of burbling, buzzing, basking denizens on this planet. It means trying to hold to a sense of obligation to Nature's other beings, with recognition that humans are fallible and don't always make the right choices even when trying.

Environmental education students can likely readily think of many examples of *humaning*. And they might be asked: What additional nouns might be shifted from static to active forms through verbing? How can adding -ing illustrate additional ecological on-goings, beingness, and relationships?

2) Usage

2.1) Examining cultural assumptions and the problem of N(n)ature

It has long been noted in feminist circles that to position women using natural metaphors is often done in deeply derogatory ways (Plumwood, 2002). Patriarchal language finds ways to first separate, often through binaries, and then associate the female with other "lesser than" beings thereby reifying male superiority. The same move is easily noticed in relation to other, often non-English language, cultures as the colonizer searches for power over. For our purposes here this is problematic for two reasons. First, the intentional use of language as a means to denigrate any other groups of humans is problematic and certainly doesn't support relationality. And second, the cultural assumptions built into these moves often don't even allow the question of why being metaphorically linked to the natural world is derogatory. For what is so wrong with being an ass, a snake, a wallflower, a dog, and so on? And, how do we come to notice these assumptions and better yet, find ways to change them?

As in all languages, many cultural assumptions are built into the form of the English language. For example, the natural world has been positioned and articulated in heteronormative ways—and then that positioned heteronormativity is used to "prove" or affirm those assumptions. This is a kind of manipulative

bridge-burning tautology. Mortimer-Sandilands's (2010) research in this area examines how biology, for example, laced with heteronormativity has supposedly "found" gendered behaviour throughout the animal world. For example, male researchers will focus on the "dominant" heterosexual behaviour of the silver back gorilla and not notice all the other goings on between and amongst the rest of the troop. Subsequently, this limited vision is picked up by the mainstream culture and used as a linguistic weapon against LGBTQ2S+ populations suggesting that they are "unnatural" even though, as many other researchers have been pointing out, the diversity of gender expression and sexuality of the natural world, or even that particular troop of gorillas, is certainly not normed to some monogamous heterosexual Truth.

These examples are striking, but less obvious forms of English also maintain alienation. Forests are seen as a "resource," open plains as "bread-baskets," and herds of deer and antelopes as "game." However, the obvious example in ESE involves the words used for all those beings around us that are not human. The binary language of nature and the environment have been rightfully critiqued as furthering and sustaining this problematic alienation of humans from the world. Binary language is also a colonizing way of lumping immense diversity into a single category in the way settler colonial cultures have done for centuries with diverse communities (Blenkinsop et al, 2017). For example, gathering an entire continent of diverse peoples, cultures, languages, and ecosystems into a single word "Africa" and then making overgeneralized or power-over statements therewith. This said, we are still challenged to find something to adequately position humans as being *part* of the world, not separate from or better than. Abram (1996), for example, tried to do this work with the term *more-than-human*. However, the result has often been to simply use it in place of *environment* or *nature*, which was not Abram's goal and is a misuse of the term as he envisioned. Our little nod in this direction, for example, is to acknowledge the particularity of the encountered Octopus in the opening of the introduction with a capital.

Finally, we might consider the form of the typical English essay, a structure that contains an externally-prescribed organizational pattern. This form does not reflect the diversity of available communication, but rather promotes homogeneity, dependency on a singular style that sorts, almost immediately, those in the know and those that aren't but that also leans towards a kind of objective argumentation no self-respecting hummingbird would countenance. Alternatively, English writing projects could be "transformed by ecological principles" in order to "acknowledge our ecological interconnectedness" (Englehardt & Schraffenberger, p. 273), such as Tsing's book chapters blooming like "flushes of mushrooms" (2015, p. viii), Kimmerer's stories woven like sweetgrass (2015), and Powers's old growth interdependencies (2018). Traditional essays are largely structured for reader efficiency, to allow for skimming and quick consumption. But efficiency and consumption are problematic features

from an ecological perspective. The typical English essay structure also hints at colonialist tendencies since it makes a 'claim' almost as soon as arriving and unwaveringly fulfills that claim to the end.

Instead, students could be asked create diversified writings inspired by the organizational design patterns of foxglove, ocean waves, or bee dances, wherein "introductions," for example, are replaced by conceptual "stems," "primary rhythms," or "waggle angles." For further inspiration, students might read Noel Gough's "RhizomANTics," which plays with rhizomatic thinking, posthuman pedagogies, and, of course, ants.

2.2) Examining Kinship terms, favoured sayings, and the question of "It"

A number of creative possibilities exist that emphasize a relational ontology in English. For example, Chawla (1991) has reminded us that many Indigenous languages use kinship terms in reference to more-than-humans (p. 118). Among the Cherokee, the "new moon is addressed as grandfather," while "Among the Pueblo, the sun is the father . . . and the earth is the mother" (Chawla, p. 118). These are not likely "anthropomorphic" descriptions in the true sense of the word, as Chawla once suggested (1991, p. 118). Rather, they are suggestive of a depth and quality of a very real relationship, similar to how Indonesians might refer to beloved older men as *Bapak* ("father") and women as *Ibu* ("mother"). The term is a sign of respect, a recognition of the relationship that is possible, and an openness to that relationship—not an attempt to claim a biological relationship.

Again, the point is not to imitate the speech of Indonesians or Cherokee. In fact, those are exactly the kind of superficial, self-serving enactments that echo English's long history of colonialism. Even a term frequently used in English, such as "Mother Earth," can be problematic depending on the context and speaker. After all, in North America, mainstream culture tends to sideline and devalue mothers. On screens and other media, mothers are often portrayed as unattractive and undesirable but endlessly self-sacrificing women who strive—or should strive—for heroic parenting feats at the expense of their own needs. Food appears, laundry is done, waste is removed as if by magic and the "family" neither notices or cares for the doer nor worries that mother might become exhausted and incapable of keeping this up. Referring to the planet as "Mother Earth" may, sadly and accidentally reflect how much she does for us with little to no recognition. When used without conscious thought by the dominant culture, the term may be accurate but not remotely ecological. It offers nothing for many individuals in terms of decentering the human and aligning with a more ecological relationality. The point is that more attention can be paid to the implied content of the words we use.

Individual English speakers might look honestly at their own relationships to the natural beings around them and consider what linguistic adjustments might authentically reflect and serve those relationships. For example, in writing about octopus, "they" was used instead of "it" to underscore a felt closeness and as

recognition of Octopus's rights to be known as they might desire. Environmental education students might be asked to engage in this as an exercise: What terms, verbs, and phrases most accurately articulate your relationship to the natural world—both the actual relationship and the ideal?

Finally, we want to identify some playful possibilities that English might provide as it moves toward greater eco-relationality. For example, while considering this paper we wondered, in an attempt to reverse the use of natural beings as human insults, what taunts our natural kin might use on each other. Jellyfish might notice how a friend moved as if it had a *skeleton* or Mouse might point out the worrisome human-like shoulders on a sibling or Cheetah laughing at its mates slow two-leggedness. This flip in frame has become a useful tool in many of the classrooms we work with as teachers and students re-think expressions – "killing two birds with one stone" – in more ecological forms – "feeding two birds with one hand." Students can be asked to consider other ecologically problematic idioms and suggest revisions. Teachers can also change the stories they read and tell (Blenkinsop, 2010) in order to undo myriad manifestations in language of these alienated, hierarchical, and species elitist cultural assumptions.

Conclusion and Caveats

Moving toward a more relational English in whatever manner can reveal challenges while also centralizing inherent relationships that may otherwise fly under the radar in standard English communication. These ecolinguistic moves can potentially emphasize the wholistic, nonlinear nature of time and highlight inequities and injustices. They offer a shorthand way to relay complex concepts to readers with brevity and fleetness. They clarify how meanings and matter lean into each other and share space. On the other hand, not all creative linguistic changes highlight relationality—at least not in the ecocentric relational ontology sense. And many ecolinguistic moves may begin a process but, upon further review, may themselves be changed or even retired.

Loanwords from other languages need to be handled with care. The same can be said for "adopting" Indigenous kinship terms in reference to Nature's many beings. Although loanwords and kinship terms illustrate meaningful ways to enrich the relational capacity of the language, ethical issues of appropriation and misuse are risks. On the other hand, drawing from one's own heritage or the linguistic origins of English can be a playful and rewarding way to expand the cognitive carrying capacity of singular words, sayings, and metaphors.

Environmental education students can play with language by writing their own Octopussing tales. In doing so, they might be encouraged to play with punctuation, capitalization, word joining, verbing, and other flexes of the English language. They might counter colonial practices and enact ongoing reconciliations by identifying the origin of loan words and giving thanks for

those gifts as well as recognizing the inherent link between words and place. They might find ways to decentralize the human "I" and foreground the often backgrounded stories of flora and fauna. In doing so, they might experiment with diverse modes of expression; rather than writing traditional "essays," for example, they might creatively craft literary versions of iris blooms, dragonfly wings, or wind patterns by rethinking direction and theme along with the structure of sentences and paragraphs, and overall organizational design along ecological principles.

Of course, not all language experiments survive. Even promising, much needed, and well-considered linguistic experiments (shout out to all the "zhe" fans!) sometimes fail to take root. In addition to the obvious ethical pitfalls of carelessly appropriating from other languages and cultures, shifts in English risk coming across as trite or gimmicky. Perhaps even worse, they risk becoming exclusionary; meaning, English and the politics surrounding it are changing so rapidly, sometimes only those on the very cutting edge know what's going on. Meanwhile, those who haven't gotten the latest memos can be unfairly chastised, excluded, and called out. If we're going to open up the invitation to play with language, let's make sure everyone is invited into the party, no matter how recently they arrived. After all, what's the point of becoming more relational if it results in more exclusion? If English has been an unwitting vehicle for oppression—of peoples, Nature, and places—then the reconciliation necessarily involves more liberation for all.

Notes

1. A side project for you the reader: Consider lefebvre's choice to lower case their name.
2. Sean and Estella have recently co-authored a book called Ecologizing Education although "ecologizing" is not officially part of the OED yet.

Notes On Contributors

Dr. Estella Carolye Kuchta teaches literature, composition, and research writing at Langara College in Vancouver, Canada. She is the coauthor with Sean Blenkinsop of *Ecologizing Education: Nature-Centered Teaching for Cultural Change* (Cornell, 2024). Her ecocritical research into Canadian love stories resulted in the novel *Finding the Daydreamer* (Elm Books, 2020). She has worked as a research assistant to Dr. Gabor Maté (MD), an editor for Susila Dharma International, and an intern for the CBC Radio, and is a long-time member of the International Love Research Network. Her doctoral research investigated the epistemological potential of love and the redefining of love from an ecological perspective.

Sean Blenkinsop is a professor in the faculty of education at Simon Fraser University. Current research explores teacher education and imagination, school and cultural change, nature as co-teacher, and eco-social justice. Sean has long been involved in creating and researching innovative public eco-elementary schools. Most recent books are: *Wild Pedagogies: Touchstones for Re-Negotiating Education and the Environment in the Anthropocene* Palgrave-McMillan (2018); *Ecoportraiture: The Art of Research when Nature Matters* Peter Lang (2022); *Education as Practice of Eco-social-cultural change* Palgrave-McMillan (2023); and, *Ecologizing Education: Nature-Centred Teaching for Cultural Change* Cornell (2024) which gathers learnings from these schools.

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Getting There from Here: Mapping as a Process for Relationship Renewal

Jennifer MacDonald, University of Regina, Canada

Abstract
Inspired to guide students toward more ethical relationships with the living world, this article looks at maps as a common tool used in outdoor environmental education. I argue that maps are tools laden with European Enlightenment ideologies and reinforce a type of human being who has lost their way within an ecological web. To balance these understandings, I offer a process of mapping that was shaped alongside students during multi-day outdoor learning experiences. Through sharing student-generated examples, I offer insights for how a more interpretive means of mapping (and unmapping) through experience can support students to situate themselves within place-based ecologies as a form of relationship renewal.

Résumé
Dans le but de renforcer la relation éthique des jeunes avec le monde vivant, le présent article s'intéresse à la cartographie comme outil couramment utilisé en éducation à l'environnement en plein air. Il soutient que les cartes sont chargées d'idéologies de la Renaissance européenne qui reflètent, entre autres, la conception de l'être humain égaré dans un dédale écologique. Pour illustrer ces propos, je présente une expérience de cartographie effectuée auprès des jeunes lors d'une sortie éducative en plein air échelonnée sur plusieurs jours. Les exemples tirés de cette expérience révèlent comment l'intégration de moyens interprétatifs encourage une symbiose renouvelée dans une écologie territoriale.

Key-words: Maps; Mapping; kinship; relational process; place-based ecologies

Mots-clés : cartes, cartographie, symbiose, processus relationnel, écologie territoriale

How might students be guided to build healthier and more ethical relationships within a living world? The question is pressing in the era of intensifying climate change, immense biodiversity loss, and initiatives meant to promote truth and reconciliation between Indigenous and Canadian communities. As a non-Indigenous educator who is passionate about outdoor and environmental learning, the subject of relationality opens both critical complexities and creative possibilities within the entanglements of identity, story, place, and responsibility.

Papaschase *nêhiyaw* (Cree) scholar Dwayne Donald (2019; 2020; 2021) illustrates how dominant curricula are derived from European Enlightenment ideologies that inherently deny relationships. This denial is naturalized in teaching

and learning due not only to the limited opportunities to understand differences and build relationships between worldviews (i.e., meaningful interactions between Indigenous and Canadian communities), but also due to the Cartesian split that privileges the cognitive, intellectual mind over the rest of the body, as well as structures that negate interactions between human and more-than-human kin (in that most formalized learning happens indoors). As I examined my own approach, I was led to grapple with the colonial underpinnings of my pedagogy, which exist despite my well-meaning intentions to offer outdoor experiences to students, and my belief that something profoundly important happens when doing so. That is, while being active outdoors, we were on pre-determined paths with little concern for who has been displaced from that land or for the rhythms already pulsing within the flow of our experience (MacDonald, 2020). So then, how might we navigate experiences otherwise, to acknowledge that we already exist as kin within place-specific networks of relationship, and that, as human beings, we have responsibilities to contribute to the continuation of life for all?

One tool that humans use to find their way is the map. Beyond the paper map, I understand that we navigate the world with a variety of maps, and that maps come in a variety of forms. Both literally and metaphorically, maps provide direction for understanding the past, present, and imagined future. Various worldviews offer particular maps, curriculum and school structures provide another, while histories, languages, and family lines curate yet more maps. Even this article – in its research, content, and format – is a map informed by academic directives that make certain assumptions about what counts as knowledge and knowing. We are all guided by a unique variety of maps that consistently work on our relationships with and in the world.

Often unquestioned in my experience was the function of maps as representations of place, and how these representations might impact experiences in outdoor and environmental learning. Growing up, I was enthralled by maps. In educational contexts, however, most attention was on the map of Canada – memorizing names and locations of the provinces and their capital cities. The map on the wall in one classroom had a permeant pin to show our location in eastern Ontario. We shaded in bodies of water and made symbols to represent certain details, on which we would have weekly quizzes. I was a perfectionist and strove to make my maps neat and to always stay within the lines. As an educator now, I wonder what I learned from these tasks around being a responsible citizen in the place where I lived. Today, I use the same maps to facilitate more nuanced discussions about issues of colonialism. For example, what names and stories are present on the map? Whose stories are missing? How does such an incomplete representation impact how we perceive and relate with the world? Practically, how might these representations influence how we move through and with place?

In this article, I argue the ongoing need for educators to unpack taken-for-granted practices that deny relationships. Equally, we must seek and enact

guidance for proceeding differently; that means, in my case, to encourage more sensuous and embodied participation as part of a "sacred ecology" (Abram, 1996; 2010; Cajete, 1994; Donald, 2021; Sheridan & Longboat, 2006). In what follows, I share how maps are central to my work in both tasks. First, I describe how maps are commonly used in outdoor education in ways that naturalize ways of knowing, being, and doing that are embedded in the colonial project. Inspired by the emergent field of "counter mapping," I turn to inspiration from a Treaty 6 Elder on how we might proceed differently. I introduce a practice of mapping that was developed with a group of students in a wider study on how students interpret the living world in outdoor learning programs. Finally, I share four student-generated maps that highlight the ecological characteristics of a kinship worldview, whereby all is alive, related, and interdependent, as a way of promoting renewed relations (Donald, 2021; Topa & Narvaez, 2022; Van Horn, Kimmerer, & Hausdoerffer, 2021).

Understanding and Resisting the Colonial Legacies of Maps

Maps influence how we see, interact, and experience the world. Modern maps, as Chellis Glendinning (2002) specifies, are a product of imperialism, stemming as much from early European endeavours to accurately survey and chart unknown terrains for the purposes of settling, controlling, and owning land, as from present-day dynamics of the global economy that persistently divide and commodify land. Glendinning writes that we are part of "relentless mappings that isolate us from our own humanity" (p. 6). David Turnbull (2000) also articulates how modern cartographic practices ignore other knowledge systems. He writes:

> The development of 'scientific maps' has come to be identical with a progressive, cumulative, objective, and accurate representation of geographic reality, synonymous with the growth of science itself .... We are blind to the processes by which the social is naturalized. Maps have boundaries, frames, spaces, centers, and silences which structure what is and is not possible to speak of. (p. 95-99)

The assumption here is that maps already represent the world as *real* and can tell us exactly how to see and move through places. All humans need to do in this case is match symbols and illustrations to their surroundings. However, this notion of what is 'real' discounts that humans come as storied beings with abilities to interpret and make meaning through bodily knowing.

In outdoor learning, reading and using maps are foundational skills that are taught early, fine-tuned, and progressively advanced to more complex systems of navigation. In my experience, a starting point is to have young students identify landmarks by comparing the map to what the students see in the *real* world – thereby already positioning the students as separate from the surroundings. Techniques are scaffolded, and eventually students use topographic maps, with

their features of coordinate grids, contour lines, scales, and legends, to learn how to read coordinates, follow bearings, and systematically triangulate their locations and navigate to others. In more advanced assignments, students generate detailed "time-control plans" whereby they map out desired routes with co-ordinate checkpoints and estimated times to complete each leg of the route. Doing so, as I have seen, prompts students to obsess about time; consistently thinking ahead and rushing from place to place to meet their pre-planned goals.

Of course, these skills provide safety training within wilderness travel contexts for several reasons: to know where you physically are, to know how to get where you want to go, and to be able to provide a precise location in an emergency. In my experience, however, the mastery of these skills is a fixed and unquestioned part of what happens in the curriculum of many programs. The problem that arises for me, is that humans are not separate from the world. We already participate in much more complex processes than just matching identifiable landmarks from the map to our surroundings. Employing maps without reflection serves to position students as observers of static spaces and asserts a sense of "placelessness," whereby local ecologies are not honoured as unique "living relatives" (Donald, 2020, pp. 158-159).

My concern that outdoor learning pedagogies are entrenched in colonial logics is not a new issue in the field of environmental education. Emily Root (2010) showed the complexities that white environmental educators face in recognizing Eurocentrism to decolonize practices. Other studies also wrestle with the problematic ways that place is mediated through outdated activities and advancing technologies, amid claims of promoting place responsiveness and values of sustainability through direct experience. For example, Allen Hill (2013) articulates how adventures in wild places separate students from local places and impact sustainable everyday behaviours, where Brian Wattchow and Mike Brown (2011) confirm my observations that orienteering practices encourage a focus on tools rather than place-based encounters. Chris Loynes (2020) traces the widespread navigation activities used today back to curriculum that centered around character development, which originated in the post-war Boy Scout Movement. Here, reliability, accuracy, fitness, and team spirit were valued highly and were not necessarily intended to promote place-responsive education. Sharing similar concerns as myself, his study compared how students in two groups navigated the same terrain: one with maps and compasses, and the other without. He found that students without navigational tools attended to the natural features for direction and expressed the intrinsic meanings of their experiences, where students with the mediating tools got caught up in the goals of the task and objectified the landscape through focusing on human-made features.

My interest in unlearning the problematic cultural values entrenched in maps has led me to the growing field of "counter mapping." This field offers forms of cartography that challenge dominant power structures and centre Indigenous, feminist, and racialized communities in the creation of alternative maps (Orangotango+, 2018). For example, scholars and artists have created

maps to resist colonialism and promote social justice (Hirt, 2012; 2022), practiced "performance cartographies" of oral cultures (Oliveira, 2019), extended imaginations through creative expressions of different experiences (Berry, 2011; Harmon, 2003), and have given meaning to invisible layers of connection, such as the ever-changing dynamic of cityscapes (Solnit, 2010; Solnit & Jelly-Schapiro, 2016; Solnit & Snedeker, 2013). A map art project led by Zuni artist Jim Enote caught my attention due to the relational ways in which the map art illustrated possibilities beyond the birds-eye grid view of the land (Loften & Vaughan-Lee, 2018). Based on the notion that modern maps confuse and disorient people, his maps honour the local knowledge system and ancestral stories of the Zuni River Valley through documenting vignettes of experience. While I am not Zuni, nor an expert of Zuni ways, I was inspired by the relational ethic embedded in his approach, and wondered how students in my setting might engage other forms of being and knowing to think beyond the grid map.

Drawn to counter maps as an approach to document expressions of place as perceived and experienced, I wanted to broaden how maps are used by stretching the imagination of what a map can be, and to position students differently – as participants within a living web of relations, in dialogue with various lifeforms. I was interested in a different kind of map, which led to considering different processes of mapping with students.

Turning to Kinship and Mapping

A struggle for me as an educator is that conversations about background maps – the traditions and pre-understandings that govern values, actions, and relationships – become too abstract. For years, I felt resolved to show others how problematic structures continue to separate humans from healthier ecological relations. This critical frame achieved some of what I intended, and helped expose some challenges, but also created resentment and tension amongst my students. My approach, I see now, was ill-guided, as it did not provide any guidance for other alternatives. For me, the pedagogical task became how to best support learners to question their background assumptions, to then undertake processes toward life-sustaining wellness for all. To do so, it was essential for students to experience and generate understandings for themselves.

In 2016, I was a graduate student in a course through the University of Alberta, *Four Direction Teachings: A Holistic Inquiry in Support of Life and Living*, where I was introduced to Elder Bob Cardinal. This course followed the 13-moon teachings of the nêhiyaw calendar through monthly meetings. Our gatherings took place at Elder Cardinal's ceremonial grounds, and we began each session with smudge, shared in circle, listened to Elder stories, and had opportunities to participate in ceremony and spiritual practices. Through different learning processes, the course engaged us with wisdom principles of *miyo-wîcêhtowin* (good human-to-human relations) and *miyo-wâhkôhtowin* (good relations with

all living beings). Coming into relation with Indigenous teachings was hugely significant. There were many lines of inquiry that surfaced for me, making it hard to pinpoint what made the whole so meaningful. I was not merely learning about Indigenous ontologies, epistemologies, cosmologies, and axiologies passively through lectures or reading assignments through the filters of my own worldview, I was actively participating in them.

By learning to balance insights from all four directions (emotional, spiritual, mental, physical) in my life, I started to experience the world differently. It is not my purpose to position myself as any kind of expert in Indigenous knowledge, but I learned that the teachings are something that I am a part of as a human being. Elder Cardinal encouraged us to carry the wisdom in our own ways and in our own contexts. Thus, I see that the work of bettering relationships is not solely the obligation of Indigenous peoples; we all have roles and responsibilities. Donald (2021) refers to this as kinship relationality. He writes:

> Following the relational kinship wisdom of wâhkôtowin, human beings are called to repeatedly acknowledge and honour the sun, the moon, the land, the wind, the water, the animals, and the trees (just to name a few animate entities) as, quite literally, our kinship relations, because we carry part of each of them inside our own bodies. Humans are fully reliant on these entities for survival, and so a wise person works to ensure that those more-than-human relatives are healthy and consistently honoured. (p. 59)

The key insight that I wanted to carry forward was that place-based, ecosystem-specific lifeforms that support human life and living can guide all of us if we let them in and attend to them. Within this wisdom, I pictured students already arriving with a sort of holistic atlas – as direct, sensuous, and embodied knowing – that they can learn to read and understand more deeply, and that connects them with ongoing relations.

Tim Ingold (2000) draws important distinctions between map-using (navigation), mapmaking (cartography), and mapping (wayfinding). All of them have a purpose and function in outdoor learning, yet mapping caught my attention as transformative in ways that were underexplored in the field. He writes:

> The traveler or storyteller who knows as [they go] is neither making a map nor using one. [They are], quite simply, mapping.... wayfinding might be understood not as following a course from one spatial location to another, but as a movement in time, more akin to playing music or storytelling than to reading a map. (pp. 231-238)

Aligning with kinship relationality, and my learning from Elder Cardinal and Dr. Donald, I saw that students needed to be brought into a process of knowing as they form understandings of their relationships. Rather than focus on how students might generate counter maps of a place, which I see as an alternative representation of life within the grid map, I wanted to bring students into the fold of attending differently to moments of felt connection to then generate the

map. Therefore, in my study I considered mapping as a relational process for students to build meaning and story within a kinship network.

Bringing Students into a Relational Process

The mapping I share in this article surfaced within a hermeneutic study inquiring into student interpretations of the living world during outdoor learning programs (MacDonald, 2022). Ethical Approval for this study was granted by the University of Calgary Research Ethics Board. In this project, there were two interconnected journeys brought into dialogue to inform the whole. One journey was my continued learning with Elder Cardinal who I met with during the research process. When I asked for his involvement, I explained to him what I saw, in his terms, *kîkwaya e-patahaman oma* (What is missing?) in my outdoor learning contexts. I spoke to him about wanting to bring students into a relational process and to centre more holistic ways that acknowledged life and living in places we visited together. I asked for direction around how, as a non-Indigenous educator, I might ethically guide students who were predominantly non-Indigenous, white, middle-class, from an urban centre, and who might have no previous experience seeing the world in this way.

The other journey was travelling with 16 secondary school students (11 female, 6 male) in two different courses as part of a school-board outdoor education program. One course (with students finishing grade 9) involved an eight-day canoe trip in Killarney Provincial Park followed by a seven-day backpacking trip in the Adirondack High Peaks of Upper New York State. The second course (with older students finishing grade 12) was a 28-day sea kayaking trip along the shorelines of Anticosti Island in the Gulf of St. Lawrence. On these trips, I gathered data on the experience by taking fieldnotes (both textual and visual), facilitating semi-structured interviews and group conversations, and through examining the student-generated maps.

Prior to meeting the students, Elder Cardinal told me that the work ought to begin with the students knowing who they really are. In a holistic way, they must get in touch with the sacred within to understand their purpose within a greater web. He encouraged me to share stories of my learning and to allow space for struggle within the process. Additionally, he said that the spirit needs to be remembered as it is often overlooked in any schooling context. The spirit, as he described, cannot be boxed in, because it flows through the lifeforce of different connections, always in flux, and its meaning will come as a mystery. Introducing more relational ways was not about restructuring the entire program to fit my purpose (for example, not going map-less), but to see how holistic elements were already alive and to make them more accessible to students. Therefore, keeping this guidance in mind, I wanted to see how mapping might co-exist within pre-existing programs to expose students to the web of relations already present.

Proceeding with this guidance alongside students, I knew mapping would be part of the study and I had an idea of how it might work prior to the trips, but the process emerged as I learned what worked from the students. Throughout the study, mapping took different forms as I played with different variations. In Killarney, I knew students were introduced to map and navigation concepts in the first days of the program. I presented the mapping activity toward the end of the trip as a way to contrast the navigation skills they learned with a different understanding. I started by reviewing map features and we discussed how the map of the park might work on us to determine how we experienced the park and thereby standardized our relationships. I encouraged students to pay attention to information from all their senses. I also prompted them to reflect on what caught their attention and what stories surfaced to make their experience meaningful. They completed their maps independently during their solo sit, a time when students are alone in a sit spot. Afterward, students were excited to share their maps and it was interesting to see the variety in how students took up the task. For example, one student created a symbol to represent their highlight from each day, while another student generated a circular shape to represent the route that we took with trees reaching out to help us along the way.

From this foundation, for the next part of the course (in the Adirondacks) we moved to mapping each day. I wanted the process to encourage dwelling within the kinetics of the experience, and for students to recognize moments of felt connection as they were occurring, instead of framing the map as a glorified reflection exercise. Students were prompted to attend to moments that caught their attention – when they felt connected or drawn to an encounter – during our various activities. Each evening, they were asked to add to their map as a way of mapping their connections as we went along. This approach was not as successful; in contrast to the first session in Killarney (when students generated maps in solitude), they were influenced by how their peers took up the task. When I asked students for feedback, they commented that doing the activity in the tent at night (necessary due to bugs and rain) was difficult because it led them to compare with each other and discuss the day together. Students also shared that it was difficult to recall specifics of deeply felt moments once they were removed from the occurrence.

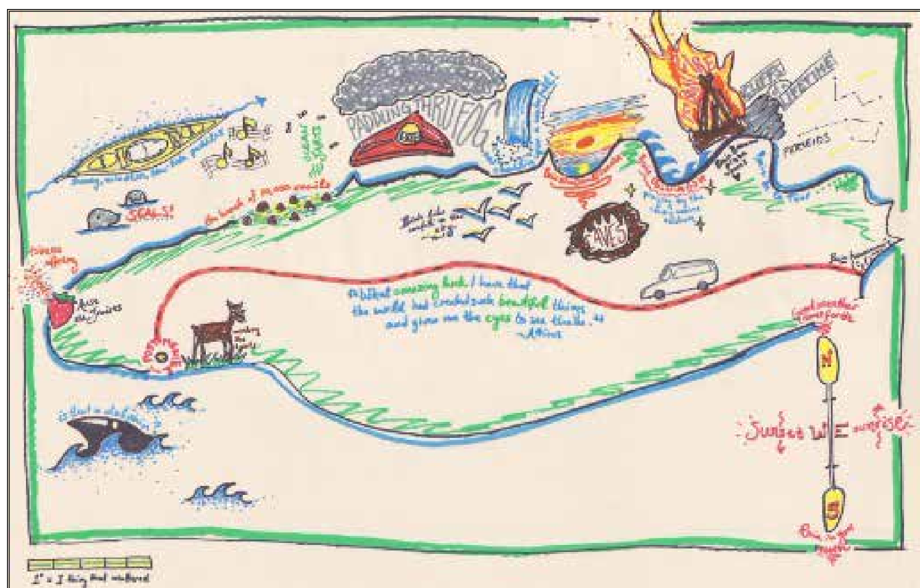
For the longer Anticosti trip, I wanted build on what I learned in the first program and combined both approaches. Students were asked to keep field notes along the route, paying attention to moments of “feeling fully alive.” This prompt arose during the Adirondack trip through one student’s enhanced perception of aliveness. During our debrief discussions, I learned that this sentiment resonated with students and invited them into the type of holistic experience that I was after. The field notes were not structured, but each student kept notes in a way that made sense to them. At the end of the trip, students then used their notes to look back on the whole of their experience. They were then tasked with creating a map to capture their experience holistically, including which aspects

of the maritime ecology struck them the most. Students completed the activity independently while I was having one-on-one conversations with each of them to debrief the trip. Students continued to work on their maps on and off for two days before our final sharing circle on the day we left the island.

Prior to sharing, I asked each student to identify a question that their map was asking them to carry forward as they returned to their daily routines at home after the trip. This was inspired by Gadamer's (1975/2004) "priority of the question," whereby a text (in this case, their map) presents a response to a question (p. 370) and was meant as a practice to translate their experience to their everyday lives. Their recollection of the question that their map asked of them provided me an access point to begin conversations during our follow-up discussions four months after our return from Anticosti.

Expressions of Mapping

In this section, I present four examples of the student generated maps from the Anticosti trip. To honour the students' voices in sharing their stories, experiences, and connections, each map is accompanied by two blocks of text: first is their description of the map (transcribed from the sharing circle prior to departing Anticosti) ending with their question to carry forward, the second is their response to the question collected during our follow-up conversation four months after the trip.

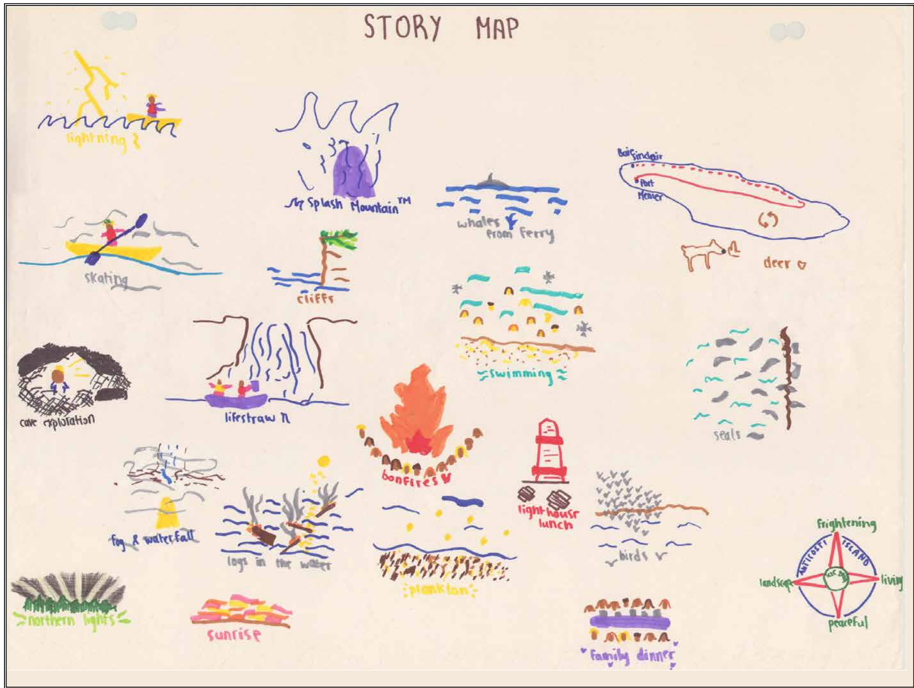


Fiona: Events of Encounter

My compass rose is a paddle; north it says, “good weather come forth” and south “rain in your mouth” then sunrise and sunset for east and west. I go along the shoreline mapping out unique moments. Starting with the whale we saw on the ferry. It was my first moment foreshadowing how connected I’d feel. There was the paddling with the seals, then the sunny windless low tide paddles where we just chatted the whole time. The beach of 10,000 seals and the smell of the ocean…. paddling through the fog and we went through big patches of birds that would just fly off all at the same time and look like confetti in the sky…. The fog turns into stumbling onto a waterfall. The sunrise at Baie MacDonald, the caves, the massive waves onshore at Baie Observation. Creating ovens that day at Baie Beacon felt like nature telling us that everything we need is here, you can just make things by using your hands, or you can just make do with what you have. Those incredible cliffs that we saw, the meteor shower, the early morning hike. There was a line from a poem in the instructor’s book that I took to heart: What amazing luck I have that the world has created such beautiful things and given me the eyes to see them. This map is asking me: *How will I find space in the noise of my mind, in the day-to-day life, to be with the quiet of nature?*

* * *

I need to make the effort, and I’ve learned it is not just in the present, but also making plans that involve seeking out quiet…. I think that’s how it will become ingrained in how I build my life. Since the trip, I find that there is not enough promotion of quietness in school. In the university context now, I’ve found there’s a lot that promotes critical thinking, and that can breed that quietness in a sense that it feeds your ability to just think, and to not just let yourself think, but specifically to think about why you’re thinking certain things and why you have certain preconceptions. This has been absolutely life changing and built on our way of being on the trip. We learned to ask “why” all the time. I’ve learned to think about my assumptions about needing to be busy, our assumptions about the economy and how things should be about what we should care about…. More than that though, the quietness comes in being optimistic and focusing on the body…. Outside of outdoor education, my studies are absolutely immersed in the mind. I’m reading a lot, and I’m writing a lot, I’m thinking a lot and I don’t know how much I’m experiencing. And a lot of it is, like, “Here’s why we’re doing everything wrong and why everything is going terribly.” And I’m trying to look more towards acknowledging what needs to be done. We don’t have to just despair. We should be outraged that has happened, and that we’re allowing it to continue in our own lives, we are doing things that are unsustainable, but we should still have hope. I didn’t always think this way. I didn’t always care about sustainability the way I do now. If I was able to change how I think, I think that means anybody else can.

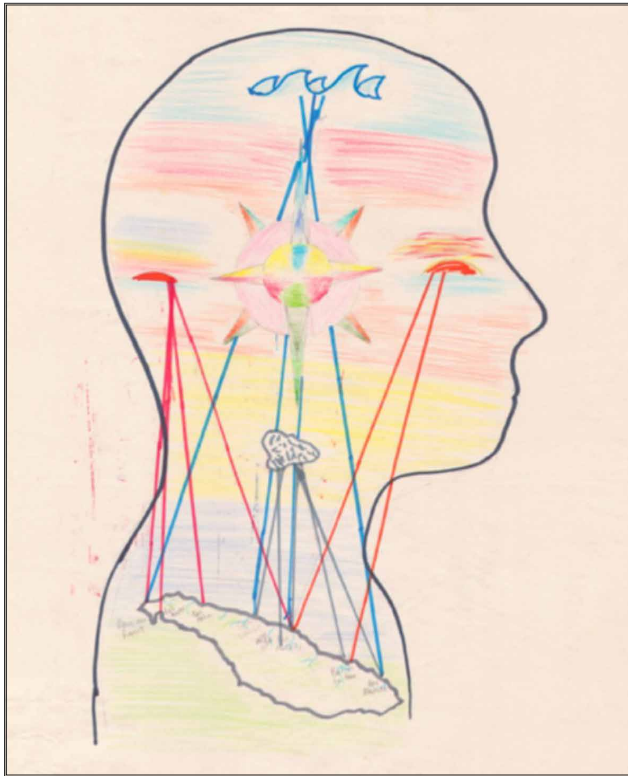


Courtney: Exhilaration and Reflection

I follow the directions of the compass rose at the side for the different ways I felt alive during our trip. South, I have peaceful and then north is frightening. I don't think frightening is really the word I am looking for, but somewhere along those lines, then east and west are landscapes and living. Then I took all my field notes about the moments where I felt most alive and then put them where they made me feel. So, for landscape and frightening, I have the lightning that hit close to the boats, and then peaceful I have the northern lights, and then here is all of us swimming in the ocean in the middle, and then the seals, and then here is the deer, and then we have the bioluminescent plankton, family dinner, explorations. I think this map is asking me: *Are exhilarating moments better or worse than reflective ones?*

* * *

I realized I need both. Exhilarating moments are like the ones I want to have more of. But then, it's also important to take some time to myself to just calm down, especially for mental and physical health and well-being to take those reflective moments. I think they can maybe help appreciate the exhilarating ones a bit more too, so they don't just all pass by. I need both…. Exhilarating moments are more fun, but the reflective ones are important for keeping balance.



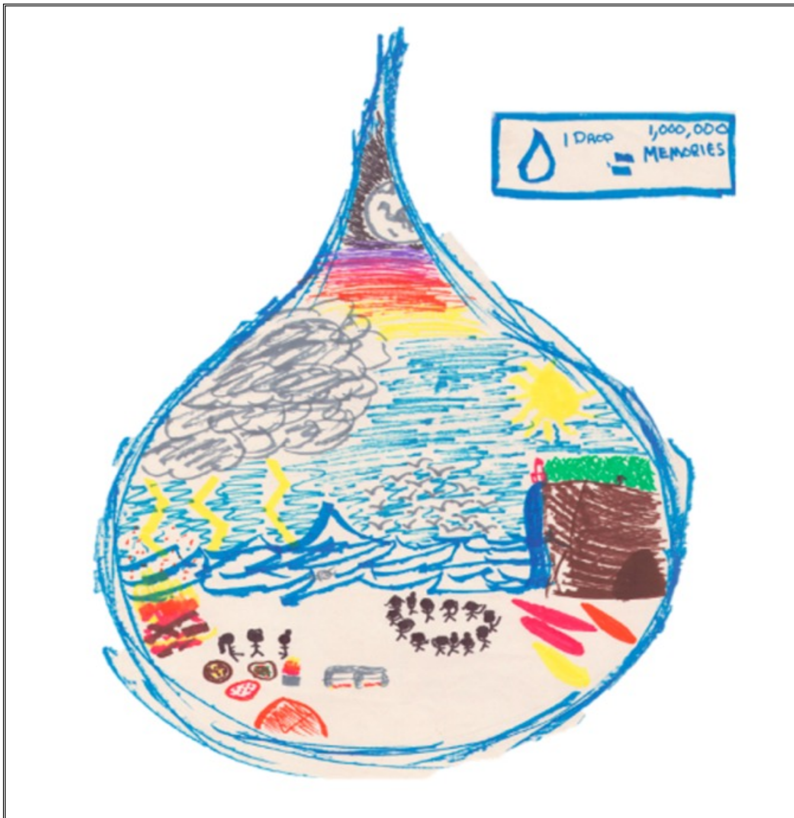
Nick: Connecting Head and Heart

I have a compass rose here, in the middle, pointing to the north. I always thought at any given moment, if we looked north, we would see the water, so I had that representing the water, south representing the land. Then I had east as the sunrise and west as the sunset and, down here, I drew the outline of the island. I tried to place it where my heart would be, then connected different points where I felt alive to different locations. So, moments when we were looking at cliffs, and I felt like they were protecting me at camp, I would draw to certain locations on the map. One of my field notes was about "the wave," and I drew a line from where that happened to the water direction. Kind of directing the moments to my compass.... If I was going to add to it, I would add more moments and keep connecting them to different parts of the island. The question I am taking home: *If I was the land, would I want me to live here, based on how I treat it?*

* * *

Where I am and the people that I am around, I see a lot of almost, hmm, ignorance. I mean, I don't want to accuse people of being ignorant, but I think

there's just a lack of respect and awareness. I guess others just haven't learned about the connections yet. I am thinking like, if I was the land, I guess, and no one even acknowledged me, it is like – it is just – again, it is not anyone's fault, I wouldn't want people to live here if I was the land. I think learning has to do with the experiences. We were lucky to have that experience on the trip we went on. We have kind of been exposed to experiencing it and living on it and relying on it, kind of thing. So, I think that's important when you're talking about how you can understand the land that you acknowledge the land. If I were the land, I would want people to live on me, but not the way that they are currently living. It is not that the land doesn't want us here, it's that it doesn't want us here the way that we are. There is no getting rid of us, but there's a more sustainable way to be here. That's something I think about a lot.



Emma: A Drop of Water

If our trip is a body of water, each memory is a drop in it. So, here is my drop! At the top is the scale: one drop is equal to a million different memories. It is titled "the sauce" because I would say that each moment where I felt that I was

> fully immersed in trip was when I felt "Lost in the sauce." Many of the moments had to do with visual things that were happening, so like when the gulls flew up over the water or the embers from the bonfire. If someone threw something one the fire, then the embers would just shoot up in the air. I was mesmerized by that. I have all of us jumping around while [Audrey] did her loon call. I have the caves and the cliffs. I have the sunrise or sunset depending on how you look at it. Then the moon and all the stars, especially on the night when we had to get up for water at 2:00 am because of the tide. It was incredible to see the stars that night. I have never seen more stars in my life. There were lots of times and moments where I felt absolutely grounded and centered in where I was. My question: *How can I continue to make meaning of different things that happen in my daily life?*

* * *

> Gratitude and humility are very important. Remembering how lucky I am for the opportunities I have. I guess before [the trip] these were concepts that related moretowards material things. So definitely, [the trip] got me thinking about the land and all the little things that are in connection. All the millions of little moments. It's about thinking about the rain drop. But now that I'm at university, I feel like my humility and my gratitude relates less to the land, which makes me sad, but it still translates into my day to day. I'll have moments where I'm walking back to my residence and I stop and think, 'Wow, I'm so lucky to be here right now. And I'm so lucky to be able to think about everything that I'm able to think about.' Those moments, they—I have them often, which is kind of special—nothing particular brings them on. It will usually be when I'm by myself and I'm able to stop and think of how much I get to experience every day. To make the most meaning of anything, we must make a choice to recognize it as something that's happening in the moment, or we must know when it's happening, and we must be aware that it's happening to us, and that it matters. My personal process is learning to recognize that whatever is happening is something that I want to remember or that I want to be significant.

Mapping (and Unmapping) for Relationship Renewal

The process of mapping throughout the Anticosti experience offered insight to better understand how connections surface for students, along with considerations for how relatives might be better honoured in outdoor practices. In the maps shared above, it is evident that inviting students into a process of noticing helped them attend to their participation within the natural world. Providing a frame through prompts helped students direct their focus while still being open enough that they could interpret their encounters individually. Students said that the task supported acknowledging connections that could otherwise be easily missed.

While mapping was generative in terms of supporting students to be in the moment and to position themselves in relationships, there were also processes of *unmapping* that occurred. By unmapping, I mean the process of undoing habits of thinking and doing that perpetuate the separations in the first place. I saw how dwelling differently – paying closer attention to rhythms of connection and taking time to consider our human position in the patterns – conjured awareness of tradition and involved revising deeply held ways of knowing and doing. For example, Emma spoke to her shift in gratitude from material consumption to the invisible or felt responses that surfaced during the day, and Fiona disclosed the importance of asking 'why' to expose her assumptions and to make do with what she has.

It is important to distinguish between mapping and unmapping to articulate the significance of what we were doing. Without this critical aspect (the unmapping), I fear that mapping might merely be seen as a neat art project or reflection exercise, instead of a rich perceptual practice that encourages transformed ways of being and relating. In this study, the students were involved in both mapping and unmapping, however the processes occurred in different ways and at various intensities among the participants. For example, Emma's drop of water demonstrated an integrated way of knowing as an approach that pulled layered relations together and then mirrored them back to her. This presented a richer level of connection compared to Fiona's map, which listed events that were meaningful to her. This is to say that the depth of relationships was not the same for every student in the group. As I make meaning of the student-generated maps and the students' interpretations of their encounters, I garner new understandings for renewing more ethical (kinship oriented) relations in outdoor learning practices. Based on my understanding of these maps, I suggest practices should work to: recognize cycles; generate knowledge through tracking clues; encourage an ecology of emotion; and meet unfamiliar responses.

Recognize Cycles

Inquiring about kinship as a concept, Tyson Yunkaporta (2020) writes: "kinship moves in cycles, the land moves in seasonal cycles, the sky moves in stellar cycles, and time is so bound up in those things that it is not even a separate concept from space" (p. 39). I am drawn to the scale and interconnectedness between various kinship cycles within the maps. I see patterns of sunrise and sunset, movement of tides, knowledge of directional winds, upward movement of fire embers, connection to the sun and the waxing moon. Likewise, an array of other beings (such as bird flight overhead and colonies of seals nearby) are present. I also notice that the human community of our group circled around natural cycles and instinctive needs to feed and hydrate ourselves, and to seek shelter from the elements. Comfort was shaped by simple tasks such as group meals, setting up camp, building fire, and collecting drinking water. As our human connections deepened, it seems that students were better able to trust

the process and form meaningful connections with the other beings. All cycles are connected, yet I notice that the maps focus on larger ecological happenings, instead of the smaller or hidden relationships. During our trip, we covered a large distance and encountered new features at every turn, meaning that there was a lot for students to capture in their mapping process. I suspect that if we had spent more time in fewer places, additional details and depth would be exposed in their maps.

Generate Knowledge Through Tracking Clues

Mapping encourages tracing interactions of patterns and rhythms to know how elements interact. Being thrown into a new maritime setting demanded hyper perception to swiftly decipher what was needed for survival. Our activities came already entrenched in the ecological network because we could not separate ourselves by going indoors during our journey; we had to endure whatever we encountered. Other than the prior experience of the other instructor and I (as educators who had been to the island and led this program previously), we did not have someone with local knowledge guiding us. We had to attend to cues from place and interpret what they were communicating.

At times, being wisely aware came through making mistakes. Nick's reference to "the wave" signifies a standing upsurge that caused him to capsize. This misjudgment led to more careful attention toward the movement of the water and how we were moving within the flux.

In retrospect, after this event occurred, we could trace cues that were unavailable to us beforehand because we did not know we had to question certain circumstances, meaning that tracking helped us build a language to understand ecological interactions.

Encourage an Ecology of Emotions

The experience became fuller as students gave heed to feelings, sensations, thoughts, movements, and connections. Courtney showed how movements bring forth assorted responses – in her case, through contrasting exhilaration and reflection. In this way, I better understand kinship relationality not as a utopian destination that one arrives at, but as something that may surface when the ecology of human emotion is linked to the ebbs and flows of experience within the greater whole of ecology.

In Courtney's example, there were times she felt frightened, and other times peaceful, and her illustrations of this spectrum point to connections with the diverse and dynamic moods of place. When she articulated her experience within this contrast, it showed me that both are needed for a balanced experience. One is not better or worse, but they can work together to generate something transformative. Exhilaration might awaken something new, but without adequate reflection on what the excitement might mean and how

the moment connects to everything else, deeper learning may be lost in the enthusiasm of the moment.

Meet Unfamiliar Responses

Nick's internal compass flowing in connection to the directions offers further learning about progressing along a line (or cycle) of growth. His description of connecting to the heart, while perhaps cliché, reminded me of common sayings such as *follow your heart, it knows the best path*. Through the task of deciphering what most needs attention, he was learning to trust himself. In that regard, I am drawn to Nick's expression of feeling "watched over" by the cliffs at camp. I wonder how the feeling was about encountering unfamiliar responses in himself. The more he attended to the unfamiliar, the more the unknown was able to speak to him, and perhaps this helped him understand his purpose. For example, as we came to know the shoreline, Nick's focus on connecting to the heart is interesting. His heart seemed to swell as more connections became visible and felt – as life around the island and our movement with it became more familiar. His question about what the land wants and needs strikes me as a movement from being a stranger (separate from place) to forming values of co-existence. His framing of land posing the question back to him suggests a deeper exchange with awareness toward the implications of our presence. More specifically, he was thoughtful towards entities alive in place and how they were experiencing strangeness by us being there. From him, I learned that flipping questions in our experiences might be a practice that can cultivate reciprocity within our encounters. Nick continued to puzzle on questions with increased concern after our trip. While he meets "ignorance" within his dominant circles, implying limitations of a worldview, he attributes the opportunity to learn more and understand his connections as openings to new possibilities for living more ethically.

Mapping Outward: Implications of this Work

Spending time with students during this study showed me that prolonged immersion and mapping of experiences can encourage healthier relationships, and even a renewal of kinship; however, the privilege of this study is not lost on me. The students were enthusiastic about spending time outdoors and had access to resources that enabled their participation. Not all young people want to spend time outdoors in this way or even know that it is a possibility. In addition, since the logics of placelessness are so deeply embedded in knowledges that stem from relationship denial, even educators who do not worship scientific-technocratic processes may find it difficult to connect meaningfully with place-based ecologies (D. Donald, personal communication). Likewise, not every educator has access to an Elder to seek guidance.

I am left wondering what all of this might mean for others. Since we are already embedded in systems of relationship, I hope my learning in this study will inspire others to look for simple openings or create routines that point out relational patterns to students and encourage them to see themselves as part of the ecological network. In many outdoor learning situations, these routines are already part of programs (for example, we attend to what the clouds, winds, or waves are communicating to plan activities) but I am focused on the shift that happens when we move beyond conducting these routines for the purpose of human-centric happenings. In doing so, it is important to remember that mapping is not a deductive process, and that it takes time, patience, and sometimes struggle, to bring students into the work meaningfully. This process-oriented approach might feel uncertain at first, but through practice, it became evident that it was the only way to support students to be who they are in the practice. I had to work through iterations of the task before I found one that worked well during the kayak trip. Prompts to help students recognize relations, devices to record experiences in the moment, reassurance that all parts of our human experience generate knowing (paying attention to emotion and connection), and encouraging students to ask questions of themselves and of their experiences, can all help students grow into who they are within a wider system, but to also respond to kin relatives with care.

In the background of mapping with the students, wisdom from Elder Cardinal inspired my disposition and approach. I was not, however, directly translating his teachings in what I shared with the students. I had to do the work of listening and understanding the wisdom for myself, to then share my story of widening kinship alliances in my context. This is constantly work in progress and my mapping process here is just one example of an activity that can encourage slowing down to recognize and honour the web of various lifeforms in which we exist. In my practice, I have tried to live the words of Donald (2019) who shares that in learning wisdom teachings, "nothing good grows from [them] unless people enact [the] teachings in their daily lives" (p. 119).

Conclusion

Maps come laden with historical and cultural values. In outdoor and environmental learning contexts, they are often used in scientific ways (navigational work) that separate humans from their innate ecological connectivites and inertly perpetuate colonial ideologies. In this study, I endeavoured to carry forward wisdom teachings to bring students into a more holistic process of mapping. In doing so, I found that there are tangible ways for students to be brought into dialogue with cycles, patterns, and rhythms of other lifeforms to uncover insights about who they are (to question their values and purpose) and to learn within kinship networks toward renewing and enhancing relationality. I hope that other educators will also increasingly question taken-for-granted

pedagogical practices and turn to approaches that can help students to slow down to observe, listen, feel, and connect in ways that help them recognize their participation in systems that give and sustain life.

Notes on Contributor

Jennifer MacDonald, Ph.D., grew up on the northeastern shores of Lake Ontario. She now lives and works within the prairie grasslands where she is an Assistant Professor in the Faculty of Education at the University of Regina. She teaches courses in outdoor, environmental, and treaty education, and her interdisciplinary research centers building language and meaning to enhance relationality, especially through outdoor learning experiences.

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Ecologizing *Bildung*: Educating for the eco-social-cultural challenges of the twenty-first century

Sean Blenkinsop, Simon Fraser University & Linda Wihelmsson, Mid Sweden University

Abstract

This paper has two main purposes. The first, more informational, is to introduce, re-introduce, the German-Nordic concept of Bildung *to Canadian environmental education. This includes a brief attempt to define, a short overview of its history which stretches back to the Eighteenth century at least, and then an exploration of why and whether* Bildung *might still have some relevance and value in a post-modern, post-humanist, world filled with social crises and myriad human injustices that need attending to. The second purpose, is more theoretically expansive and experimental, wherein we explore ways this modern humanist concept of* Bildung *might not only be updated as an educational response to today's human problems but might even be ecologized. Our reading shows that some of the former has already been considered but that there has been almost no work done on the latter. Finally, as a way to consider practice, we very briefly turn to Klafki's five* Bildung *inspired questions for didactical analysis in order to illuminate implications for environmental education. This allows possibilities to emerge in spite of the need for further development.*

Résumé

L'article a deux visées principales. La première est de présenter (pour une première ou une nouvelle fois) le concept germano-scandinave de Bildung *au milieu canadien de l'éducation à l'environnement. On y définit brièvement le concept tout en donnant un aperçu de son histoire (qui remonte au 18e siècle); on y explore également les raisons expliquant la pertinence et la valeur, toujours d'actualité, de la notion de* Bildung *dans un monde post-moderne et post-humaniste frappé de crises sociales et d'une myriade d'injustices auxquelles il faut porter attention. La seconde visée est à la fois une tentative de repousser les limites de la théorie et une application expérimentale de cette même théorie; le but est de trouver comment adapter le concept humaniste moderne de* Bildung *à la manière dont l'enseignement répond aux problèmes humains, afin de l'écologiser encore davantage. En lisant sur le sujet, on voit que des solutions ont été envisagées pour adapter le concept en éducation, mais qu'on a peu, voire pas du tout, tenté de l'écologiser. Enfin, une analyse didactique, à l'aide des cinq questions de Klafki (qui s'inspirent de la notion de* Bildung*), permettra de mettre en lumière les éventuelles ramifications du concept dans l'éducation à l'environnement, ainsi que sa mise en pratique globale. Cela permettra de laisser émerger les possibles et soulignera la nécessité de pousser la démarche plus loin.*

Key-words: Bildung, social justice, ecological justice, Gadamer, Klafki

Mots-clés : Bildung, justice sociale, justice écologique, Gadamer, Klafki

Part 1: Defining and historizing *Bildung*

Defining *Bildung* is an ambiguous (Bohlin, 2009) and elusive (Tahirsylaj & Werler, 2021) task. Part of the challenge is that the definition has changed over time and that *Bildung* is, oddly, both noun and verb, product and process. And because *Bildung* is in part shaped by the problem/s, cultural justice issue/s, to which it is responding, by the context within which it is working, and by the envisioned improved aimed for state of things that those same problems/injustices are impeding.

For example, the envisioned, enacted, even pedagogical *Bildung* offered by Von Humboldt, the first serious educational thinker to propose it in the late eighteenth century, focused on the emancipation of humans (read: males) from the imaginatively limited dominion of the church. Thus, Von Humboldt's response to this challenge was to seek a form of individual freedom that wasn't subsumed by the homogeneity of church dogma. And with this end in mind, this goal towards which education might aim, Von Humboldt then backfilled the how and what of education to reach it. Thus, an education filled with discussion, critical study, science, and the advancement of ideas and a moral frame of one's right to one's own opinions particularly if well considered and supported. And, a sense that one was both creating oneself but also offering a panoply of ways of being human so others might also consider escaping the ecclesiastical yolk. But also, an education where the content becomes a curriculum of big ideas, of reasoned scientific thinking, of seeking important role models (including Christ), and of working upon oneself in light of all this. As such, for Humboldt, *Bildung* is a process of becoming, of lifelong learning, of creating oneself in light of what is "scientifically" known. It is important here to note that scientific knowledge was not understood as objective, unassailable, 'solid' knowledge that could be fully achieved (SOU 1992:94).

Whereas by the time Gadamer was exploring, and defining, *Bildung*, in the mid-twentieth century, the challenge was no longer the restrictive presence of the church but the corruption of capital, the alienation of many people from themselves and others, and the injustices of a patriarchal and colonial world. Thus, the why of Gadamer's *Bildung* though still carrying an emancipatory, self-creative, culturally transformative vision has flexed to that contemporary context. And as such, the how and what that makes up Gadamer's *Bildung* involve encountering diverse horizons of being, expanding one's critical range and reckonings with varying others, and undoing some of the shacklings of the meta-narrative.

The point, although hard to define categorically given changing context and content, is that *Bildung* is about the creation of self, community, even culture in response to a set of challenges that appear, at any given historical time, to be restricting the mutually beneficial flourishing of the group and its members under consideration at said time. It is, at least in part, as Klafki writes, about the learner's ability to be aware of the historical dimension of todays societal problems, to recognize the problems for what they are, and to assess them into the future as far it could be predictable, but also about one's co-responsibility for them and for overcoming them. (Kvamme, 2021) As such, *Bildung* is both about the why, the aims, of education and the how and what of education in relation to that why. And it involves the creation of both the aimed for individuals and communities but also the deeper more interconnected relationship with the wider world that allows said vision to become and to prosper. It is about process, product, and conditions.

The literature relating to *Bildung* in environmental education is fairly sparse and hasn't really picked up on this justice oriented contextual community responsive thread we are seeking to develop here. Sauvé (2005) positions *Bildung* in the "current" which focuses on eco-education and on personal development in light of the fact that we live not only as personal actors in social environments but also in a larger natural ecology which, often quite subtely, shapes us as well. Drawing on Pineau's (2000) concept of eco-formation Sauvé sees *Bildung* as enacted by environmental educators, as necessarily, and perhaps more thoughtfully, including the more-than-human as a part of the project self-development in good ways. The work below extends this discussion while at the same bursting the banks of the proposed current through the addition of currents related to eco-justice and community change. After Sauvé things go quite silent on the *Bildung* front until it is briefly mentioned in the context of bringing together Wild Pedagogies and *friluftsliv* by Jorgensen-Vitterso *et al* in 2022.

And with that frame we return to the larger *Bildung* literature for further nuancing and, sadly, complexifying of the definition:

Bildung as an educational practice, tradition and set of aims focuses on the creation of and relationship between the individual and society and is in that sense fundamentally democratic in its orientation. By the mid-twentieth century German educational theorist Klafki was "operationalizing" the more theoretical, less pragmatic, definitions into an educational space that fostered self-determination, co-determination, and solidarity (Tahirsylaj & Werler, 2021; Klafki, 1995; Klafki, 2010). Historically, as interest grew in the democratization of society, the earlier enlightenment *Bildung,* focused on the "formation or cultivation, in education or otherwise, of human moral virtues and other capacities" (Bohlin, 2009), with a particular interest on "spiritual formation" (Ryen, 2020, 215) began to change. This early form of *Bildung* had a marked focus on the emancipation of the individual from centralized control. It included

having individuals become the creators and authorities of/on themselves and tended to run into trouble when it veered into self-centeredness. The move by *Bildung* theorists in search of a greater democratization of society expanded its purview beyond just the individual and worked to protect against the potential for self-centeredness (Blanketz, 1985; Klafki, 2010). Varkoy describes this as the distinction between adaptation, where one just accepts the boundaries of one's situation/context/culture vs acculturation where one recognizes the presence of a cultural framing, its accompanying propaganda, and has the wherewithal to critique and even to change it, or at least change oneself in light of it. (Varkoy, 2010) Thus giving one the opportunity to be something different in the world. In some of the reading one gets the sense that 'education' tends to be seen by the advocates of *Bildung* as being so stuck on the how and what of the process and that this often leads to learners who are adapters rather than including the why, to what ends, as the driver of the how and what and thereby offering the possibility of individual freedom and cultural critique, Varkoy's acculturation.

Further to this, proponents of *Bildung* are critical of traditional education for sliding into a why that focuses on preparing and qualifying people for the labor market or a narrow form of content knowledge. (Bohlin, 2009) This in turn leads to an over-specialization, instrumentalization, and fragmentation of knowing (Nordenbo, 2002), and likely the learner themselves, and contributes to alienation from self, knowing, and the possibility for freedom (Gur-ze'ev, 2002). *Bildung* prioritizes a lifelong process where individuals are prepared to find, ethically and socially, and even create themselves, their places in the world, and the world itself (Biesta, 2008). As such, *Bildung* becomes more open, democratic, and philosophically inclined to ongoing conversations with regard to the purpose of education. Other theorists push these ideas further suggesting that the heart of *Bildung* is about interplay – the "linking of the self to the world" (Bohlin, 2009, 2) – and openness where "cultivation is here the dynamic between an object that insists on its independence and authority, and an individual who cancels his or her [sic] prejudices by suspending closure." (Lovlie, 2002, 475). This "double openness" to self and other is not solely about mastering a subject or the pedagogical and curricular processes of doing so but about recognizing the future as unknown and developing resilience (Herranen et al, 2021), attitude, and wherewithal to handle and respond to uncertainty, incompleteness, and change.

Not long after Von Humboldt and others began to formulate this idea of *Bildung* and the search for one's freedom and the good life (Herranen et al, 2021). These ideas began to be co-opted by the bourgeoisie and *Bildung* slid away from its more radical and transformative roots and into an elitist education that involved becoming part of the "high" culture through self-development and immersion in a life of privilege. Components of *Bildung* like the search for shared justice, self and cultural transformation, and the dynamism and discombobulation of life and change were shed in a search for the idea of harmony (Nordenbo, 2002).

But even during this period not all *Bildung* was lost for as the powerful were defining it in terms that appeared to return it to mere adaptation others were taking it up in a "counter" pedagogical fashion (Gur-ze'ev, 2002). This included the folk-*Bildung* movement of in Scandinavia (Andersen, no date; Burman & Sundgren, 2010) with its desire to expand educational opportunity, switch focus from a narrow band of cultural knowledge to include a much larger range of what might count (e.g. including agricultural, home-making, and craft knowledges). This form of *Bildung* was a return to some of Von Humboldt's roots but also added a desire to redefine 'citizen', emancipate not only individual minds but also bodies (Madsen & Aggerholm, 2020), and expand democracy. Intriguingly for education this move also included a shift away from teacher-centredness (Ryen, 2020) and opened space for more informal de-institutionalized learning opportunities. Away from teacher- as- expert and arbiter of knowledge to a more inclusive and dynamic epistemology. As such, *Bildung* was able to contribute to more democratic institutions and counteract unequal conditions in society at the same time as dealing with questions about how to motivate students to learn (Arfwedson, 1998). In this process students were not simply absorbing all the truths of their culture as determined by their educators and the elite but were asked to develop their own critical interests, and their capacities for critical questioning, and link these to their own lives. Educators were then asked to find ways to reflect these objectives in practice (Klafki, 2004).

At a similar time *Bildung* was being recreated by the critical theorists of the Frankfurt School. Here education was positioned as a change project, a necessary means – an activist orientation (Hu, 2015) even – in the fight to respond to meta-narratives and what might now be called the neo-liberal agenda. The sense was of *Bildung* as seeking critical, yet inclusive, aims and the idea of education for/as transformation appears most fully. *Bildung* is seen as an educational project that overcomes injustices, allows for difference in its many human forms (note: there is no ecological discussion at this point), and rather than aiming for harmony, prioritizes openness, and equity (Herranen et al, 2021), criticality, worthy suffering (Gur-ze'ev, 2002), and comfort with the messiness of it all. Disturbance is welcome and the desire for resolution – often framed as progress (Gur-ze'ev, 2002) – is viewed with suspicion. So, although *Bildung* as influencing of practice is often seen to be about lifelong learning and a moving away from instrumental thinking when developing skills and competencies. The discussion about educational purpose in *Bildung* now also includes being allowed educationally to encounter, enter into dialogue with, (oneself, others, and society so that one might take the space and the opportunities provided to find/create themselves while not impinging on the projects of those around Madsen & Aggerholm, 2020; Lovlie, 2002).

The engagement of the Frankfurt school with *Bildung* led to a bit of a renaissance and a significant change in its presence, at all the levels of why, how, and what in schools. Prior to being influenced by the Frankfurt school

Klafki developed, what he called his categorical *Bildung* theory which sought to offer didactical frames particularly around content that would help educators in the day-to-day work of teaching. By the 1970s, influenced by the critical social agenda of Gadamer, Adorno, and Horkheimer the categorical had become the critical-constructive. *Bildung* had moved from focusing primarily on process to include questions of ends, values, and changing the existing culture (Klafki, 2000). Klafki created 5 questions for didactical analysis which highlight the importance of reflection in teaching. Klafki's questions focus on the what, why, and who in relation to the content and how it can contribute to meaning-making for the students. Thereby bringing the process and goal components of *Bildung* more explicitly into the hands of practitioners. These five questions are still used in today's teacher education and for teachers in schools (Wahlström, 2019). We will return to them at the end and spend a bit of time starting the project of "ecologizing" (Blenkinsop and Kuchta, 2024) them.

By now the reader has a sense of *Bildung* as both process and product, noun and verb, means and ends, and a set of practices/pedagogies and curricular content that are created and delivered towards expressed aims. An end that is often about seeking ways to allow individuals to flourish while creating a context and culture where all can do so. Also, it can be seen that the ends change as the context out of which the *Bildung* is arising changes. This then means that the transformative activist spirit of *Bildung* stays present even when the particular to be overcome appears to change. Whether it be the hegemony of the church, the control of elites, the malfeasance of the capitalist economic system, or the injustice of the colonial/patriarchal structure *Bildung* is the educational project that takes these seriously, seeks to overcome them, and actively works to bring practice in line with these goals. As such, given the historical arc, it has been possible for the professed *Bildung* of one age to become either the problem of, or a quaint throwback for, the next. And yet, because it is not dogmatic or committed to any particular content, time or context it has been able to flex into transformative usefulness over the course of the last almost 300 years. The modern concept of *Bildung* is not subordinated to current political, religious or economic interests. Instead, it is capturing the present as unfinished and the importance to prepare for an open unknown future (Uljens, 2006). In this sense, *Bildung* and its willingness to examine questions of values, to critically engage with the day's political and practical inequities, and to create constructive frameworks for active practice means it can contribute to supporting the different goals and ideals of education that emerge in any particular teaching practice. This is important not only in examining goals of practice but also when it comes to questions of democracy and power (see eg. Eriksson, 2019). It is to that question of its flexibility that we turn our attention now for we are interested in whether or not there might be the possibility of a *Bildung* for our current context. A *Bildung* that might be ecologized and in turn help us respond to the eco-social cultural crises of the day and the troublesome educational hows and whats that appear to aide and abet their continuance.

Part 2: Updating *Bildung*

As has already been pointed out *Bildung* has changed quite dramatically over time. In fact, it might be thought of as a container concept into which current educators/educational theorists place the contextual cultural problems of the day that need overcoming together with both the envisioned aims and the proposed educational hows and whats for achieving those ends. *Bildung* is rather like the Dread Pirate Roberts in the tale The Princess Bride, the name persists for generations while the physical person inhabiting the character changes periodically. For the sake of brevity and because this argument likely doesn't need too much more we are going to focus on three key problems, given today's environmental challenges, that might need inclusion in that *Bildung* container mentioned above – anthropocentrism, self as individual, and species elitism with particular reference to those desirous of voice and flourishing. All currently appear to exist in the assumptions undergirding *Bildung,* even the most recent forms thereof. The hope is that in naming, removing, and replacing these we might begin to consider a *Bildung* for today and tomorrow. An *Eco-Bildung* perhaps. We should note that all three of these challenges have long been recognized as problems in environmental education and that change has not been quick nor easy.

Part 2 (A): Challenging anthropocentrism

Placing the human at the center of things was at the heart of Von Humboldt's early work. For him the anthropocentric thesis (Luth, 1998) was a necessary political move in order to counteract the oppression of the church which kept humans at the margins and placed God and a chosen few at the center. Now in Von Humboldt's context this move towards equity for all men, for it was indeed men, was a transformative and rebellious act in the face of God's power and yet today the anthropocentric thesis, even if it does include all genders, can be seen as problematic with regard to the environmental crisis. Myriad environmental thinkers (Plumwood, 2002; Weston, 2004) have named this placing of humans at the center and its accompanying assumptions of superiority and dominion over the rest of the planet to be one of the stickiest and most troublesome assumptions particularly if the goal is the continuance of human life and creating a world that is more ecologically and socially just.

Within the *Bildung* discussions it was Klafki who began to suggest that environmental challenges needed to be included as part of the 'problems faced' discussion and yet as Kvamme (2021) points out that response was unreservedly anthropocentric focusing primarily on humans as adequate problem solvers and the lone agential beings. It worries Kvamme, that in these early days of the Anthropocene Klafki's educational theory still positions humans "as a species entitled to a solely instrumental relationship with the

complex and manifold webs of life that constitute the biosphere of Earth." And he claims "that this imaginary is inadequate … because it maintains the very structure that conceals the interests of other species." (Kvamme, 2021, 6). And it is in this question of undoing this structural challenge that we think work can be done to ecologize *Bildung*.

In the last 30 years there has been quite a lot of discussion regarding the options that might exist beyond anthropocentrism. Some have suggested a move to ecocentrism and putting the Earth itself into the centre. Others, worrying about the hierarchy that tends to appear when any group is "centred" have offered a multicentric worldview that is more pluralistic and dynamic. Still others have suggested an ontological change where humans are lowered, or all other objects are raised, to a shared, equal but different, ontological status as objects. And more recently there have been attempts to rid ourselves of the center altogether and use imaginaries that recognize relationality and the processional nature of comings together. Here arisings, assemblages, situatedness, and rhizomes are all given metaphorical life in ways that seek to recognize the concerns of other species and, for some, honour their voices, rights, vitalities, and agencies.

So how might an environmental educator choose amongst this plethora of possibility or even make sense of what it might mean to educate rhizomatically or ecocentrically? We are not sure but that is part of the wonder of *Bildung* as an active and changing educational practice. It allows the educator to name the problems, in this case anthropocentrism in educational practice, and then try something out with learners, say positioning nature as having agency and rights. This could include something simple such as seeking to encounter the natural world in ways that are not just instrumental. Or, more complex like naming nature as an active and agential co-teacher (Blenkinsop & Beeman, 2010) that deserves the space and possibility to be part of the educative process in whatever way it might. All this is followed by reflection on what was done and what actually happened and then a rigorous reflective questioning to see if there was some success in de-centering the human and the implications thereof. Then, in good experiential ways, to reflect and rework not only the whats and hows of this experience but also to refine the aim itself. For as we try to teach in less anthropocentric ways we get more insight into what anthropocentrism is, how it manifests in teaching and learning, and things that appear to work in response. Critical constructive didactics foster the relationship between theory and practice and encourages there to be continuous work such that both can be developed and visualized in didactical models (Eriksson, 2019, Wilhelmsson & Damber, 2022).

Part 2 (B): Overcoming the limits of self as individual

An interesting and ongoing component of *Bildung* has had to do with the human self. Von Humboldt suggested this project of creating oneself, of placing that

creation into the world as both offering and possibility, and of experiencing the freedom to do this according to one's own desires and realities. There was a kind of becomingness, fluidity, and choice of the self postulated right from the get-go in *Bildung*. Over time the sense of what the self is has changed, been redefined (Klafki, 2010), and it has moved from a clearly individualistic – autonomous human – form to a more relation – immersed in/shaped and influenced by context and community – being that is dynamically engaged with the world around in its becomingness (Biesta, 2008). This process of change has then had an influence on *Bildung* as the educator is challenged to focus not just on each separate learner but also on the community of learners and on the histories and cultures each one brings with them to any learning experience. And yet, there is still a clear sense of an "I", as having a kind of independence often contained by the boundaries of skin, even in this more relational sense of self.

So, while we have moved away from the individualistic assumptions of early *Bildung* we wonder if that needs to go further with the undoing of the self as singular human. Beyond even that self that is acknowledged as interdependent, always and already in the world, and in myriad relations all the time. We postulate that the self being assumed in the current *Bildung* conversations is not yet an ontological shift to a self that includes these proximal others (such that they are not separate others so much as differing constellations within the boundaries of this more expansive self), the land (such that self is lesser than or even incomprehensible when encountered in its human component form separate from the rest), or one's ancestors (such that self includes those who have come before in a way that the detached merely present form is misunderstood or not fully encountered). This kind of self as shared space (in time, place, and expanse) might be described as ecological. And the kind of self that we see arising in work with trees (Simard, 2021) and lichen (Sheldrake, 2020). And, we think that postulating this geographically, historically, and communally situated self might open new possibilities for a more eco-socially inclusive and just culture. What happens if we acknowledge that we are all ecologically intertwined with the more-than-human in both body and mind? In educational contexts this would at the very least require a more present awareness of situatedness and all our relations. For as Klafki, in quoting Kant, suggests, "children must be brought up not in accordance with the present-day condition of the human race but rather with a future and possibly better one …" (Kant as cited Klafki, 1999) and maybe that better future is asking the humanistic self to step into a more ecological post-humanist form. This expands the question of what it means to be a self. For we are in the world together with others both human and more-than-human, and all these beings might want the same opportunities for selfhood.

For the environmental educator this move to working towards a more expansive self is a challenge indeed because the ripples of trying to consider oneself and one's learners in a different ontological mode are quite significant. Not only does this question what knowing is, where it is located, and how it might

be assessed but it also pushes back against some of the basic assumptions of modern Canadian education. For example, are we actually teaching towards an autonomous, independent self-sufficient and self-creating citizen in a modern democracy or something much more situated, relational, and inclusive in a post-human eco-democracy? And yet there are hints with regard to places to start. Immersing learners in the natural world with lots of time to explore and connect, recognizing where one's own educational assumptions are re-enforcing particularly restrictive notions of the self, and even finding ways to assess that are more focused on shared knowledge, what has been created together, and whether the work furthers the possibilities of all-our-relations and not just a singular human learner. An education for, with, and through the world around.

Part 2 (C): Expanding the who that 'deserves' to flourish

In some ways our suggestions for A & B above are really just extensions of good, rich, work that has already been done and that might be a good way to think about part C as well. *Bildung* has in fact changed overtime in terms of who is considered as an individual, as deserving of freedom, and as having the right to flourish. And this trajectory has in turn influenced *Bildung* both as practice, for the hows and whats of education must change if you are not simply focused on the kinds of individual freedoms that work for just privileged white males. In terms of aims there has been an expansion of criticality with regards to the rights of all humans to create themselves and this has wildly expanded the range of what it means to be human as individuals, communities, and cultures. Particularly as these groups come into contact, conversation, conflict, and communion with each other. The step we are proposing, which likely doesn't come as a shock, is to expand this commitment to freedom, to flourishing, to each being having the room to become in its best possible form without getting in the way of others, to the more-than-human world as well. Our sense is that just like previous moves the possibilities that arise in terms of what it means to be human, even if the space is seeking to include willows, newts, and ermines, and how that is made manifest are expanded enormously.

We have two quick ways that we think environmental educators might begin to consider this move to expand flourishing as a right beyond humans. The first goes into *Bildung's* commitment to the political, to recognize that education has a political dimension to it no matter the choices being made and that there is a politics to committing to aims of eco-social cultural change (Blenkinsop & Fettes, 2021) and/or mutually beneficial flourishing (Blenkinsop & Morse, 2017). Historically this idea of freedom and creating the self has been tied to social responsibility and a sense of also creating community where the self can actually be created and heard. For many theorists this has mapped directly onto a conversation about democracy, creating the kind of political environment where all voices are heard and honoured, no matter how small or unusual.

And educators have been asked to think about this in terms of their learning spaces. We wonder then whether this might be a leverage spot from which to think about the possibility of an eco-democracy. Creating spaces where more voices than just humans are heard and where that range of needs might be considered as decisions are made. One example of this from the bio-regionalist movement of the late twentieth century would be the Council for All Beings (an ostensibly democratic gathering that seeks to bring in diverse voices across nature's spectrum). The second consideration we offer here is to ask teachers to consider what might happen to their teaching practice if they recognize nature as colonized (Blenkinsop *et al*, 2017). Thus, in parallel to reconsidering practice through critical race or anti-patriarchal or reconciliatory or inclusive lenses educators could develop a reflective awareness and responsiveness to how their language, their activities, and their interactions with learners and place might be furthering a troublesome colonial orientation towards all those kin of the other-than-human kind.

For the environmental educator questions that might appear in their planning and teaching include: What does dialogue that includes the more-than-human look like? How can different perspectives be included? What does it mean to listen to the more-than-human, to actually hear those voices (what they are saying, understand their meaning, recognize their perspectives) without making assumptions that further the colonization? And, once heard, what changes or new relations are possible in this social, cultural learning context? What does it feel like to listen *for* their voice and focus on the opportunities for learning therein without falling into an extractive position that assumes knowledge is there for the taking and that the form that knowledge takes doesn't matter even if it instrumentalizes or backgrounds the natural world as teacher? What does mutual flourishing look like and what is mutual when thinking of moss, raven, or caterpillar? What kinds of activities allow for shared learning/knowing to appear and be recognized? And how do I respond to knowledge and self-structures that appear to act in the opposite direction of an eco-democracy and potentially further the colonization? Finally, given this how can we hold difference, as a necessary part of a thriving democracy and avoid the desire to force agreement?

Part 3: By Way of a Conclusion: Educating for, with, and through Eco-*Bildung*

Educating *for, with*, *and through* Eco-*Bildung* is, the reader will notice, a play on the idea of educating for, with, and through nature and in many ways these ideas are overlapping. But what does eco-*Bildung* look like in practice? How might an interested environmental educator engage with ideas and aims of eco-*Bildung*? For some, these offerings might be brand new but for many there are likely some familiar themes appearing in the above discussion.

In this admittedly short final concluding section we will try and draw in the *for* (the focus on the "why" -- the aims of an eco-*bildung* -- in this essay named as mutually beneficial flourishing), the *with* (focus on the "what" of the curricular content in light of the "why"), and the *through* (focus on the "how" of a pedagogy that aligns itself to the "why" rather than undermining it as it so often does even when the best content has been chosen). To do this we return to Klafki and offer an *eco-bildung* re-reading of his well-known five questions for teachers/educators to align content to aims. The questions are introduced and then modified through a lens that seeks to honour our three critiques from above. For first-timers it should be noted that the five questions are mutually interdependent, they are not necessarily answered in order and the answers to each question are only understandable in the light of the other four answers (Klafki, 1995). The questions are:

a) What wider or general sense or reality do these contents exemplify and open up to the learner? What basic phenomenon or fundamental principle, what law, criterion, problem, method, technique, or attitude can be grasped by dealing with these contents as 'examples'?

As can be seen this question is very much directed towards bringing the particular and the general into conversation with each other. Thus, for environmental educators the question is always about how does this particular activity, encounter, lesson arise out of and potentially offer insights into the larger aims and problems to be addressed. Both of the "subject" but also of the larger cultural problem, aim, in focus.

Intriguingly, in our first ecologizing Klafki move there is not much to change in the question at all. By selecting the aim, say responding to alienation and a desire to be less anthropocentric the educator frames the range of potential curricular and pedagogical responses that might be available to them. Taking such a process seriously in terms of seeking to co-plan, leaving space for learners to encounter the more-than-human, and actively positioning the natural world as equal in an educational sense the role and acts of the human teacher must necessarily change in a more ecological direction. The most important difference might be the openness for change in the practice itself which is a precondition because of nature's unpredictability. This also asks the human teacher to release some of their control as expert/evaluator and sole creator of content and experiences. A second change is that teachers, students and the more-than-human become equal actors on the stage of learning and knowing which in turn allows the aims of education to be reconsidered, thickening the ideas of *eco-bildung*.

b) What significance does the content in question or the experience, knowledge, ability, or skill to be acquired through this topic already possess in the minds of the children in my class? What significance should it have from a pedagogical point of view?

Here Klafki is reaching towards a more progressive educational position that both considers the child as knower and having experience concerning the topic at hand but also that content must be relevant to the learner in their immediate context.

We have two recommendations regarding ecologizing this question. The first is to consider carefully how to include the student but also the natural world. And while this idea may sound initially odd, we have found that in considering almost any topic there are clear connections to, and positions to be found across, the more-than-human world. The second recommendation we have here is to notice the language of significance. It is pretty clear in the literature that interprets Klafki that this tends to be interpreted in relation to significance for the human (learner, teacher, community) and we would suggest expanding the considerations here to include the natural world. Expanding the consideration of significance can have quite dramatic effects on the curricular decisions being made while at the same time undercutting anthropocentrism and human elitism. This consideration coupled with the more expansive sense of self – with its intertwined ecological body and mind – can be wonderful fodder for a more radical practice.

c) What constitutes the topic's significance for the children's future?

Here Klafki is expressly asking educators to think through how they are preparing students for the future and since the beginning of *Bildung* there has been an express critique of educational projects that are simply trying to recapitulate and further the *status quo*.

Our eco additions are actually quite significant here as it appears that public education in Canada, although filled with preparatory language relating to future citizenship, is not really readying students either for the rapidly changing and uncertain world we are moving into or for a more expansive sense of citizen that not only genuinely includes all of humanity but also is leaving space for the myriad denizens of the more-than-human world to be considered and, even better, to have a voice. Here we see environmental educators finding ways to take a lead in both role-modelling a nascent eco-democracy in their educational spaces and in offering the skills that might be useful as we enter the Anthropocene. That is comfort with change and uncertainty, building community/alliances, building deeper relationships with the more-than-human, and comfort in doing the hard work of change towards undoing explicit, implicit, assumed, and institutional injustices.

d) How is the content structured? {which has been placed in a specifically, pedagogical perspective by questions I, II, and III)?

This is Klafki at his most practical as he asks the teacher to consider the order and organization of the content, the what and through, itself. Particularly considering the aims being posited.

Here the eco-additions head in two directions. The first involves the active inclusion of the pedagogy, the how, by naming it as important – How is the pedagogy aligning with the content and the aims? This is important because our research experience suggests that often the best intentions, even of environmental education, of say building relations or undercutting anthropocentrism can be undermined by the pedagogy employed by the educator. Imagine the educator walking through the forest and naming every plant and then telling the learners the uses for each in turn as a kind of mobile lecture. In spite of themselves the teacher is re-enforcing themselves as the centre of knowing, reifying a particular utilitarian orientation to nature, and centralizing a particular scientistic way of knowing. The second direction for consideration here is the question of who is doing the "structuring" and then what are the implicit assumptions of that structure. If part of the work of *eco-bildung* is about allowing myriad perspectives and ways of being into the mix to better support and challenge the learners in their self-creation and about including nature as a co-teacher then narrowing both the epistemological and ontological frames too much is troublesome.

e) What is the body of knowledge which must be retained ('minimum knowledge') if the content determined by these questions is to be considered 'acquired', as a 'vital', 'working' human possession?

Here Klafki is partially interested in the idea of the "central" ideas, or "core curriculum" but also underneath this question is the challenge of assessment. How do we know as educators what the learner knows? What is landing and staying?

In our research into eco-schools over the years the question of assessment has long been an incredible challenge. What are the implications of individualistic, competitive, hierarchical, and focused on particular kinds of knowing for testing and assessing? How might these be changed to become more inclusive, relational, cooperative, and in support of a more eco-socially justice culture where there is space for mutually beneficial flourishing? The trouble is we don't have a clear answer. At the very least we think it is important to reconsider assessment in light of these ideas. To potentially add in other ways of knowing that gives the educator a sense of how the learner is becoming and behaving in community. To consider including nature as co-evaluator, as having a stake in what and how human learners know, and maybe even to look for those educational spaces that allow for students to enact themselves in more fullness. But also, to acknowledge that sometimes the educator actually doesn't know what has been learned and to be ok with that.

And with that we have definitely reached the end of our space for this paper. There is much more to explore in relation to eco-*Bildung,* eco-democracy, and the implications of all this for environmental education. But at this point we think that drawing out and building upon the cultural change and justice

traditions of *Bildung* offers a potential entrée to developing rich pedagogy for our current times. And by aligning this work with an explicit naming of 3 key environmentally problematic assumptions of modernist education our goal has been to make the educational work or interpreting this theorizing more explicit. Our hope is that all this has opened some interesting conversations for human environmental educators to take forward in rich ways in spite of our inability to have complete and easily adoptable answers. But maybe that is the eco-point.

Notes on Contributors

Sean Blenkinsop is a professor in the faculty of education at Simon Fraser University. His most recent book, published by Cornell, is *Ecologizing Education: Nature-Centred Teaching for Cultural Change*.

Linda Wilhelmsson is a Senior Lecturer in Education in the Department of Education Mid-Sweden University. Linda works in teacher education and her main research interests are (Eco) democracy in educational settings, Bildung, student influence in teaching practice, and questions collected under the idea of Wild Pedagogies. She is leading a practice-based research project with small schools in rural areas. Linda is the research leader for Critical Perspectives in Educational Research (KUF) and is also a member of the Eco-Research Group at Simon Fraser University in BC, Canada.

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Regenerative Capacities: Bringing social studies and Indigenous studies together for education that responds to climate crisis

Heather E. McGregor, Sara Karn & Micah Flavin, Queen's University, Canada

Abstract
This article summarizes the results of interviews concerning intersections found among social studies and history education, climate education, and Indigenous studies. We explore what may be involved in curricular and pedagogical reform that better features these intersections, and what considerations arise in approaching reform in schools, universities, teacher education, and decolonizing pedagogies. Following a literature review and explanation of our interview methods, we summarize current barriers and strengths in social studies and history practices, and their capacity to address critical issues related to climate crisis as well as decolonizing schools and universities. We conclude with suggestions for the future of teaching, teacher training, and educational research and how these may contribute to regenerative capacities that better honour the relationships between human and more-than-human beings, while remaining attentive to Indigenous imperatives.

Résumé
L'article résume les résultats d'entrevues portant sur les points d'intersection entre les domaines des études sociales et de l'enseignement de l'histoire, de la sensibilisation aux changements climatiques et des études autochtones. Nous explorons ce qui peut être impliqué dans la réforme des programmes et de la pédagogie pour mettre en valeur ces intersections, ainsi que les considérations qui surgissent dans le cadre de la refonte des programmes scolaires et pédagogiques. L'article aborde aussi les implications d'une telle réforme sur les écoles, les universités, la formation des enseignants et les approches pédagogiques décolonisatrices. Après une revue de littérature et un survol méthodologique, nous résumons les obstacles et les forces actuels dans les pratiques des études sociales et de l'histoire, de même que la capacité de ces domaines à aborder les enjeux critiques liés à la crise climatique ainsi qu'à la décolonisation des écoles et des universités. L'article se conclut par des suggestions pour l'avenir de l'enseignement, de la formation des enseignants et de la recherche en éducation, et sur un portrait de la contribution potentielle de chacun au maintien des capacités régénératrices qui honorent mieux les relations entre le monde humain et extra-humain, un processus qui exige notamment de demeurer attentif aux préoccupations des Autochtones.

Key-words: decolonizing, social studies, history education, climate crisis, Indigenous studies

Mots-clés : points d'intersection, réforme, décolonisation, études sociales, enseignement de l'histoire, crise climatique, études autochtones

Introduction

Schooling that anticipates and responds holistically to climate crisis requires, and can benefit from, the contributions of all subject areas. Our hope is to encourgage and work with teachers in social studies and history specifically, alongside interdisciplinary teachers at all levels, so they may see themselves as climate and environmental educators working against anthropocentrism.[1] Further, our goal is to reimagine social studies and history education (SSHE) to take this change seriously and centre the learning necessary to respond to local, regional, and international manifestations of climate crisis, while resisting and working against settler colonialism. In this article, we expand upon previous work that asked questions, and suggested some new directions that this orientation could take in the SSHE subject area (McGregor et al., 2021). We argue that the task is much larger than adding environmental topics to existing social studies curriculum, or teaching the history of climate more frequently. Our understanding of the need for curricular and pedagogical reform involves teaching in ways, and about things, that will support youth living well—as individuals and in communities—even while in relation to deep uncertainties associated with climate, and intersecting crises. This new SSHE may include learning how to affect policy change over time, the effectiveness of species protection measures based on historical examples, how Indigenous ontologies and cosmologies centre the more-than-human differently from Western worldviews, and/or how to manage emotions when feeling threatened or disheartened by climate loss. As one of our interview participants shared, the debilitating emotions associated with confronting this "wicked problem" (Scranton, 2015) is one of its most difficult features (Hickman, 2020), but also provides an impetus and vehicle for change:

> I have really tough days too, and days of despair, a lot of grief, and a lot of emotion. But also, you know what, there are these unbelievable regenerative capacities. So how do we center those so that we can be much more intentional and conscious and say, even in these scarred places, *what is possible*? (Interview participant)

Here we share our search for common goals, sources of knowledge and experience, resources, and learning opportunities that exemplify "regenerative capacities" in—and as a result of— social studies and history education.

We are settler scholars and graduate students affiliated with Queen's University, located on Anishinaabe, Haudenosaunee, and Huron-Wendat territory in Canada, or what is colonially referred to as Kingston, Ontario. The university is located on the edge of Lake Ontario, just south of the Canadian Shield region, at the confluence of the Cataraqui and St. Lawrence rivers and close to the US

border. We participate in this settler colonial institution that sits on land that was supposedly "purchased" from the nations whose relationships to place[2] and land were preeminent. That purchase, by the Crown from the Mississauga peoples in 1783, is not well documented, surely involved coercion, was based on significant ambiguity surrounding the amount of territory in question, and was followed by forcible displacement and exclusion of Indigenous peoples from these lands (Murray, 2018). We recognize that we have inherited intergenerational fiscal wealth, social capital, and white privilege from our settler ancestors who participated in similar displacements at the expense of Indigenous nations close by, and elsewhere. We are committed to learning about, and from, specific Indigenous knowledges, and ways of being through decolonizing practices called for by Indigenous communities, situated in the ancestral territories to which we relate.

As scholars and settlers relatively new to the field of research in environmental and sustainability education, we are interested in learning from and in relation to others, as our own theories, pedagogical approaches, and purposes emerge. Thus, we frame this research as a preliminary consultative effort. In 2022, Heather conducted 13 interviews with researchers and teacher educators about how to reimagine SSHE in relation to climate response, and what that might look like, feel like, and accomplish, in terms of learning outcomes. The scope and implications of the interview findings extend well beyond this manuscript, but we intentionally begin here with a specific focus on the current and potential role of Indigenous knowledges and ethical relationality (Donald, 2009) in SSHE for climate crisis readiness, action, and wellness. We believe that a defining feature of a reimagined SSHE is its openness, flexibility, and attention to Indigenous knowledges, relationships, and what Tuck et al. (2014) call land education[3]—which is why we have begun by sharing findings with this focus. We seek to identify: what goals these fields hold in common; what curricular reform that better features these intersections might look like; and, what considerations are raised for schools, teacher education, universities, and decolonizing pedagogies, broadly speaking. Following a literature review and explanation of our interview methods, the article proceeds by summarizing current barriers and strengths in SSHE practice in schools and universities. We conclude with suggestions for the future of teaching, teacher training, and educational research.

Conceptualizing Education that Responds to Climate Crisis

Recent literature features urgent calls for the reorientation of education towards environmental and sustainability education, climate justice, and climate crisis responsiveness (Andreotti, 2021; Assadourian & Mastny, 2017; Farrell et al., 2022; Karrow & DiGiuseppe, 2020; Nxumalo, 2017; Wallace et al., 2022). Climate crisis-responsive curriculum will necessarily entail a variety of approaches and insights, but here we focus on the intersection of SSHE with Indigenous studies and pedagogies. Echoing Indigenous and ally scholars who have worked in

environmental education well before us, educational reform should begin with and return to centring Indigenous histories, land-based knowledges, and futurities (Aikenhead & Michel, 2011; Cajete & Santa Clara Pueblo, 2010; Kulnieks et al., 2013; Simpson, 2002; Stein et al., 2022; Tuck et al., 2014; Tuck & Yang, 2012). Relevant policy justifications for this focus include Article 15 1. of the United Nations Declaration on the Rights of Indigenous Peoples (2007), which states: "Indigenous peoples have the right to the dignity and diversity of their cultures, traditions, histories and aspirations which shall be appropriately reflected in education and public information" (p. 14). As most teachers are well aware, Canadian jurisdictions are actively responding to the *Truth and Reconciliation Commission of Canada: Calls to Action* (2015) for "age-appropriate curriculum on residential schools, Treaties, and Aboriginal people's historical and contemporary contributions to Canada" (p. 289), often placing those new expectations in social studies and history curricula. In 2022, the Association of Canadian Deans of Education (ACDE) (2022) released an accord on Education for a Sustainable Future, in which they assert, "An Indigenous wholistic learning model for environmental pedagogy addressing spiritual, emotional, physical and intellectual development will ensure the paradigm shift necessary in education for a sustainable future" (p. 7). ACDE advocates for the centring of Indigenous knowledge systems and Indigenous pedagogies as sustainable environmental responses to climate crisis, and the pressing need for a deeper paradigm shift in education.

Beyond the policy-driven rationale for this focus, we acknowledge that human-caused and/or exacerbated environmental changes are interlocked with capitalism-extractivism; an adherence to Eurocentric rationality, which dichotomizes human from non-human; and settler colonialism—referred to by Stein et al. (2017) as "the house of modernity" (see also: Kerr & Amsler, 2022). Examined historically, white settlers in the Global North hold the greatest proportion of responsibility for these problems, while racialized and Indigenous communities around the world bear the worst consequences. We believe the future of our species must be a collective and just effort that honours individual and collective rights, responsibilities, and interdependencies. Addressing climate crisis without perpetuating injustice must concurrently dismantle the oppressive power structures of settler colonialism. There is an important material dimension to this, but our educational project is one of changing hearts, minds, and spirits, as we seek to promote care for life. It is essential to expose extractive ways of thinking, being, and doing that have led us, and the planet, to the present state; the same attitudes and practices cannot be trusted to lead us out of it. Instead, we need local solutions and practices that uphold greater ecological relations. These are often, if not always, a matter of knowledge held by Indigenous communities.

Therefore, as we consider increasing the emphasis on environmental relationality in social studies and history, we must work alongside reconciliation, decolonization, and Indigenization efforts—while continuing to critically examine the invitations and outcomes of those same efforts. We are cognizant that

scholars who study institutionally-located Indigenous education acknowledge that despite forward strides in policy, further design and implementation of reconciliation, Indigenization, and decolonizing initiatives would benefit from better critical analysis, theorization, and a willingness to engage in unlearning, as well as deeper system change (Ahenakew, 2017; Donald, 2019; Gaudry & Lorenz, 2018; Madden, 2019; Marker, 2011). For example, Erickson (2020) argues that conceptualizations of both the problem of climate change, and potential solutions, must be assessed to ensure recommendations are not simply re-inscriptions of capitalism and colonialism, and recommends questioning colonial forms of environmentalism by way of centring Indigenous experiences. Gram-Hanssen et al. (2022) likewise draw attention to the relationship between climate change and colonialism particularly given colonialism's link to capitalism, and postulate that engaging with all three, especially for "non-BIPOC people," is an issue of what they call "right relations" or active efforts to change uneven power relations, respectfully (p. 678). Pratt and Danyluk (2019) contend that reconciliation cannot be arrived at by changing curriculum, additional resources, or a one-time talk from an Elder. Madden (2019) uses the language of de/colonizing to underscore that decolonizing may involve both colonizing and decolonizing components, despite efforts to resist the seepage of colonial logics into these same efforts. Although we cannot write more here about how actions under the banner of reconciliation or decolonization are understood in the context of education, this provides some of the contours framing these debates, to serve as touchstones for further examination.

The work of bringing these mandates to realization demands fundamental shifts, not just changes to curriculum, lesson plans, and assignments. We are inspired by the regenerative capacities of Potawatomi scholar Kyle Powys Whyte's (2017) work, wherein he suggests:

> Indigenous climate change studies perform futurities that Indigenous persons can build on in generations to come. That is, our actions today are cyclical performances; they are guided by our reflection on our ancestors' perspectives *and* on our desire to be good ancestors ourselves to future generations. (p. 160, emphasis in original)

As will be illustrated below, we are looking for regenerative capacities that necessarily acknowledge the undervaluing of Indigenous epistemologies and ontologies by dominant settler educational approaches in Canada. At the same time, they must address the underrepresentation of climate change topics. In this effort we look to leverage the particular strengths of current processes and knowledge bases in social studies and history, as these subject areas are generally taught in schools, and extend those towards regenerative capacities in ways that address contemporary precarities. This will involve both continuity *and* change within the subject areas. Taken together we ask: What topics and approaches must decay in order to invite new ones? What do we wish to sustain? Who gets to choose, and who are the choices for? In searching for regenerative capacities

to answer these questions, we find hope in conversations with educational experts, and seek inspiration and cautionary tales, regarding how teachers and teacher educators are engaging, or failing to engage, with these issues.

Interview Methodology

We set out to interview researchers and teacher educators in SSHE and adjacent fields (see Figure 1 below) in order to gather observations of the field, and their experiences, ideas, and sources of inspiration. The intent of this qualitative inquiry was to identify 1) where, and with whom, work is already occurring in Ontario to infuse SSHE with environmental knowledges, dispositions, and competencies; and 2) what work is occurring in other fields, such as Indigenous land-based learning or environmental history, that may be adapted and brought more robustly into K-12 SSHE programs. As historically minded researchers, our hope is to build on and learn from existing efforts and capacities (McGregor et al., 2021). With approval from Queen's University's Research Ethics Board, Heather conducted 13 interviews with teacher educators and researchers primarily located in Ontario universities, or whose research is focused within the Ontario context. Prospective participants were identified through pre-existing professional networks. Although the recruitment of participants was not intended to be representative of higher education in Ontario, we engaged with a range of perspectives and locations including 8 universities, from 9 different locations.

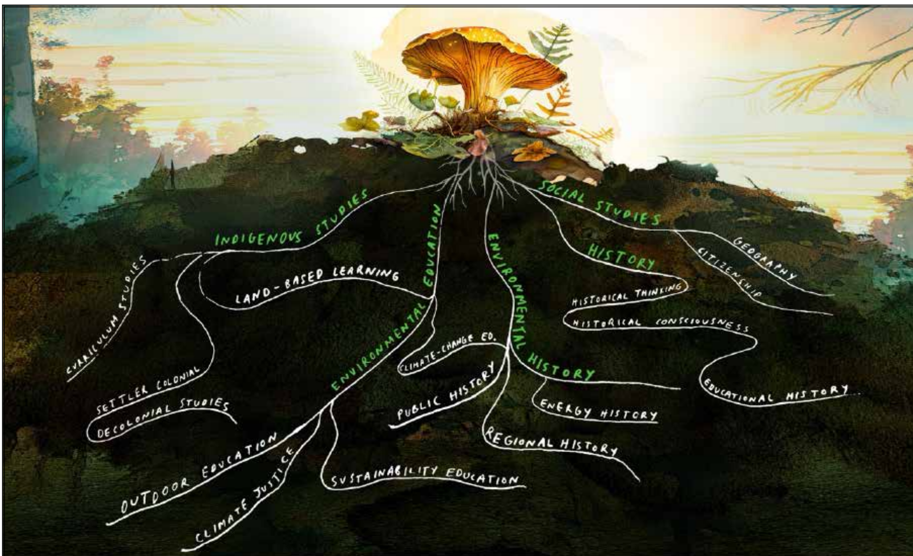

Figure 1. Visual representation of fields with which interview participants affiliate (Flavin, 2023).

The above figure visually represents the range of expertise we accessed through this set of interviews. We imagine the mushroom at the top as the fruit, or the findings, of our research labour. It was our primary aim to engage with experts coming from the hyphae (threads) of "Indigenous Studies," "Environmental Education," "Environmental History," and "Social Studies and History Education." From those four prominent hyphae, there are other mycelial (networked) offshoots that represent sub-fields, as well as related research and teaching areas the interview participants identify with and participate in (e.g., sustainability education, decolonial studies, historical consciousness, geography education). In this article, we feature findings from across all the interviews that focus on Indigenous knowledges and relationality, including interviews with two Indigenous-identified scholars who work in faculties of education and represent different Indigenous Nations and communities.

Each participant took part in one semi-structured interview that lasted approximately one hour. Open-ended questions invited the participant to describe how the environment and climate change arise in their courses, either intentionally or organically, and whether they observe environmental content in their other research, teaching, or professional development work. Strengths in the field(s) in which participants work were solicited, alongside intersections of their field(s) with SSHE. The interviews narrowed-in on potential overlaps, complementarities, and/or collaborations in response to the climate crisis. Participants were asked to consider what SSHE should focus on to prepare youth for a precarious future, particularly when considering issues of equity, social justice, reconciliation, and decolonization. Additionally, we sought ideas for topics, projects, classroom lessons, and/or activities that could fruitfully contribute to the priorities discussed. Our findings have been arranged into "barriers," "strengths," and "suggestions for the future," in an effort to distil and shift practice in the field. We pursue this arrangement while also recognizing that lived experience within these categories inevitably fail to adequately represent, contain, or differentiate from one another when faced in practice (one moment's barrier is another moment's strength, etc.).

Barriers to Centring Indigenous Perspectives: The Background

Thinking more broadly about the need for land literacy and our ability to make meaning and reinterpret what land is so desperately trying to tell us, I think, is greatly impeded by settler colonialism…
– Interview participant

Here in Canada, we don't like those uncomfortable conversations about how Indigenous people have been subjected to genocide and mistreatment, but the environment has been also subjected to genocide, really, so how do we bring that together?
– Interview participant

It must be understood that certain affordances and limitations provide a crucial backdrop to what is being shared here: our work flows through schools and universities that are settler colonial institutions, which continue to be shaped by, and contribute to, perpetuating systems of settler colonialism (e.g., profiting from stolen land, perpetuating Eurocentrism, excluding knowledges that threaten capitalism, etc.). We feel it is essential to acknowledge this, as it is impossible for us to avoid our roles in schools and universities that enact harm upon the land, as well as harm and exclusions upon learners, and largely disregard our responsibilities toward other species and living systems. Many of the specific ways this was expressed in our interviews will be familiar to readers, and have consequences more deeply felt than our words are able to convey. We bring attention to these colonial logics (Donald, 2009; 2019) and manifestations to avoid desensitization to them, and to work against them, again and again, in old and new ways, insofar as we can from our positions as white settler academics, and to create more space for Indigenous resurgence.

The presence of and potential for Indigenous perspectives in university and professional settings

When it comes to considering the potential for Indigenous land-based learning to intersect with SSHE in university settings such as teacher education, the relatively few Indigenous scholars who are employed by universities and the outsized pressure and responsibilities on them is a significant challenge. The barriers to involving Indigenous knowledge holders as co-teachers in university course instruction, if they are not university employees, is an example of how rigid institutions can be, even where they express commitments to reconciliation. Our participants shared other notable challenges with navigating discussions of settler colonialism, decolonization, and climate crisis, in light of potential student resistance, defiance, or classroom controversy. Early career professors are especially aware of the weight that course evaluations and perceptions of colleagues can have on whether they receive tenure. Tenured professors are not immune to backlash from students against anti-racist and decolonial teaching approaches. Additionally, harassment policies and procedures are not always robust enough to support faculty within their institutions.

One participant noted specifically that within university History departments, decolonizing theory is often absent, let alone prevalent. As a result, teacher candidates who hold undergraduate majors in History do not arrive in social studies or history teaching methods classes with enough preparation for unsettling colonial narratives or turning towards Indigenous ontologies and epistemologies. Other barriers involve token treatment of Indigenous knowledge within universities and schools, and the deep-rooted problem of Indigenous knowledge being viewed as static and stuck in the past. When institutions do make attempts to work towards decolonizing practices, they can lose meaning

if taken up superficially, or in a static way. For example, land acknowledgements should serve as important opportunities to connect history, land relations, and decolonizing imperatives. But, when there are expectations to engage in acknowledgement through a fixed script (as is the expectation in some schools and universities) in a way that does not include personal commentary or tangible actions reflecting present-day settler responsibilities, the practice loses meaning.

The readiness of non-Indigenous students and teachers to engage with Indigenous perspectives

Other barriers mentioned by interview participants involve non-Indigenous people navigating their positionalities and relationships to the land. Most participants raised the issue of non-Indigenous teachers feeling a range of uncomfortable emotions while working with Indigenous content, including paralysis and fear. Professors often hear settler teacher candidates state that because they are not Indigenous, they feel like they cannot take up certain topics within their classroom, or guide land-based learning. In many cases, students at all levels of education also seek to avoid feelings of discomfort, particularly when discussing difficult histories they may associate with Indigenous education. We heard evidence of outright rejection when it came to centring Indigenous content in higher education by teacher candidates who expressed white nationalist rhetoric while undermining an assignment focused on Indigenous cultural recognition.

Participants mentioned the whiteness and affluence of the climate change movement or environmental action groups as a barrier for involvement by racialized youth, or youth from a range of socio-economic and ancestral backgrounds. For example, one participant noted that students have informed them of being turned away from the school's environmental education club on the basis of not being critical enough (i.e., members needed to be vegan) to be "part of the solution." They question whether school or university environmental groups allow "white folks to feel good about themselves," rather than acknowledging their privilege and the connections between ecological harms and ongoing settler colonialism. For this reason, one participant expressed their hesitance to bring climate change to the fore in the classroom altogether, at the risk of prioritizing white suffering over the needs and calls to action from Indigenous communities.

In naming these conditions the "background" our intention is not to imply that they can be taken for granted, or that they are experienced in a uniform way. Indeed, we hope our work contributes to shifting attention toward ways in which settler colonialism shapes educational practices and collapses complex conversations, including those of environmental importance with those of settler interests. Here, the background is ever present, and must resist settler moves to innocence (Tuck & Yang, 2012). Additionally, these issues often intervene

actively in lived experience for some individuals, and, depending on how they are positioned, cannot be deferred to the background. In the next section we outline the issues that most closely relate to the intersection amongst climate change education, Indigenous knowledges, and history education.

Barriers to Centring Indigenous Perspectives in SSHE: The Foreground

The overarching barriers discussed above have implications for training teachers, providing professional development, and supporting educational change in school settings. In addition to the ways in which these dynamics affect everything in universities and schools, we identify several considerations linked directly to potential reforms within SSHE, and therefore foreground this inquiry.

Pedagogical limitations

Some of our participants discussed feeling inhibited as teacher educators by an unwillingness on the part of teachers and teacher candidates to approach history from critical, experiential, activist-, or future-oriented pedagogies. One noted that it is common for teacher candidates to want to build their content knowledge of history, and learn how to engage their students in analyzing primary sources within the classroom. However, very few are interested in land-based learning, and other pedagogical opportunities to bring in diverse perspectives and experiences of history (e.g., oral history, traditional stories) or mobilize history for present and future purposes. One participant observed that, speaking generally, social studies teachers at the elementary level seem to be more open to considering new approaches, whereas—in contrast—many high school history teachers respond that this is "not what they do" when introduced to unfamiliar ways of thinking and learning about history. SSHE that centres Indigenous cultural practices, ecological relationships, and embodied learning will be necessarily constrained if modes of knowledge engagement continue to be limited to fact-heavy slide decks, note-taking, and multiple choice questions.

Curricular limitations

Curriculum creates both affordances and barriers at all levels of education. As a result of the Truth and Reconciliation Commission of Canada, the focus on histories and present-day legacies of Indian Residential Schools in school- and university-based history curricula have increased. However, more than one participant reported that teacher candidates and teachers still lack basic knowledge of other topics related to Indigenous experiences over time, and do not arrive in class with critical perspectives on settler colonialism. Furthermore, residential school histories often exclude consideration for environmental

relationships, or they communicate an inevitability around separation between Indigenous communities and their territories. Even in stories that detail the removal of Indigenous children from community, there is still a lack of focus on how relationships to land was, and continues to be, disrupted through school attendance and other colonial interventions. Participants emphasized that learning about actions taken to redress historical and contemporary injustices towards Indigenous people have the potential to better connect students with climate crisis. In the process, students can be more comprehensively guided to think about how they are personally implicated and what actions on their parts may be warranted. Although curriculm is viewed by many as a barrier, in at least one case a teacher education program enacted significant overhaul to a curriculum methods course in social studies to reframe and centre Indigenous perspectives and worldviews, demonstrating that it can be a vehicle for change.

Some participants' anecdotal observations suggest in-service teachers are not receiving enough orientation to environmental education and Indigenous studies, and in some instances are not aware of curriculum and policy documents that can support them. These observations reveal a need for professional development opportunities for in-service teachers, focused on crucial intersections between environmental and Indigenous studies. Identifying these barriers—related to teaching and learning generally, and SSHE more specifically—is important to improving current teaching and learning practices and reimagining possibilities for the future.

Strengths within SSHE for Centring Indigenous Perspectives

Our participants viewed responding to climate crises, concurrent with the centring of Indigenous perspectives within school-based teaching and higher education, as a strong approach. We will touch on this before discussing the specific strengths of social studies and history as a subject area. The first strength involves the inherently intertwined nature of Indigenous education with environmental education (here we are referring to Indigenous education as practiced by Indigenous instructors through their own pedagogies, as opposed to only learning *about* Indigenous people in typical school settings). Where students in different educational contexts are accessing opportunities to participate in Indigenous-led land-based learning and outdoor education, they are being introduced to more diverse and preeminent ways of relating to the land, and more-than-human beings. Centring the land in these ways helps students experience the interconnectedness and interdependencies among species and place. As one participant shared with us, "When you're decolonizing, one of the gifts of engaging with distinct Indigenous perspectives is that you can talk about spirit, you can talk about the heart, you can talk about these things..." Another strength is that students at all levels of education are already expressing an awareness of climate change and its associated problems,

even if they are unsure of what to do about it. Higher education classes offer fertile sites to help students discover how to grapple with a changing climate. Discussions of climate change can be framed in ways that prioritize respectful land relations, acknowledge Indigenous insights, and feature Indigenous land protection initiatives.

Next we turn to discussing the strengths of SSHE for responding to climate crisis and centring Indigenous perspectives, as a foundation from which teachers, teacher educators, and researchers can expand. Five overall strengths were identified through our interviews, specifically at the intersection between SSHE and Indigenous knowledges: SSHE is inherently interdisciplinary, aims to teach questioning and critical thinking, invites multiple perspectives, features relationships, and contributes to a sense of place-consciousness.

Inherently interdisciplinary

Adequately attending to the multiple contributing factors and problems that are part of climate crisis, and proposing relevant solutions, requires an inherently interdisciplinary approach. Social studies already exists in the curriculum as a subject area that ideally brings together history, geography, civics, and politics in ways that can illustrate the complex and intersecting dimensions of environmental challenges. All aspects of social studies and history should be considered relevant to teaching climate topics, and teaching about how humans live well amidst significant change, rather than relegating environmental learning outcomes to geography alone.

Teaches questioning and critical thinking

SSHE, in its best forms, invites questioning, interpreting, and critical thinking in ways that challenge, rather than reproduce, the status quo and normative ways of knowing. Well-crafted prompts can produce shifts in perspective and allow for richer engagement with any topic, including climate crisis. For example, "how can we understand the decisions of different communities when their histories, contexts, and environmental conditions may differ from our own local community?"

Invites multiple perspectives

Within SSHE, most teachers recognize and demonstrate to students the benefits of considering multiple and diverse perspectives when attempting to understand the past. As noted, SSHE teachers are increasingly committed to including Indigenous perspectives and experiences in their lessons. Whether in research or teaching, SSHE often spotlights the question of whose voices are telling the stories and whose voices are being denied, ignored, and/or avoided—ideally seeking to include and amplify those marginalized voices.

Features relationships

SSHE examines relationships, and often features how power mediates those relationships. In moving away from anthropocentrism towards relationality with the more-than-human, and a pursuit of collective wellbeing over individualism, the importance of land relationships can surface. Indigenous epistemologies and ontologies centre relationships with other humans, more-than-humans, and the land. They often do so in ways that emphasize the generations who came before and the generations who will come after. This approach may better frame a worldview and historical consciousness in which the environment is centred.

Sense of place-consciousness

Conversations about climate change benefit from understandings of the past, present, and future, and opportunities for reflection on how we are situated in time, and that time is always passing. This pursuit clearly falls within the mandate of history teachers, but also is ideally combined with how time unfolds on *this land* and, in a holistic sense, in *this place* (Marker, 2018). More than simply emphasizing geography learning outcomes, in order to have a sense of place-consciousness there is a need to understand histories of the land from the perspective of the land. Through the addition of Indigenous perspectives, oral histories, and engagement with land as teacher, SSHE allows for just such an enhanced place-consciousness, which can then be applied to consider what the land, water, and more-than-human neighbours need from humans to experience sustainability into the future.

Suggestions for the Future

In pursuit of regenerative capacities for SSHE, suggestions in this section are grouped into two categories. The first represents those that will likely be familiar to social studies and history teachers. This is followed by content that is perhaps less familiar, given the training, resources, and current practices in the field.

Studying histories of disconnection and displacement

The past offers insights into what happens—culturally, linguistically, economically, etc.—when humans are disconnected from their ancestral lands. The consequences of displacement for humans, and for the land, are considerations that can be taken up alongside strategies to cope with times of great change. An example is learning about how Indigenous youth who were apprehended into residential schools, or into the child welfare system, were prevented from learning the place-based knowledges that would have enabled

them to live off the land, had they chosen to as adults; and, how some may still be able to reclaim these traditional skills through cultural-political actions.

Prioritizing environmental relations

SSHE could enable educators to help their learners confront why deep and reciprocal relationships with the environment are not a feature of some worldviews. They could be engaged in questioning how environmental challenges came to be, leading to an examination of how capitalism and resource extraction have shaped the values dominant in settler cultures. Or, by examining how some cultures take certain values for granted—such as the importance of of transferrable skills, and a willingness to relocate for employment opportunities—whereas other humans have not found such values helpful, desirable, or relevant to their families and livelihoods. Students may be invited to examine implications arising from different values that support a willingness to protect the ecological and land relationships on which we all rely.

Privileging Indigenous knowledges and local contexts

Indigenous knowledges provide a textured starting point for teaching local environmental histories, and/or human relationships to what are sometimes called "natural resources" over time. This is a simple but important way to bring in knowledges that work against anthropocentrism, that are local and continuously intertwined with specific ecologies, and that may also serve to deconstruct the privileging of written accounts over oral histories, or scientific accounts over community knowledges. Our findings suggest that educators start the work of developing intimate knowledge of the land they reside on by way of being outside, on the land, and not simply discussing land as an important but abstract Indigenous concept inside the classroom.

Taking a species-centred approach to curriculum

There is great potential in taking a species-centred approach to curriculum, with an emphasis on Indigenous knowledges throughout—instead of an anthropocentric, event-oriented curriculum. There are history books and undergraduate history courses that centre a species and explore how human relations with it have changed over time (e.g., Bonnell & Kheraj, 2022; Dean et al., 2017; Tsing, 2015). However, this approach is rarely considered or integrated in K-12 teaching. A participant shared a compelling example of a curriculum "bundle" (module and resources) developed by a teacher candidate that focused on ancestral teachings of salmon. The bundle provided an interconnected curricular map of considerations for studying salmon across various grade levels and subject areas, including culinary studies, ecosystems, and young adult literature. Such an approach offers students a layered perspective on the

relationship between humans and salmon, while also revealing the natural intersections between Indigenous knowledges and the challenges of the climate emergency. The participant who shared the example emphasized this link: "You really can't begin to scratch the surface of looking at our most vulnerable animal populations without being confronted by the limitations of climate change." Other examples shared with us in our interviews included the study of corn and the tracking of sweetgrass.

Below we share Figure 2, which illustrates our own interpretation of the vast potential in creating a species-centred curriculum, including the kinds of transdisciplinary themes that could be explored with different species.

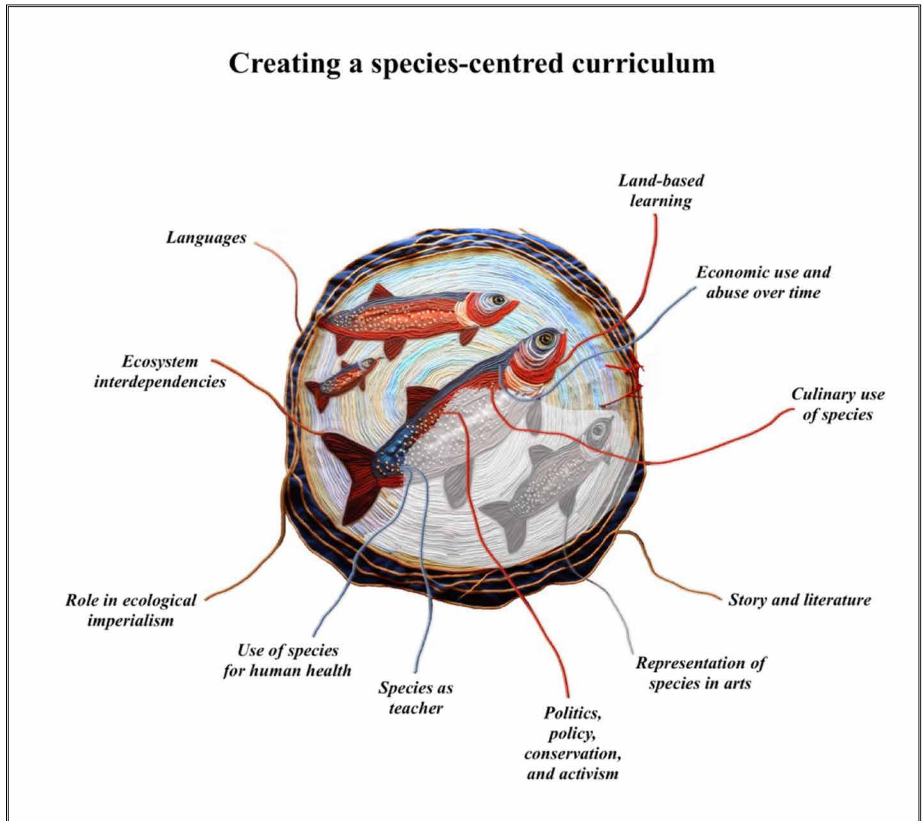

Figure 2. Creating a species-centered curriculum (Flavin, 2023)

Engaging futures thinking

In relation to teaching social studies and history, Kent den Heyer (2017) argues that teachers refer to the future superficially. He points out that in practice teachers

do not invest time in analyzing how the past shapes the present, or how what we know and do now will make various future scenarios more or less likely, and are dependant on how we interact with the driving forces at play (den Heyer, 2017). What we are adding here is that Indigenous communities intentionally privilege the generations to come in their understanding of their responsibilities to the Earth, often referred to as the seven-generation principle (Bell, 2020). Therefore, inviting students to understand how Indigenous communities, local to schools or universities, conceptualize human responsibilities to past and future generations, can be an important call to action. Futures thinking, which is prominent in climate fiction, documentaries, and academic publications, brings with it an emotional valence and by extension may engender hesitance on the part of teachers. As one of our participants explained:

> Arguably, to study the past does help us to at least locate ourselves today… but how is it that we can place equal importance on understanding: these are the systems we work within, and these are the limitations we work within. How, then, can we be very purposeful with imagining *realistic* futures? That sounds doom and gloom, but it is. It is that sense of realism and of grounding. I think that would be one of my biggest hesitations: how do we do that in a purposeful way, beyond fantasy and romanticization?

By retaining a focus on the fact that there are multiple possible future scenarios, and that we can engage and take action to interact with the driving forces that shape what future scenarios are likely to come to fruition, we can utilize any resulting hesitance that follows, along with any attendant emotions, by channeling them towards hopeful action. Taking climate futurities beyond fantasy and romanticization requires imaginative work to envision changing systems—to alter the forces behind what makes imagining alternative futures so difficult.

Dwelling in moments of spiritual ecological connection

Think of a moment when the Earth moved you—moved you to feel; moved you to learn; moved you to change. Think of that place you found yourself in, or that being you found yourself face-to-face with, when you began to have insight into the spiritual, the metaphysical, the more-than-human energy that exceeds language, rationality, even corporeality—that interrupts your business-as-usual. Some of us have previously written about moments or places that have given us these kinds of insights and experiences, and that we have allowed to interrupt us (McGregor et al., 2022). In doing this, we are actively tapping into our own pasts, our own sense of continuity; our own consciousness and perspectives, about where we have come from, and what meanings attach to those connections.

All classes—all programs—should make space for experiences and connections that nurture our interrelatedness with the planet (Bell, 2020). This is no less relevant or urgent for a math class, history class, art class, or an

English class, than for an environmental studies class. We must get outside; we must be in relation with our surroundings; we must dwell in the insights that come from recognizing, as Anishinaabe scholar Nicole Bell puts it, “we are the most insignificant beings on this planet because we cannot live without the life-givers […] yet the life-givers can exist without us, and perhaps the planet might be all the better” (2020, p. 68). Acknowledging spiritual elements to self and knowledge is to recognize students as whole and complex beings, and allows for a sense of connectivity to help ground knowledge claims.

Preserving and nurturing our willingness to struggle

Synthesizing the conversations we had in conducting this research, we recommend preserving and nurturing our willingness to struggle, individually and together. One of our participants expressed this well, in respect to learning ways to bring Indigenous pedagogies into their classes. They talked about unlearning the desire to be the expert, problem-solving teacher-educator, saying “I’m a few years ahead of the [teacher candidates] in my journey, but I’m also just alongside them.” They went on to say, “everything that is around us is also teaching us […] learning *to be alongside* has been an important part of my journey, I think, for decolonizing and centring more Indigenous pedagogy.” Learning what it means to teach, as environmental devastation comes upon us, is about learning to be alongside—and not in a way that shifts responsibility onto younger generations, but that signals how *we are in this together*.

Regenerative Capacities as We Look Forward

Together, we are deeply challenged to find ways to make our teaching meaningful as we scroll through, or experience first-hand, the news and research about environmental crises like flooding and forest fires, severe drought, coastal erosion, species extinction, forest clearing, and environmental racism. For some of us eco-care, eco-empathy, eco-compassion, and love for the Earth (Hickman, 2020) have long been a salient feature of our lives—not something new. Suffering brought on by technologies for wealth accumulation, at the expense of particular groups of humans and more-than-human beings, is also not new. Impatience with legal, economic, and social systems that are slow to change is an enduring feature of both environmental activism and decolonizing efforts, and will continue to be, long into the future. For us, it is easy to agree with Claudia Ruitenberg (2020), drawing from Lauren Berlant, that there is no “better and more devastating phrase and explanation than ‘cruel optimism’ for the paralyzing, self-sabotaging continuation of old habits in the face of current climate crisis and environmental degradation” (p. 833).

In bringing attention to these “old habits,” and responding to the imperative to closely examine what contributes to continuity *and* change in human experience

over time, we foreground Indigenous and non-Indigenous, human and more-than-human, ethical relationality in our approach to social studies and history education. This effort will necessarily require a rebalancing of topics, content, and skills that we use to teach. Much must be let to decay, with urgency—and so be it. Ruitenberg (2020) laments, "we dither and totter, including in educational courses and programmes that promise some opportunity for redemption and transformation, but ultimately change nothing" (p. 833). In the spirit of departing from that old habit—in the face of old barriers, and leveraging the good that may be squeezed from precedents found in teaching and learning social studies and history—let unlearning and relearning happen alongside each other. Papaschase Cree scholar Dwayne Donald (2019) explains, "we are enmeshed in a series of relationships (human and more-than-human) that give us life," (p. 121) and we have much work to do to sustain them. As Bell (2020) teaches, each human has a responsibility to use our gifts for the goodness of all. Patty Krawec (Anishinaabe) (2020) invites settlers living in Canada to pick up their own "bundle"—the things precious to us and connect us to our relatives, histories, memories, stories, responsibilities, and cares—in moving towards "becoming kin" to Indigenous peoples: "look at those things with new eyes" (p. 20). We crave the regenerative capacities we associate with sustaining our relations, and applying our gifts, for the goodness of all life, and to look anew at our memories and stories. We propose that a starting point for SSHE teachers is to "pick up their bundles" in search of regenerative capacities that includes studying histories of disconnection—prioritizing environmental relations, centring Indigenous knowledges and local contexts, taking species-centred approaches, engaging in futures thinking, dwelling in moments of spiritual ecological connection, and preserving and nurturing our willingness to struggle.

Notes

1 We are developing lessons and other teaching resources for social studies and history classrooms, conducting curriculum analysis, developing extended theoretical analyses, and pedagogical suggestions based on the literature in history and other disciplines – and conducting interviews with experts (see: www.sshean.ca).

2 Here we are pointing towards the Indigenous conceptualization of place as theorized by Arapaho scholar Michael Marker (2018), including, but not limited to, "the complex social reality entangled with colonialism, the ecological history, and the cosmologies of Indigenous relationships to other-than-human and more-than-human ancestors" (p. 458).

3 It is important to note that Tuck et al. (2014) describe land education as shorthand for "land, water, air, and subterranean earth" and that these situated relationships are "diverse, specific, and un-generalizable" (p. 8). Land education can occur in urban spaces as well as those that are visibly

greener, and land pedagogies deal not only with the materiality of land, but the spiritual and emotional dimensions of relationships to land. These understandings of land are situated in collectivist Indigenous ontologies that defy settler colonial notions of property. This conceptualization of land education is described by Tuck et al. (2014) as distinct from the literature on place-based education that has been a prominent thread of the environmental education movement, and yet contributes to settler emplacement and futurity. Recognizing this citational and conceptual legacy, as outlined by Tuck et al., we also acknowledge that some Indigenous and ally scholars continue to utilize and extend the concept of place.

Notes on Contributors

Heather E. McGregor is an Assistant Professor of Curriculum Theory at Queen's University in Kingston, Ontario, Canada. She is the Principal Investigator of the Social Studies and History Education in the Anthropocene Network, dedicated to reimagining history and social studies education to address climate change and its associated ecological, economic, political, and social challenges. Heather has published in a range of Canadian and international journals on topics including the history of Inuit education and curriculum change in the Canadian Arctic, decolonizing research methodologies, experiential learning, and theorizing learning in the Anthropocene.

Sara Karn is a Postdoctoral Fellow for Thinking Historically for Canada's Future, based at McMaster University. She received her PhD from Queen's University, and her research focuses on historical empathy within history education in Canada. Sara's research, publishing, and teaching spans the fields of historical thinking, experiential learning, and environmental and climate change education. She is also a certified K-12 teacher in Ontario and has taught environmental education courses for preservice teachers.

Micah Flavin is an M.Ed. student at Queen's University and an Outdoor Educator with the Limestone District School Board. He identifies as a settler with mixed Irish/Jewish ancestry, and is currently living on traditional Anishinaabe, Haudenosaunee, and Huron-Wendat territory. Since completing his B.A. in Psychology at McGill University in 2017, he has worked extensively as both a special educator and interdisciplinary artist in Tiohtià:ke/Mooniyaang (Montréal, Québec). Micah is interested in developing arts-based pedagogies that respond to the magnitude of the climate crisis and its interconnectedness with socio-economic structures.

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Wisdom from Lichen: The Ecology of Anti-oppressive Environmental Education

Sarah Urquhart, University of Toronto

Abstract
Ecologically, lichen plays a significant role in the formation of flourishing ecosystems by breaking apart rock formations using small fungal threads to form fertile soil which supports a growing complexity/diversity of life. This essay uses lichen as a metaphor to describe fossilized constructs (colonial epistemologies and ontologies, neoliberalism, and white centered environmental racism) that need to be eroded within traditional environmental education. Then, lichen-supported biodiversity is used to discuss conceptualizations of decolonizing and queering ecopedagogy which can promote anti-oppressive environmental education that (re)orients and prioritizes flourishing and thriving.

Résumé
Sur le plan écologique, le lichen joue un rôle fondamental dans la formation d'écosystèmes florissants en désagrégeant les formations rocheuses à l'aide de petits filaments fongiques pour former un terreau fertile, substrat d'une vie complexe et diversifiée. Dans cet essai, le lichen est une métaphore décrivant les constructions mentales fossilisées (les épistémologies et les ontologies coloniales, le néolibéralisme et le racisme environnemental à domination blanche) tout en faisant valoir la nécessité d'effriter aussi certains éléments de l'éducation à l'environnement traditionnelle. Le rôle du lichen dans la biodiversité sert aussi à conceptualiser la décolonisation et la queerisation de l'écopédagogie, afin de mettre en lumière leur capacité à promouvoir une éducation à l'environnement anti-oppressive qui (ré)oriente, en en faisant une priorité, les processus de développement et de prospérité.

Key-words: environmental education, ecopedagogy, (de)coloniality, lichen metaphor, neoliberalism, queering ecopedagogy

Mots-clés : éducation à l'environnement, écopédagogie, (dé)colonialité, métaphore du lichen, néoliberalisme, queerisation de l'écopédagogie

Setting the Scene

It was less than an hour until midnight as I surveyed the view. The summer solstice was just days away, and twilight hues made the sight in front of me even more captivating – mountain peaks to my left and right, with a clear path down the central valley composed of jumbled rock, covered in a grey-brown lichen that

was rough to the touch. I was viewing a landscape shaped by a lava flow from three centuries ago at Anhluut'ukwsim Laxmihl Angwinga'asanskwhl Nisga'a in northern British Columbia—otherwise known as Nisga'a Memorial Lava Bed Park. What resonated with me on that land was not the large mountain peaks, but the understated lichen slowly, yet powerfully, transforming the land. What wisdom can lichen share with us? And how can I apply what can be learned from lichen ecology to the study of anti-oppressive environmental education, or ecopedagogy?

My experiences as an educator of students from diverse racial, cultural, linguistic, geographical backgrounds prompts me to acknowledge the problematic ways in which western colonial constructs of environmental education and a dualistic human-"nature" divide cause and perpetuate hegemony and oppression. A foundation of 'ecopedagogy' closely aligns with "unveiling these hidden politics" of "socio-environmental oppressions and planetary unsustainability," while also aiming for transformative praxis (Misiaszek, 2020, p.17). In some circles, environmental education theory and praxis is narrowly understood to simply mean learning 'about' the environment. But there is a larger need for a pedagogy that challenges us as educators to uncover epistemological assumptions that have been ignored. The interconnectedness of all and can invite us to embrace an inclusive "planetary citizenship" (Misiaszek, 2020, p. 23). Misiaszek (2021) elaborates that it is the "critical questioning of the unquestionable, the normative 'common sense', that makes ecopedagogies radical in the work for praxis" (p. 61). This essay will explore some of the normative assumptions that perpetuate oppression within educational settings. Mignolo's *Colonial Matrix of Power* (2018) provides further theory in this critical review of environmental education to support a decolonized ecopedagogy as a basis to foster transformative and anti-oppressive environmental education.

Why lichen?

Ecologically, lichen is called a composite organism – a combination of algae or cyanobacteria with fungi in a symbiotic relationship. Lichen are often the first organisms to grow in newly emerging ecosystems. They are found on bare rock and often thrive despite extremely windy, cold, hot, dry, or damp climatic conditions. Ecologists even call lichen "magic" as "they perform feats of biochemical spellcraft essential to the boreal environment" (Fox, 2020). In many biomes, lichen is a foundational organism required to support a thriving network of life. In the Nisga'a traditional territory, lichen is called *bilak* and the ecosystem thrives with more than 250 different lichen species on the lava beds (Burton, 2012, p. 163).

As with lichen, I envision ecopedagogy as similarly resilient and essential to support the flourishing of life – with the capacity to invoke a little magic as well. Rhee and Subreenduth (2006) ask, "[h]ow should we rethink and rearticulate the conceptualization and practice of education and research when we situate them

within contemporary imperialism and the history of pervasive colonialism?" (p. 546). An instinct in responding to this question is to (re)turn to ecology to find the lessons from the "more-than-human" world.

In the first half of this essay, I use the eroding properties of lichen in an ecosystem as metaphor to explore facets of environmental education that need to be dismantled in a move towards anti-oppressive ecopedagogy: colonial epistemology, neoliberalism, and environmental racism. In the second half of this paper, I extend the lichen metaphor and use its ecological significance in initiating thriving, biodiverse, and complex ecosystems to suggest ways of equally diversifying and pluralizing ecopedagogy for anti-oppressive flourishing.

Figure 1. Anhluut'ukwsim Laxmihl Angwinga'asanskwhl Nisga'a lichen covered rock by Sarah Urquhart (2018).

Wisdom from Lichen

First Wisdom: Eroding Fossilized Surfaces

Lichen is known for its role in the succession of ecosystems as they change from bare rock surfaces to biodiverse climax communities. Lichen dismantles rock surfaces and transforms outer layers of rock into emerging soil using a combination of acids to chemically break down the minerals, along with small

fungal threads that permeate small cervices and cracks. Using these methods, lichen find the 'weak' spots in rock façade to slowly degrade and fracture monolithic formations (Adamo et al., 2002).

Drawing from the Nisga'a Lava Beds in my opening scene, it is possible to connect the volcanic eruption and lava flow that overtook the valley floor – estimated to have occurred during the 1700s – as a metaphor for the destructive entrance of European settler colonizers on unceded land. To some Indigenous communities, rock formations are called Grandfather Rocks and they hold wisdom and stories from ancestors (*Manitoba Rocks!*, n.d.). The existing wisdom and knowledge of Grandfather Rock was quickly obscured and replaced by the lava flow that hardened to rock cover. In this metaphor, the newly fossilized rock formations represent entrenched facets of environmental education that are complicit in many of the colonial, neoliberal and racist education systems that operate within society (O'Brien & Nygreen, 2020). Ecopedagogy, like lichen, can erode and degrade the many assumptions about the land and human-land dichotomies that colonialism imposed on existing wisdom and ways of being. This metaphor is used with recognition that in vilifying aspects of the more-than-human world, like rock and lava, is misaligned with many Indigenous ontologies. Instead, the metaphor is used to call for an openness and "two-eyed seeing" (*Etuaptmumk / Two-Eyed Seeing and Beyond*, n.d.) that places value on the foundations of Grandfather Rock wisdoms and seeks to "liberate knowing and becoming what coloniality of knowledge and being prevents to know and become" (Mignolo, 2018, p.136).

Eroding Colonial Epistemology and Ontology

Using the lichen metaphor, we can ask: which fossilized constructs need to be broken down? First is the Eurocentric colonial epistemology that distinguishes human existence from that of "nature" – that "nature" has been understood to be separate and de-coupled from "human" and viewed as something that humans can/should exert power over. Andreotti (2018) explains that modernity has created a narrow epistemic condition in which, "…we see ourselves as autonomous, individuated and self-sufficient beings inhabiting a knowable and controllable world" (p. 196). This individualism is prefaced on an understanding of human beings as distinct and separate from other forms of more-than-human life and materiality – rather than within a relationship of intimate interconnection. In her discussion of the development of western constructs of "The Human", Sylvia Wynter (2003) traces how the development of western understandings of what it means to be a human (as a rational, individual entity) became entrenched during encounters with Indigenous peoples during the Colombia encounter of 1492, and has been perpetuated in western epistemology/ontology since. This colonial logic of autonomy and individualism has not only separated humans from one another, but also severed human kinship with Land. This separation has created and perpetuated foundations that justify violence and exploitation.

Tuck et al. (2014) note that “it is rare to find explicit discussions of settler colonialism, decolonization and Indigenous conceptualizations of land within environmental education research” (p. 14). Gough (2016) echoes this and outlines how western scientific constructions of ecological and biophysical systems have oriented environmental education since its emergence in the 1960s and 1970s as an “area of study”. Yet anti-colonial approaches to being and learning can act as the fungal threads urgently needed to deepen the cracks within colonial epistemology and ontology as it relates to environmental education.

In practice, we can widen environmental education to encompass much more than just scientific facts about ecology, but need to attune ourselves to the spiritual aspects of ecopedagogy. Some examples would be to view ourselves as in kinship with all other living beings and see our wellbeing as intrinsically connected to the well-being of the more-than-human world. Many forms of traditional environmental education have centered “objective” and “scientific” human knowledge *about* the environment (eg. ecology nomenclature like Latin species’ names; processes such as water cycles; impacts of pollution) as a primary focus. The assumption is that knowing *about* the environment is a goal so that “we” (humans) can manage and control the environment in ways that humans deem best (and only certain identities of humans – white, male, cis-gender – but more about this is discussed later). This hegemonic knowledge structure places human as the most important beings.

Mignolo (2018) suggests that “decoloniality shall focus on changing the terms of the conversation that would change the content. The reverse does not obtain: changing the content of the conversations doesn’t call the enunciation (the terms) into question” (p. 144). It is more than the content of environmental education that needs a rethinking, but the assumptions underpinning knowledge, ways of being, and relationships within that education. A decolonial approach is suggested by Datta (2018), who describes how Indigenous Peoples view land as “relational, which includes the spiritual, emotional” (p. 56) and the more-than-human world as kin. This means we move beyond viewing knowledge about the environment as a utilitarian means to “manage it effectively,” but to prioritize a deep knowing and feeling of the connections amongst entities (human amongst the more-than-human world). In education, we need to recognize and honour the relationships that children and youth form with the world, and later in this essay I will provide examples of how educators can support relational orientations in environmental education.

Cole (2016) importantly states that “advancing Indigenous ecological wisdom and practices as ‘equivalent’ is not about transplanting Indigenous knowledge systems into Western systems rather it is companion planting cultivars with wild types regenerating more complex possibilities…” (p. 8). I am reminded of the ‘Education About the Other’ section of Kumashiro’s (2000) anti-oppressive framework, which cautions that teaching about the ‘Other’ should not be done to “fill a gap in knowledge… but disrupt the knowledge that is already there” (p. 34).

Incorporating Indigenous knowledge and worldviews into ecopedagogy needs to be more than a tokenistic addition to traditional environmental education but needs to be integrated intentionally as to not further marginalize, essentialize or "other" Indigenous Peoples and Indigenous epistemology/ontologies.

Eroding Neoliberalism in Environmental Education

The second fossilized construct we need to break down is the presence of neoliberalism in environmental education. Kumar (2019) identifies that "neoliberalism derives its power from combining capitalism, behaviorism, and positivism, and, therefore is antieducational to its very core." (p. 236). The neoliberal prioritization of market economies has permeated some environmental education discourse, as contested concepts like Education for Sustainable Development (ESD) tether environmental conversations within the sphere of economics and the politics of development, instead of orienting to a relational focus amongst humans and more-than-humans. We can ask ourselves: what do we even mean by "sustainable development"? What are we "developing"? And for whom? Conversations surrounding development often reinforce narrow westernized understandings of modernity and "is a discourse that promises happiness and salvation through conversion, progress, civilization, modernization, development and market democracy" (Mignolo , 2018, p. 142).

Additionally, the neoliberal influences present in school systems such as competition and shadow education can permeate programs and curriculums that are oriented towards environmental education (Kopnina, 2015). As an example, the Duke of Edinburgh (DoE) International Award is commonly described as having elements of environmental education. The DoE Award involves an "Adventurous Journey" meant to challenge students to engage in the "wider environment" to achieve a gold, silver or bronze level award marketed to students as a way to gain prestige and be attractive to competitive post-secondary institutions, particularly in the United Kingdom (*The framework*, n.d.). A program like this could be considered an example of shadow education (Kim & Jung, 2019) as it is meant to supplement academic curriculum, yet it also shapes youth engagement in "the environment" within neoliberal and colonial frames. Viewing "the environment" merely as a context of challenge (and one that achieves an award that serves self-interest) reinforces the dualistic human vs. "nature" construct, as "the environment" becomes utilitarian – something to conquer or overcome through perseverance. The Duke of Edinburgh International Award was initiated by Prince Philip, consort to Queen Elizabeth II, in partnership with education theorist Kurt Hahn in1956, and was designed to help youth "on the journey of self-development regardless of their background, culture, physical ability, skills or interest" (*History & Founder*, n.d.). The development and implementation of the Duke of Edinburgh International Award echoed centuries of British imperialism and colonialism, as it expanded to numerous countries outside of the United Kingdom, inserting Western, post-war educational philosophy upon

various cultures, and shaping the ontological ways in which youth engage with the world. The discourse of self-development is highly focused on individual meritocracy, and reinforces neoliberal narratives that success in environmental engagement is self-determined yet globally defined as overcoming obstacles and perceived discomfort. Additionally, these meritocratic assumptions gloss over ways that social systems privilege or disadvantage certain groups (apparent in reference to the "regardless of their background" description provided above).

A de-imperialist stance would act like the fungal threads of lichen, to penetrate the problematic ways that initiatives like the Duke of Edinburgh Award reinforce global, neoliberal goals, to redirect the purposes and ways in which engagement with the more-than-human world is encouraged and fostered. Chen (2010) writes,

> "[if] this era of globalization is built on the assumption that to reconstruct a livable earth we can no longer allow any form of imperialism to prevail…starting with rethinking the wrongs and pains of past imperial interventions, is the minimum requirements of the present (p.2).

Ecopedagogy can break apart the underlying assumptions disseminated and perpetuated by an imperialistic monarchy and (re)turn other ways of knowing and being. Educators have a responsibility to critically examine the underlying messages and assumptions provided in environmental education. Choosing to disengage from facilitating or promoting programs that are entrenched within the edifices of neoliberalism can provide the space necessary to prioritize alternative ecopedgogical orientations within/toward learning and being.

Eroding White Colonial Centering and Environmental Racism

A third fossilized construct within environmental education that we need to expose and fissure is the racist centering/privileging of white experiences within environmental education. The exclusive, and default representation of white colonial settler experiences within the more-than-human world has marginalized or excluded the experiences of Black, Indigenous, and People of Colour. While this is problematic, racism goes beyond a lack of representation of racial identities in activities typically associated with environmental engagement (such as hiking, camping, gardening). Socially constructed and Western understandings of what constitutes "nature" dominate, and "environments" are portrayed as a neutral spaces that are "absent of social and economic structures," which in turn "conceals histories of violence and dispossession" (Corliss, 2019, p.2). The universalized ways that "white epistemology of wilderness" has consumed environmental education erases the experiences of people with marginalized identities, while alienating, excluding and hindering the efficacy of ecopedagogy (Corliss, 2019). Fletcher et al. (2021) elaborate on how contemporary critiques of "wilderness" focus on the pervasive negative impacts of human activity. However

this erases and negates the ways that Indigenous and local peoples have engaged with the Land from time immemorial. This erasure has been accompanied by 'ahistoricism' and 'depoliticization'(Andreotti, 2018): environmental education has frequently and selectively ignored the entangled emergence of "resource" exploitation, capitalism, militarism, and racism that settler colonialism began and perpetuates in North America (McLean, 2013).

These forms of oppression are not only historical but occur today within racialized communities at higher risks of experiencing environmental pollution and degradation. Environmental racism is defined as "racial discrimination in the disproportionate location and greater exposure of Indigenous, black and other racialized communities to contamination and pollution…" (Waldron, 2020, p. 734). There are several Canadian examples of how spatial and racial violence manifest together, such as in Aamjiwnaang First Nation and Grassy Narrows in Ontario (MacDonald, 2020) and in the Africville and Pictou Landing First Nation communities in Nova Scotia (Waldron, 2018). Educators who offer experiences where students learn about environmental pollution and degradation should not shy away from engaging the intertwined realities of environmental and social injustice and make clear the politics of pollution as all beings are not impacted and implicated to the same extent (Liboiron, 2021).

Traditional environmental education can also be critiqued for its "salvationist" tendencies, which have often oriented environmental education spheres as places "where 'good' white people can maintain superiority by saving both the environment and people of color, which includes Indigenous communities devastated by environmental destruction" (McLean, 2013, p.358). Educators have the capacity to provide students with the opportunity to engage in environmental learning, in addition to an attunement of the historical and contemporary realities of environmental racism and social injustice present in local contexts. Related to this, encouraging a social justice stance is essential to ensure support of environmental education and an activism that challenges, rather than reifies, violence and oppression.

Over time, lichen slowly grows, and expands into small fractures and crevices of rock formation. Similarly, ecopedagogy can and must erode the harmful colonial epistemologies, neoliberal premises, and racialized erasures within environmental education.

Second Wisdom: Supporting Biodiversity

Other than eroding the rockface, lichen plays a significant role in ecological succession by multiplying the existence of additional species and lifeforms within their host ecosystems. Lichens support habitat formation for many diverse species by developing an enriching and emerging soil layer, generating fertile ground for seeds to take root and germinate, providing nesting materials for birds, and camouflaging small mammals (Fox, 2020). Some Indigenous communities traditionally use certain lichen species for medicinal and health purposes, and

thus support human presence within northern climates (Burton, 2012, p.164). Lichens are highly effective at nutrient cycling and photosynthesis, transforming elements from inorganic atmospheric forms to useful, life supporting chemical forms, which in turn create essential complex lifeforms and intricate food-webs.

Diversity and complexity are intrinsically connected. Biodiversity within ecosystems increases ecosystem resilience, as an abundance of interconnected species allow for numerous and dynamic interspecific relationships. Lichens can remind us of the wisdom that (bio)diversity is highly desirable for the stability and flourishing of larger systems. Similarly, diverse approaches within ecopedagogy can support the flourishing of environmental education for a widened community of humans and more-than-human world.

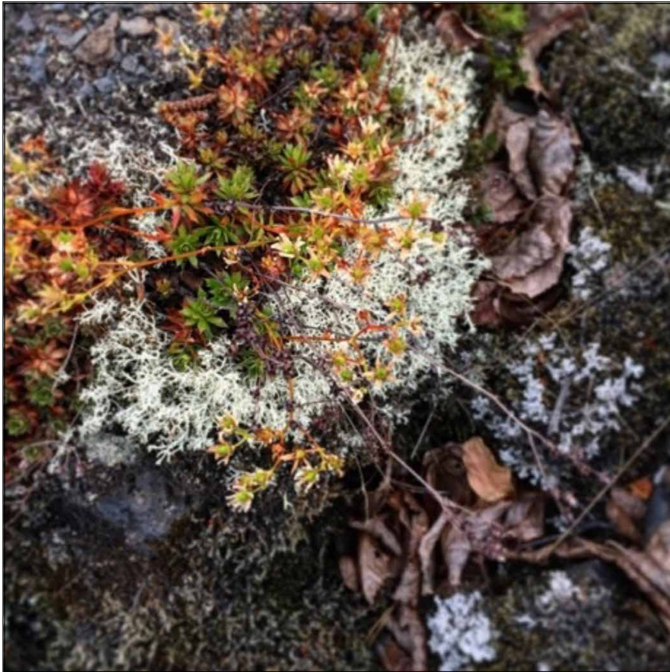

Figure 2. Lichens as a source for flourishing biodiversity by Sarah Urquhart (2018).

False Forms of Diversity

In many instances, there is an assumption that educators operate within systems that allow for choice and diversity of thought. Neoliberalism provides the illusion of "consumer choice" based on the marketization of education. The reality is that neoliberal education reforms privilege certain groups - based

on race, socio-economic status, gender and other identities - and reinforce power differentials, capitalism, and competition that narrow potential choice. For instance, families will often see options for K-12 schooling as disparate – public school, separate schools, private independent schools – yet all remain entrenched within systems that reinforce the assumption that education serves the end of goal of creating an employable workforce oriented within a market economy. Common narratives conceptualize education as a way to widen opportunities for children and youth to find success, but how success is understood and measured remains narrow, while opportunities are not equally accessible (Kumar, 2019).

Additionally, many ways of viewing Land, creation stories, and knowledge have been myopically shaped within narratives of coloniality. Mignolo (2018) points out that Western colonialism and imperialism was “not only economic and political but fundamentally epistemic” (p. 137). What can be understood as epistemicide of Indigenous ways of knowing not only silenced a diversity of thought, but reinforced singular and harmful narratives that further separated the human experience from land. Mignolo (2018) cautions that “modernity names a set of diverse yet coherent narratives, since [Western Christian versions of humanity] belong to the same cosmology” (p.139). The colonization of time, space, and relationalities make it challenging yet essential to recognize true diversity aside from the rhetoric of modernity. Neoliberalism within education and settler logic as epistemicide are the false forms of the diversity it is necessary to resist this in environmental education, as well as education more broadly.

Epistemological and Ontological Diversity in Environmental Education

Rather than accepting singular narratives and onto-epistemologies in environmental education, we need ecopedagogy that more profoundly invites inclusion of a wider range of stories, experiences, and cosmologies. In an explanation of land-based Indigenous education, Wilson et al. (2021) describes the concept of “relational accountability” as an ontological perspective that differs from settler concepts of “self as individual” (p. 222). In contrast, the Indigenous concept of self is best described as “self-as-relationship” – where relationship to ancestors, descendants, the beyond human world – even to ideas and philosophies frames ways of being and knowing (Wilson, 2021, p. 222). If “self-as-relationship” can be viewed as an authentic premise in education, affinity within the more-than-human world becomes possible, as do ways that enable our human beliefs and behaviours to build connections within a complex network of affiliations and proximities.

Educators from early childhood through to tertiary education are engaging with ecopedagogies that (re)center Land-human relationships. Embodied and reflective practices such as “sit spots” and nature journaling have been shown to foster (re)connectedness and attention with the more-than-human world with both kindergarten children and university undergraduate students (Hu, 2022;

Spiegelaar, 2023). Foregrounding Indigenous knowledges and approaches of inquiry can reorient environmental learning to be non-anthropocentric by nurturing, “multisensorial engagements with the more-than-human world” (Nxumalo & Villanueva, 2019, p. 44). Frameworks such as that developed by *Natural Curiosity* can support educators within a range of educational contexts to facilitate environmental learning through an Indigenous lens that prioritizes a sense of spirituality, a deep sense of place, and emphases on interconnection and reciprocity (Anderson et al., 2017).

An openness to diverse ontologies, epistemologies, and cosmologies still needs to be viewed and enacted critically when designing and facilitating learning. Wilson et al. (2021) cautions how some pedagogies that “present or draw on Indigenous ‘traditional teachings’… rely on rigid essentializing constructs or understandings of nature, cosmology, gender, sexuality or other aspects of our cultures, identities and ways of being” (p. 222). When engaging with knowledges that constitute a stretch of our cosmology as educators, we need to do so with an openness and patience that avoids distilling diverse and complex knowledges, or incorrectly reframes them within our existing, and fundamentally incongruent, ontologies. As a person of settler colonial heritage, educated in a traditional, Western scholastic context, there are times when Land-based learning, Indigenous teachings, and ways of being can feel “stretchy” to me, as they exist beyond the colonial frame in which I have been inhered. I seek opportunities to learn alongside my students from Indigenous educators and to invite their voices into my classrooms and teaching contexts. I try to remain attuned to ideas or practices that are challenging to grasp, or cause me to pause. This reflexivity is guided by a capacity to keep an open-mind, prioritize listening, and suspend response– and informs my commitment to intentionally diversify the ideas and relationalities available to my students.

Andreotti (2018) describes how we need “more complex social analyses acknowledging that if we understand the problems and the reasons behind them in simplistic ways, we may do more harm than good” (p. 200). Seeking a diversity of epistemologies, ontologies, or cosmologies then is not about “finding out,” or adding in multiple perspectives just for the sake of it, but is about assessing what has previously been left “unsaid and unthinkable” (Kumashiro, 2000, p. 39). We can receive this wisdom from lichen too. Lichen grows slowly over time, selectively finding an ecological niche fertile for a diversity of life. As well, lichen doesn’t just support diversity for diversity’s sake. Instead, lichen supports a plurality of species in temporal layers, giving rise to multiple species that flourish under ever-evolving conditions.

Diversity of Identities in Environmental Education

Diversity and complexity can thrive within the cracks and crevices of monolithic systems and work to erode dominant monolithic systems. This is true in both ecological systems and in systems of education: diversity can

confront singular identity representation as explained earlier in the historical centering of whiteness in environmental education. Looking to the queering of ecopedagogy, it is possible to think more expansively and explore anti-normative environmental education as a way to illuminate and dismantle "the link between environmental damage and forms of oppression like racism, sexism, and homophobia" (Corliss, 2019, p. 81). In their discussion of queer ecopedagogy, Gough (2021) explains how "[intersectional] analysis and assemblages provide opportunities to deconstruct multiple discourses of oppression – such as the able/strong/male discourse of outdoor education" (p. 175). If environmental education stands a chance at effectively engaging young people with diverse identities and experiences, then it must diversify the representation of humans and the more-than-human world.

Posthumanism also provides a potential theory to move beyond an anthropocentric focus to ecopedagogy, to one that forms relationships and "equity between human and non-human communities," and to embrace complexity rather than "simplicity and certainty" (Gough, 2021, p.176). Posthumanism can be understood as a philosophical movement that decenters human existence and looks to trouble the ways in which "humanity" has centered and shaped notions of modernity. Bayne (2018) explains that

> posthumanism involves us in making an ontological shift from understanding 'the human' as an individuated entity separate from and observant of the world and its (human and non-human) inhabitants, to one which is inextricably connected to the world and only conceivable as emergent with and through it (p. 1).

Justifiably, posthumanism has been critiqued for not acknowledging, "...the ancient presence and contemporary force of Indigenous concepts of human being" (p. 160) and for appropriating Indigenous ecological knowledge into western postmodernist frames of thinking (Bignall & Rigney, 2019). With an awareness of this limitation, posthumanism might still be a helpful frame for educators to challenge anthropocentric environmentalism that focuses on human benefit exclusively at the expense to the more-than-human world. And in addition to posthumanism, concepts of intersectionality, assemblage, and entanglement all embody a diversity, plurality, and complexity that moves away from understanding identities and relationships with(in) the more-than-human world as stagnant, individuated constructs/entities, but rather as fluid, dynamic, interdependent, and non-normative ways of being.

All forms of education have the power to shape our understandings of what it means to live "a good life," as we are an entity amidst the wider network of our kin. In ecopedagogy, it is desirable to consider what a good life means (looks like, feels like) for human life, and with/in the more-than-human world across spans of time. Neoliberalism and capitalism use definitions of market success, consumerism, competition, and dehumanizing systems as avenues toward a narrowly defined and shallow description of "a good life" – and how that life is

designed to only be accessible to a privileged few.

As described earlier, lichen can support the flourishing of many other species. Similarly, engagement with ecopedagogy can support a redefinition of what it means to *thrive* in life – to have our physical, emotional, mental, and spiritual needs met within a wider community that also flourishes without oppression, hegemony, or violence. Russell (2021) suggests that "Queer ecopedagogy invites all of us to experience and imagine ways of being and acting that challenge our notion of what constitutes a 'better' life, including those that seek a more radical change in the world" (p.63). There are multiple examples of how different cultural philosophies engage with the idea of wellbeing and thrive-ability in life – from southern Africa's "ubuntu" (Le Grange, 2012) to Latin America's "buen vivir" (Salazar, 2015). Tran & Khan (2020) define multispecies flourishing as the "needs for survival, transcendence, belonging, dignity and challenge through considerations of land, language, lore (story), living, logic and learning" (p. 1). This would apply to all life on earth, not just human. With care to not essentialize these complex and culturally nuanced concepts, it is possible to identify common notions that orient wellbeing as something that can be understood collectively, in relationship amongst and between beings. In schooling contexts, teachers can introduce these concepts to students as a foundational orientation when engaging with more-than-human worlds – and provide alternatives to common societal narratives about material wealth as a goal for "success." Additionally, when advocating for environmental education opportunities in schools, educators can elaborate not only on the benefits of environmental learning as it serves and benefits students, but to also identify ways in which student wellbeing relates to the flourishing of the more-than-human world. Individual thriving is inherently dependent on the thriving of all beings – ecopedagogy can support this as we move ourselves as educators within community in this direction.

Concluding Thoughts as the Sun Sets

As the summer sun lowered behind the mountains at the Nisga'a lava beds, the shadowed landscape transformed once again with the diminishing light. I stood from a crouched position, breathed deeply, and tiptoed across the rockface, careful not to tread and trample the lichen that can share so much wisdom with us.

Lichen can teach us the value in looking for the crevices and cracks in what might at first appear to be fossilized and immovable ways of being and thinking. In environmental education, we must find the small fissures in dominant western epistemology/ontology, neoliberalism, white-centering, and environmental racism. Lichen encourages us to embrace diversity and complexity to understand the existence of a good life in more expansive ways. Environmental education can be open to a plurality of epistemologies/ontologies,

identities, and perspectives on what "a good life" means for ourselves as well as the more-than-human world.

As I tread carefully across the paths of education, I'll remain mindful of the lessons lichen has to share, and will continue to return to their wisdom as I travel onwards in my teaching and learning.

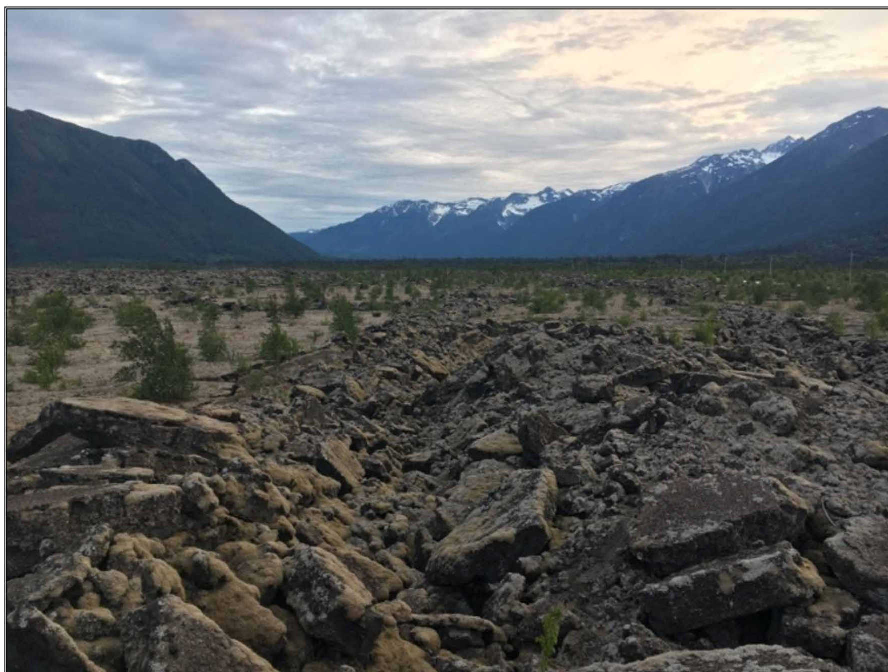

Figure 3. Anhluut'ukwsim La<u>x</u>mihl Angwinga'asanskwhl Nisg̲a'a at Solstice Twilight by Sarah Urquhart (2018).

Notes on Contributor

Sarah Urquhart is an OCT and PhD candidate in Curriculum & Pedagogy at the Ontario Institute for Studies in Education (University of Toronto). Her teaching and research interests are in fostering community engaged, place-based, and justice-oriented environmental and climate change learning in K-12 and teacher education contexts.

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Emerging Leadership Strategies in Environmental and Sustainability Education in Preservice Teacher Education

Paul Elliott, Trent University; Hillary Inwood, OISE, University of Toronto, & Yovita Gwekwerere, Laurentian University, Canada.

Abstract

Environmental and Sustainability Education (ESE) has been a neglected area in teacher education despite the potential it offers for stimulating societal change via the school system. Our work in recent years to promote this aspect of teacher education in Canada led us to reflect on our experiences, the challenges we have faced, and the lessons learned about leading this type of change. The study involved a collaborative action research approach with a series of meetings in which we acted as critical friends and then used coding to identify emerging themes. In this way we were able to identify successful leadership strategies and support each other in our endeavors. By connecting our experiences to theories related to leadership in environmental education, we were able to identify useful leadership strategies. Little has been published specifically related to leadership in this field, so we hope that our findings will assist others in this work and stimulate further research.

Résumé

L'éducation est la clé pour transformer notre mode de vie et nous éloigner des activités qui participent à la destruction des systèmes terrestres nourriciers, le but étant d'adopter plutôt des pratiques garantissant un avenir durable. Devant la gravité des menaces actuelles, plusieurs acteurs du milieu de la formation des enseignants ressentent de la frustration. Toutefois, dans les facultés d'éducation du Canada, des personnes tentent de remédier à la situation. Certains membres du corps professoral comprennent l'importance de fournir du leadership en éducation à l'environnement et au développement durable, souvent dans des circonstances où l'inertie institutionnelle et l'absence d'un public réceptif compliquent le travail. En nous inspirant de notre expérience au sein du corps professoral, nous avons entrepris des travaux de recherche concertée pour définir et analyser les pratiques de leadership qui, selon nous, facilitent le changement systémique des méthodes de planification et de mise en œuvre de l'éducation à l'environnement et au développement durable dans nos facultés d'éducation. En adoptant une approche de recherche concertée et en agissant en amis critiques, nous voulons affiner nos pratiques de leadership et maximiser notre capacité à accélérer les changements systémiques urgents et indispensables au développement durable. Résumé de notre expérience, la présente étude contribue à la recherche embryonnaire sur le leadership environnemental dans la formation des enseignants (Stevenson et al., 2014; Ferreira, Ryan et Davis, 2015; Erhabor, 2018).

Key-words: leadership, teacher education, environmental sustainability

Mots-clés : éducation à l'environnement et au développement durable, formation des enseignants, leadership, recherche concertée, Ontario

Introduction

Education is key to transforming how we live, moving us from activities destroying the Earth's life support systems to ones that ensure a sustainable future. Given the intensity of threats to life on Earth, preparing new teachers for work in Environmental and Sustainability Education (ESE) should be regarded as the prime mission of teacher education programs. That this is not currently the case is a source of frustration for many involved in teacher education. However, there are people in Canada's faculties of education working to address this situation. These faculty members embrace the need to provide leadership in ESE, often in circumstances where institutional inertia and lack of a receptive audience make the work difficult. As three such faculty, we have undertaken a collaborative action research study to identify and analyze the nature of our leadership practices that help to facilitate systemic change in how ESE is planned and implemented in our faculties of education. Adopting a collaborative action research approach and acting as critical-friends, we aimed to refine our leadership practices to maximize our capacity to facilitate urgently needed systemic changes towards sustainability. By sharing our experiences, this study aims to contribute to the emerging literature on environmental leadership in teacher education (Stevenson et al., 2014; Ferreira, Ryan & Davis, 2015; Erhabor, 2018).

Addressing the climate crisis should be prioritized in faculties of education and education at all levels. UNESCO's *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability* called on all countries to prioritize this work (Hopkins & McKeown, 2005). Several studies conducted since 2000 have called for greater attention to ESE and Education for Sustainable Development in preparing new teachers. The Council of Ministers of Education, Canada (CMEC) found some evidence of ESE in the school curricula of some provinces but recognized that it was virtually absent from preservice teacher education (Council of Ministers of Education, Canada [CMEC], 2000). Still, by 2012, CMEC found only modest progress in Canadian faculties of education, primarily resulting from the contributions of a few committed people, rather than as a consequence of institutional initiatives (CMEC, 2012). Yet the creation of a provincial policy framework in Ontario, *Acting Today, Shaping Tomorrow* (Ontario Ministry of Education [OME], 2009), did contribute to a heightened interest in ESE in faculties of education, evidenced by a range of new learning opportunities in ESE in preservice teacher education programs in Ontario in the years that followed its release (Inwood & Jagger, 2014, p. 78).

These developments, and more recent progress, largely stems from individual faculty members across the country collaborating, sharing experiences and pushing for pedagogic, programmatic and institutional changes (Karrow & DiGiuseppe, 2019). While it is traditional for institutions (and faculty) of higher education to regard each other as rivals in terms of funding and recruitment, we belong to a group of faculty who believe that the nature of the climate crisis demands that we collaborate to ensure that education embraces opportunities to counter the threat to life on our planet. We undertook this study against this background of passionate commitment from individual faculty members, pitted against institutional inertia.

Literature on Leadership in Sustainability

To better understand our experiences as leaders in ESE, but with limited research on ESE leadership in teacher education for guidance, we examined models of environmental leadership in the general sustainability research literature. Taylor (2012) conceptualized leadership "as a *process of influence* that occurs between leaders and their followers that involves establishing direction" (p.871). Shriberg & MacDonald (2013) noted that sustainability leadership is challenging because of the "wicked" nature of interrelated environmental and social issues, and that ESE requires "a leadership theory and practice suited to cross-boundary, systems-oriented thought and action" (n.p.). This is particularly applicable in teacher education institutions because "Preservice teacher education institutions have achieved notoriety for their tendency to be large and complex organizations that are difficult to change" (Ferreira et al., 2015, p.194).

A growing body of research addresses environmental leadership in general, although these theories are still developing (Andrews, 2012; Shriberg & MacDonald, 2013; Burns et al., 2015). Ideas and principles found in this work can help inform the work of teacher educators, but the limited number of published studies that relate directly to leadership in ESE within teacher education (Stevenson et al., 2014; Ferreira et al., 2015; Erhabor, 2018) point to the need for more work in this area.

For innovation to occur in ESE in teacher education, leadership will need to aim beyond mere fulfillment of assigned roles; it will need to be embedded in sustainability values and driven by personal motivation (Burns et al., 2015; Taylor, Cocklin, Broen & Wilson-Evered, 2011). Taylor (2012) notes that leaders in sustainability are often "champions of change" (p.871); they can emerge at any level within an organization and do not need to be in senior positions. Emergent leaders need to be ready to cross boundaries and create system-level changes beyond their immediate sphere of influence. Since the nature of changes that sustainability demands are system-wide and profound, Bass and Steidlmeier (1999) argue that a model of "transformational leadership" is required to help shift entire organizations toward a "higher ethical purpose" (p.181).

Taylor et al. (2011) proposed an emergent, champion-driven leadership model with initiation, endorsement, and implementation phases. The initiation phase sees an emerging sustainability champion, driven by personal values, seeking to instigate change within their existing sphere of influence. In the second phase, a champion seeks endorsement from decision-makers to help build "advocacy coalitions" (p. 421) and harness colleagues' knowledge, positions of power, and strategic networks to promote change. The implementation phase occurs when champions draw together teams from within and beyond their organizational boundaries to innovate and solve problems. These phases rang true for our team; each of us had been through these stages at different times in our ESE leadership.

The literature also identifies traits characterizing emergent sustainability leaders (Erhabor, 2018; Taylor et al., 2011). These include abilities to self-study, influence others, help others want to achieve high goals, and instill solid philosophical beliefs about the environment based on scientific knowledge. Erhabor believes that leaders who foster environmental education and actualize its goals have comprehensive knowledge, a critical perspective and a solid ethical sense towards our environment. Taylor et al. define champion-driven leadership as a process that occurs within the context of relationships between leaders and their followers: establishing direction and vision, generating motivation, and providing inspiration. With these as broader goals for developing leadership capacities, we began examining our practices individually and collaboratively.

Methods of this Collaborative Action Research Study

Methodological Framework

To better understand and learn from our experiences as emergent leaders in ESE in teacher education, we utilized collaborative action research (CAR), which enabled us to concurrently deepen our understanding of the theoretical models of sustainability leadership while enacting aspects of it in our faculties. Action research positions knowledge and theory as inseparable (McNiff and Whitehead, 2002), as it involves 'learning-by-doing, collaboration, innovation, active and participatory learning' (Cebrián et al., 2015, p.717) and dialogue (Sterling, 2004). We also employed Morrison's (2018) critical-friends group (CFG) model in our approach to CAR, hoping it would assist us in our grassroots work in ESE in higher education, allowing us to compare experiences and to reflect on these with others working as emergent leaders in ESE, and gain insights from knowledgeable and supportive colleagues.

Research Questions

The central research question was: What leadership practices help facilitate systemic change in ESE in our faculties of education? In this exploration, we identified three sub-questions:

i. What have we done to take leadership in ESE in our faculties in the past?
ii. What leadership practices are we currently implementing (with colleagues, students, administrators and the wider community)?
iii. Can CAR help us better understand and leverage our leadership practices in ESE to facilitate change in our faculties?

Data Collection, Analysis and Interpretation

Eight CFG conversations were held from 2019 to 2020 to share experiences and plans, analyze relevant literature, and identify subsequent actions. These were recorded, transcribed, and coded; thematic analysis helped identify emerging patterns in the data, which were compared with sustainability leadership descriptions in the literature. We kept journals that included key documents to reflect on our leadership experiences, considering interactions with colleagues and students, strategies employed, and attempts to instigate change within and beyond our institutions. As is characteristic of action research, there was a fluidity between the iterative cycles of data analysis, interpretation, theorizing and action, helping to deepen our understanding of leadership praxis and informing our leadership practices synergistically.

Limitations

The scope of this study is specific to experiences in three Canadian universities. We aimed more for meaning-making in this qualitative study rather than generalizability for our findings. Knowing each other well may have brought bias and pre-existing assumptions into our analytical discussions, but it also helped facilitate rich conversations in which we felt comfortable sharing our challenges, disappointments, and successes, increasing the relevance of this research to our praxis.

Context

Promoting ESE in Teacher Education at three Ontario Institutions

Paul Elliott, School of Education and Professional Learning, Trent University, Peterborough, Ontario

Trent University recruits graduates to its consecutive Bachelor of Education (B.Ed.) and Indigenous B.Ed. programs, with students entering a Primary/Junior or Intermediate/Secondary stream. In addition, the School offers a

Masters of Education program. Some of the work described here resulted from a collaboration with Jacob Rodenburg, Executive Director of Camp Kawartha.

I moved to Trent University from a university in the UK at the midpoint of my career in teacher education. I joined the School of Education as one of the most experienced members of faculty in a relatively new department. As a member of a small team, I have been called on to teach a number of courses in the B.Ed. program, but have always taught the Intermediate/Senior Biology Curriculum course and was co-creator of a core course in Environmental and Sustainability Education and Indigenous Education.

For over a decade, I have worked to increase ESE content and philosophy in the B.Ed. program at Trent University. Progress has been erratic. It has not always been apparent that I am providing leadership, but when I reflect on what has changed over time, I recognize it as such. My motivation has been influenced by specific authors and colleagues I have worked with. Orr's work (e.g. 1991) helped validate my desire for change in the education system, giving me the courage to persuade others of the need for change. Kimmerer's work (2003, 2013) helped me to reconcile my scientist self-identity with the Indigenous teachings from which, as a newcomer to Turtle Island (North America), I have made efforts to learn and to understand. O'Brien's (2013, 2016) work on Sustainable Happiness revealed the possibilities inherent in helping people appreciate the benefits, to themselves as well as the planet, of adopting an eco-centric mindset.

This action research prompted reflection at a moment when a formal leadership opportunity presented itself—becoming coordinator of the B.Ed. Program brought the chance to set agendas prioritizing the re-evaluation of our program through the lens of sustainability.

Teacher education is often dominated by externally mandated priorities and inertia in the school system, making it difficult to persuade colleagues to address sustainability. Collaborating with colleagues in other institutions stimulates exchanging ideas, sharing leadership tactics, celebrating successes, and nurturing a sense of community. Like many colleagues at other institutions, much of the work I have done has, by necessity, been in the margins of the B.Ed. Program.

The Ontario Ministry of Education's 2009 environmental education policy document provided the opportunity to engage colleagues in a discussion about ESE content in the B.Ed. program (OME, 2009). I proposed and chaired a departmental working group to plan our response. The intensive nature of the B.Ed. Program, timetabling logistics, and a lack of awareness from many colleagues meant practical suggestions had to involve working in the margins. My dean agreed we should start small, implementing a suite of optional workshops as an easy and effective way to align with the policy. Since 2010 the extracurricular Saturday workshops for B.Ed. teacher candidates have run throughout the year and have attracted many participants. They avoid the limitations of the Monday-Friday timetable, side-step the university's course approval process and negate work-load issues since we volunteer our time.

Other teacher educators quickly realized this direct-action model resolved many of their frustrations, and so we saw similar programs launched by several other institutions in our province.

OME's decision in 2016 to extend B.Ed. programs from one year to two years duration presented new opportunities. I led the call for a new ESE component in our program and secured a core course combining this with Indigenous education, another area that had previously been underrepresented. Fortunately, the two topics are intertwined and complementary. The work that I had already done on the margins of the B.Ed. program demonstrated the appetite for ESE work among teacher candidates and was critical in helping secure space for a core course in the revised programming.

The present study prompted me to assess my achievements, how I overcome barriers by seeking practical solutions within the constraints of an existing curriculum, what I still hope to achieve, and how I might best go about this. Lupinacci (2017) captures aspects of my philosophy, writing about leaders needing to pivot away from a traditional egotistical leadership model to one that is "ecotistical" (p.21). Egotistical leadership assumes an anthropocentric mindset with a hierarchical relationship between humans and nature. Lupinacci points out that it is also associated with other superior/inferior dualisms such as man/woman, wealthy/poor, white/person of colour, all of which may have greater resonance with some colleagues in teacher education and thereby offer openings for conversations about sustainability. I have long held an eco-centric worldview, but only over the last decade have I introduced the concept to my students and aligned my leadership with it. As a tenured professor, the security that I enjoy has given me the confidence to do this, but I am also driven by my growing anxiety about the future of life on earth and my desire to help the young develop an ecotistical mindset. I feel now that my leadership is authentic because I am being true to who I am.

Hilary Inwood, Ontario Institute for Studies in Education (OISE), University of Toronto, Toronto, Ontario

When I began to work on ESE at OISE in 2009, I was not a logical choice to become an "emerging environmental champion" (Taylor, 2012) as I was not a recognized expert in ESE, nor in a leadership position in our preservice teacher education programs. As a white, cisgendered settler I had been teaching visual arts education courses at OISE since 2002, but had only recently completed my doctorate (investigating the intersections between environmental learning and arts education). My expertise in the arts differed from the background in science education of many environmental educators in faculties of education. However, with the release of the provincial policy framework in Environmental Education (OME, 2009), an opportunity to better embed ESE across OISE's preservice programs presented itself. As a faculty member in one of the largest preservice teacher education programs in Canada, OISE offered the possibility

of introducing ESE to about 2000 teacher candidates each year in its consecutive and concurrent B.Ed programs, Master of Teaching program, and Master of Child Study programs (all of which offered teaching credentials).

Working with a growing understanding of OISE as an organization and support from key members of the teacher education leadership team, I have collaborated with colleagues and students to establish ESE as a priority at OISE over the last decade, resulting most recently in the launch of our inaugural Sustainability and Climate Action Plan (Ontario Institute for Studies in Education, 2021). With limited literature available on leadership in ESE in teacher education and few models to follow, my approach to leadership (and my confidence) grew organically over time. At the outset, I began integrating ESE into my own courses in visual arts education, designing an elective course in ESE, organizing extracurricular workshops, and forming an ESE Working Group with colleagues and students. Asking for support from program leaders resulted in course release and access to student assistants, allowing the Working Group to support ESE course infusion, organize field trips and student clubs, and offer an annual ESE conference and EcoFair. It also aided in creating a Community Learning Garden (Jagger et al, 2016), a community-created environmental art collection (Inwood & Kennedy, 2020a), and a digital resource hub (https://www.oise.utoronto.ca/home/scan). Over time, collaborating with others not only helped to develop my leadership skills, but also grew ESE across the institution, building connections with faculty who had expertise in Indigenous education, and equity and anti-discriminatory education. Other collaborations with the Toronto District School Board and NGOs led to innovative internships, service-learning placements and inservice teacher education programs (Inwood & Kennedy, 2020b). Learning how to design and deliver year-round professional learning (combining the flexibility of co-curricular learning with the depth of course-based learning) has been key to ensuring multiple entry points into ESE for TDSB teachers and OISE students. It has also demonstrated to me the many benefits of integrating preservice and inservice teacher education in ESE through combining the expertise and resources of faculties of education with K-12 school boards.

There is no doubt that my leadership experiences and skills have grown throughout these experiences, and that I have learned from and with knowledgeable colleagues, dedicated students, and supportive program managers. Finding a like-minded set of colleagues from other faculties of education also furthered my thinking and led to the establishment of a national network for teacher educators focused on ESE in 2017 (http://eseinfacultiesofed.ca). Working with critical friends in the current study has helped me better understand how my leadership capacity in ESE has grown over the last decade. I didn't realize that I was demonstrating some of the principles of sustainability leaders from the outset, as defined by Ferdig (2009); I took responsibility for making ESE relevant to others and sustained momentum through constructive conversations and

authentic relationships. I also drew on the iterative principles of action research by reflecting on and facilitating emerging outcomes, learning to work with paradox and ambiguity. With help from colleagues and students, I have experienced the three phases of champion-driven leadership (Taylor, 2010), from initiating ESE as a new project (initiation) to building coalitions of support (endorsement), and most recently, beginning an implementation phase that aims to institutionalize ESE, sustainability and climate action across OISE and the University of Toronto. Throughout this study, reflective journaling, literature reviews, and critical discussions have led me to wonder if I could have been a more effective leader had I known more about sustainability leadership when I began this work. I also acknowledge that I have been developing my leadership skills while helping my students and TDSB teachers develop theirs. It is rewarding to see those I have mentored stepping into leadership positions in schools and NGOs, beginning their journeys to becoming "emergent environmental champions" in their own right (Taylor, 2012.)

Yovita Gwekwerere, School of Education Laurentian University, Sudbury, Ontario

Laurentian University offers a five-year Concurrent Bachelor of Education degree program, with students entering the Junior/Intermediate teaching stream. Compared to other teacher education programs across Ontario, we have a small program, graduating approximately 100 students yearly. With a small full-time faculty complement, sessional instructors teach most courses, creating challenges in developing new courses. As the only science educator in the School of Education at Laurentian University, I automatically became the ESE go-to person for reviewing a draft of the provincial policy framework on environmental education (OME, 2009). Although the school was not required to address the new policy framework, I was moved to act by personal sustainability values (Burns et al., 2015), coupled with a broad environmental understanding and a robust ethical sense towards our environment (Erhabor, 2018). My environmental sustainability journey dates back to the late 1990s when I came across articles on climate change, and I integrated the readings into the ecology course I was teaching. Twenty years later, the new policy on environmental education provided opportunities for integrating ESE into the science pedagogy courses, researching the understanding of ESE among preservice teachers and hosting lunchtime workshops for preservice teachers to introduce the EE policy framework. I contacted colleagues within my program to collaborate on projects where students integrated the environment in Science, Music, and Literacy. In 2010, I facilitated the launch of an Outdoor and Environmental Education club by B.Ed. Students. These events legitimized the beginnings of my emergence as an ESE leader. During this initial phase as an emergent leader (Taylor et al., 2011), I worked on the margins, integrating ESE into preservice teacher education in areas within my control.

The endorsement of ESE as a requirement in our five-year preservice program has been challenging due to the programming limitations of our small program, but I have persevered. The ESE work on the margins "tilled the soil" and helped launch action when opportunities arose. The opening of a new School of the Environment (SOTE) in 2014 at our university allowed the adoption of new strategies and tactics to navigate institutional structures (Kezar et al., 2011). A cross-appointment to the SOTE provided opportunities to collaborate on environmental sustainability research and teaching. I designed an elective ESE course for Education majors and non-majors. Although not a required course, the enrollment of Concurrent Education students in the elective ESE course increased over time. The course utilized transformational learning strategies that emphasized experience, critical reflection, dialogue, collaboration and taking action (Taylor, 2008) and fostered leadership by helping students see themselves as transformational leaders who could enact change and influence others (Burns et al., 2015). Ideas from environmental educators who advocate for integrating participation in the education curriculum (Cutter-Mackenzie, 2010; Youniss & Levine, 2009; Orr, 2004) and ESE colleagues supporting Eco mentoring projects helped shape these course experiences. The process of implementing ESE in teacher education through the SOTE program has been similar to what Kezar et al. (2011) and Meyerson (2003) call "tempered grassroots leadership". According to Meyerson (2003), "tempered leadership tends to be less visible, less coordinated, less vested with formal authority, more opportunistic and more humble" (p. 171). Meyerson (2003) adopted the grassroots leadership concept from social movements, and views grassroots leaders on campus as the organization's conscience, often bringing up ethical and societal issues such as climate change.

Working with the CFG model allowed me to reflect on and learn about my ESE leadership style. I possess the qualities of sustainability leadership rooted in understanding the connectedness of systems and values that lead to addressing complex sustainability challenges in an inclusive, collaborative and reflective way (Burns et al., 2015). I possess emergent sustainability leadership traits (Erhabor, 2018; Taylor et al., 2011) that include abilities to self-study, influence others, and instill solid philosophical beliefs about the environment based on scientific knowledge. I have continued to expand my circle of influence by creating partnerships with other emergent leaders at local, national and international levels. Collaborative work with emergent ESE leaders across Canada resulted in a co-published book on ESE in Canadian teacher education (Karrow & Giuseppe, 2019). Together we became founding members of a national network of emerging ESE leaders advocating for system-wide integration of ESE in preservice and in-service teacher education. Additionally, I understand that the complexity of sustainability problems such as climate change presents adaptive challenges within multiple systems (Parks, 2005), requiring a global perspective. While I have initiated and implemented ESE in teacher education

from the margins, working with a CFG has enriched my understanding that emergent leaders drive change by involving other leaders (Taylor et al., 2011) and has provided opportunities for growth as an emerging ESE champion in teacher education.

Findings and Discussion

This section discusses the themes that emerged from the data to address our questions about the types of leadership experiences we have used to deepen ESE in our faculties of education and CAR's usefulness in this process.

Understanding past leadership experiences

Our initial experiences leading ESE in our faculties were similar; we had no role models and did not intentionally seek out ESE leadership. Instead, we were motivated by our environmental values and deeply-held beliefs that all levels of education must contribute to creating a sustainable future. Burns et al. (2015) describe sustainability leadership as being embedded in sustainability values and driven by personal motivation, rather than aimed at simply fulfilling an assigned role (Taylor et al., 2011). Our shared area of expertise being preservice teacher education, we recognized this as an arena well-positioned to influence the next generation of teachers regarding the importance of ESE in K-12 learning contexts.

We started modestly leading ESE learning in our programs by embedding ESE in our courses and organizing extracurricular workshops. This demonstrated our commitment without requiring formal permission. As Paul noted in one of the transcribed CFG conversations analyzed for this study, "we weren't proposing a new course, we weren't promoting anything that had to be approved by the university committee system, we weren't proposing anything obligatory, and we weren't looking for any personal recompense for doing it." As student attendance at ESE opportunities grew, we became bolder and sought other ways to bring ESE into the conversation, both in the margins and in the centre of our programs through meetings, working groups, courses and extracurricular events. Being consistent (and persistent) voices for ESE was critical in being positioned as grassroots leaders (Kezar et al., 2011; Meyerson, 2003).

Collaboration with colleagues and students was central to our leadership roles. We sought others who shared our concerns about climate change and interest in sustainability and found ways to connect these to their passions. Paul reflected that "you never know who's going to be a friend or who's going to come along to champion your big idea. You don't necessarily have to be the person who makes the big idea happen, but if you put it out there, someone else might." Paul's early connection to an educator at a local environmental education centre supported the development of Trent's Eco-Mentor Program,

and building relationships with Indigenous scholars was fundamental to getting an ESE and Indigenous Education core course into their B.Ed. Program. At OISE, Hilary helping to establish an ESE Working Group proved critical, as did making connections at the local school board and not-for-profit organizations, helping bring expertise to expand programming. For Yovita, embedding ESE into her courses led her to join committees to locate others interested in advancing ESE in other parts of her university. Through these experiences, we exhibited traits identified in the literature as characteristic of emergent sustainability leaders (Erhabor, 2018; Taylor et al., 2011). We began to understand better the power of building relationships as part of a systems approach to growing ESE leadership. We recognized that getting others engaged, inside and outside of our programs, was necessary for building momentum, as was taking every opportunity to embed ESE into preservice teacher education, given the complexity of our programs.

Identifying current leadership practices

We became increasingly aware that in the early years of our leadership in ESE in preservice teacher education, we learned through trial and error, and by addressing challenges as they arose. We only became aware of how these strategies exemplified recommended leadership practices as our study advanced; what follows is a summary of some of the leadership practices we enacted.

Leading with place in mind

While faculties of education have some common features, each is distinct in its structure, function, power dynamics, internal faculty and general university regulations. Understanding these is central to instigating change and exercising successful leadership. During the initiation phase (Taylor, 2011), Yovita and Hilary began by working in the margins of their institutions, finding places to establish roots for ESE where possible, even if modestly in the early years. Working in a smaller university, Paul was able to step into a variety of B.Ed. Program leadership roles over time, which helped him to understand potential ways to embed ESE. He spoke of "embracing leadership roles" as they arose: "I didn't see this coming, but when it came, I thought, 'that's a great chance to do this.'" The three of us were driven by personal values, seeking to instigate change within our existing sphere of influence (Taylor, 2011).

Starting small, doing it well

Initially instigating change within our spheres of influence, we were able to model change without causing anxiety for our colleagues. Yovita noted the hesitation that she felt from her colleagues: "We are living in a culture where you don't feel like you have enough knowledge [about climate change] or you don't feel like you can teach others, but anyone can teach it [ESE]." We grew

to understand that we were following the traditional advice to environmental educators: starting small to gain support for ESE, and demonstrating that the work can be done well to build trust before scaling up. Small steps were not what we desired, but they accumulated over time and led to strengthened relationships, community-building, and a growing impact in our institutions.

Balance patience with action

Instigating change can be a daunting prospect when faced with institutional inertia, lack of understanding and, in some cases, active resistance. This can be demoralizing when seeking urgently needed changes, such as preparing teachers to facilitate learning in a climate crisis. Leadership requires patience, but this needs to be balanced with strategic action. Small successes accumulate and gradually prepare the ground for more fundamental shifts by demonstrating need and helping to recruit allies. Hilary reflected on this when discussing the importance of asking for support from B.Ed. Program leaders: "I've rarely had anybody say 'no'. Maybe they don't give you exactly what you asked for, sometimes they give you something different, but if you can make that work, often that builds a bit of a history with that particular person… then when you come back a second time to ask, they say, 'well you made that first thing work, so let's try the second thing this time'." Hilary demonstrated characteristics of what Taylor (2011) described as a champion, someone who seeks endorsement from decision-makers to help build "advocacy coalitions" (p. 421), aiming to engage those in positions of power and strategic networks to promote change.

Creativity is key

On encountering obstacles, our leadership strategy drew on lateral thinking and creativity to identify alternative approaches and opportunities; bypassing the need for approval and side-stepping institutional bureaucracy offered the quickest and easiest routes to change. This "low-hanging fruit" was often a good way to maintain momentum for change and benefit from the positive emotions associated with achievement. Paul cited an example of this at Trent: "The Eco-Mentor Program did two things. One, it showed that there was a demand for that sort of thing, and two… it got some of the most positive feedback of the whole [B.Ed.] program. Those two things combined really helped us claim the space for the new core course [in ESE and Indigenous Education]." We often discussed that we should not shy away from creative thinking on a large scale as the need for change is urgent. Hilary cited the example of how "dreaming big" about a Climate Summit at OISE was realized towards the end of the study; she could never have imagined this happening in the early years of her ESE leadership. This form of grassroots leadership on campus is described by Meyerson (2003) as an organization's conscience, often bringing up ethical issues in society such as climate change.

Scale change up and out

Engaging in leadership at various scales simultaneously proves to be an effective strategy. Working within one's institution and beyond offered us the prospect of advances on multiple fronts. It was not always possible to predict where gains would most easily be made; sometimes, gaining in one area would help to stimulate change elsewhere. Working beyond one's institution helped in other ways, too, as Hilary put it: "the more that we can get people involved in leadership in the work that we do, it reduces the load on us individually, helps to show that there is a broader base, and helps people to feel connected" to ESE in our institutions. Paul concurred, noting that this can be an effective leadership strategy: "stirring up the masses makes the person in charge more likely to say yes." This aligns with Taylor's (2012) conceptualization of leadership "as a *process of influence* that occurs between leaders and their followers that involves establishing direction" (p.871).

Empower others

Finally, it became clear that building relationships, sharing ideas, and collaborating helps to empower others in addressing the climate crisis. Hilary spoke of this as an emerging leader: "I'm not going to be director of the B.Ed. Program, but I can help other people see some bigger, wider ideas that we need to be working on, and I can work on harnessing their energy." This highlighted how others contribute to change, from students advocating for embedding ESE into courses to faculty collaborating on extracurricular learning. Highlighting what others have contributed to ESE helps demonstrate that the sought changes are neither unreasonable nor unusual. These leadership qualities align with Taylor's (2012) understanding, describing emergent leaders as ready to cross boundaries and create system-level changes beyond their immediate sphere of influence.

Using Collaborative Action Research to understand ESE Leadership

Our third sub-question for this study queried whether a CAR approach would help us better understand our experiences as emerging leaders of ESE. While we did not have prior knowledge of leadership theory in ESE, we often adopted and modeled the strategies that we later found in the published literature. Taking time to reflect on our experiences and connect these to existing models of emergent leadership (Taylor, 2012), ecotistical leadership (Lupinacci, 2017), and tempered grassroots leadership (Kezar et al., 2011) helped us understand our leadership practices better, refine them over time and share them with others. The CFG model (Morrison, 2018) provides a safe space to reflect, motivate and learn. Some profound insights include Yovita's reflection on how the tempered grassroots leadership style (Kezar et al., 2011) that enabled her to overcome bureaucratic challenges can be ramped up by challenging the status quo. She benefited from Hilary's scaled-up practices to become an emerging

champion (Taylor, 2012) by “brokering information, challenging the status quo and suggesting new ideas.” Hilary unwittingly quickly slipped into the role of being an agent of sustainability (Taylor, 2012, p. 8). Paul’s ecostical leadership (Lupinacci, 2017), guided by his ecocentric views, provides hope for realizing possibilities and developing ESE leadership that stems from the authentic self.

The key findings show that using CAR, integrated with the CFG model, provides insight into the leadership practices we have enacted in our faculties of education as emergent leaders, building momentum from the bottom-up (Taylor, 2012). Our leadership practices started small, motivated by ecocentric values (Lupinacci, 2017) while working in the margins of our institutions to establish the roots of ESE, thus demonstrating a form of “tempered leadership” (Meyerson, 2003) that balanced patience with actions, persistence and creativity. As we faced obstacles, we sought creative solutions that led to “transformational leadership” (Bass & Steidlmeier, 1999) and helped shift entire organizations, scaling change up and out as we empowered others. For example, the Eco-mentor program showed the demand for ESE and helped create space for ESE as a core course at Trent University, and dreaming big led to a successful climate summit at OISE. However, some key questions also arise regarding whether we should be trying to lead from within the system, or working to change the system and promote systemic change.

Conclusion

In this study, we used collaborative action research and a critical-friends model (Morrison, 2018) to reflect on our practices and identify the nature of leadership that facilitates systemic change in teacher education. We identified some key challenges ESE leaders face in teacher education, such as finding room for ESE courses in programs, gaining administrative support, and lacking ESE knowledge among colleagues. We have summarized some of the leadership strategies we used to transcend these challenges, which form the basis for the recommendations we give to others beginning this work: starting small and doing it well, leading with place in mind, balancing patience with action, being creative, scaling change up and out, empowering others and collaborating with like-minded colleagues within and across institutions. Unlike other leadership forms that are top-down in nature, emergent ESE leaders are champions who drive change from the bottom-up, motivated by personal sustainability values, adopting an ecotistical mindset (Lupinacci, 2017) and learning how to navigate institutional structures. Further research involving more ESE educators is needed to understand the diversity of ESE leadership strategies and how leadership in teacher education, ESE, and climate action differs from other sustainability leadership forms. Research needs to also focus on developing leadership capacities in our students, as they will be leading ESE in schools and faculties of education in the future.

Given the nature of collaboration on this study and the writing of this article, the authors share authorship of this text equally. They also declare that there is no conflict of interest in conducting this study and writing this article.

Notes on Contributors

Paul Elliott is an emeritus professor in the School of Education at Trent University in Peterborough, Ontario where he taught a range of courses including science education and environmental and sustainability education. His research interests have been wide-ranging including insect and bat ecology and various aspects of science education. In recent years his research, curriculum development and advocacy have focused on environmental and sustainability education in teacher education. He co-founded an organization to promote this work (eseinfacultiesofed.ca).

Yovita Gwekwerere is an Associate Professor of Science and Environmental Education in the Faculty of Education at Laurentian University in Ontario, Canada. She teaches Science and Environmental Education courses at the Junior-Intermediate level. Her research interests include STEM inquiry; integrating environmental and sustainability education in Teacher Education; and equity, diversity and inclusion in science education. Her most recent publications explore the use of pedagogy inspired by Ubuntu Philosophy to inspire Sustainability thinking and Climate action among youth in Southern Africa. Yovita has collaborated on several projects including one of the largest international studies on Student Views on Science Inquiry.

Hilary Inwood is a teacher educator, researcher, and artist who leads the Sustainability & Climate Action Network at the Ontario Institute for Studies in Education at the University of Toronto, and teaches a range of graduate courses. She coordinates a large-scale collaboration between OISE and the Toronto District School Board focused on teachers' professional learning in ESE. She is a co-founder of a Canadian national network that aims to better embed ESE into teacher education, and co-leads a new national project on Climate Change Education.Her research focuses on deepening teachers' knowledge and skills in environmental learning as well as on developing creative approaches to ESE in educational settings.

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“Invasive” Species Discourse in Ontario Elementary and Secondary Curricula: A Critical and Decolonial Analysis

Marleine Gélineau, Constance Russell, & Lisa Korteweg, Lakehead University, Canada

Abstract
“Invasive” species are generally viewed with contempt. Yet many Indigenous peoples have more nuanced approaches to newcomer species informed by kinship relations, and some ecologists suggest that ecosystems have always been dynamic and these species occasionally play beneficial roles in their new homes. A critical and decolonial discourse analysis of nine Ontario elementary and secondary curriculum documents revealed that when “invasive” species were mentioned, anthropocentric and settler-colonial logics dominated and Indigenous perspectives were ignored. Decolonizing the Ontario curriculum could offer more complex, humane, and reparative perspectives on newcomer species, especially important as Canadians grapple with climate change and Truth and Reconciliation.

Résumé
Les espèces « envahissantes » ne sont généralement pas très bien vues. Pourtant, de nombreux peuples autochtones portent sur les espèces non indigènes un regard plus nuancé, inspiré des concepts de « relations d’affinité »; en outre, certains écologistes suggèrent que, parfois, la nature dynamique des écosystèmes permet à ce type d’espèces de jouer un rôle bénéfique dans leur nouvel habitat. Une analyse du discours, critique et décolonialisée, de neuf programmes scolaires d’écoles primaires et secondaires de l’Ontario révèle que, lorsqu’il est question des espèces « envahissantes », la logique coloniale anthropocentrique domine, et que la perspective autochtone est ignorée. La décolonisation du programme scolaire de l’Ontario permettrait de faire place à des points de vue plus nuancés, bienveillants et réparateurs sur les espèces non indigènes, des approches particulièrement importantes au Canada dans le contexte actuel des changements climatiques et des démarches de vérité et de réconciliation.

Keywords: invasive species, curriculum, discourse analysis, anthropocentrism, Indigenous knowledge systems, decolonial pedagogies, environmental education

Mots-clés : espèces envahissantes, programme scolaire, analyse du discours, anthropocentrisme, systèmes de connaissances autochtones, approches pédagogiques décolonisées, éducation à l’environnement

Introduction

The subject of "invasive" species regularly makes Canadian news, with at least nine items posted on the CBC website alone in the first three months of 2023. From "super pigs" (CBC, 2023a) to "sea vomit" (CBC, 2023b), most reporting focused on the problems these critters cause as well as the funding allocated to eradicating them (e.g., CBC, 2023c). Typically, media discourse around "invasive" species is fraught with sensationalism, inconsistencies, and misconceptions (Maggiulli, 2022). According to the Canadian non-profit, Invasive Species Centre (2022a), "invasive" species are organisms who have been introduced to a new ecosystem—either accidentally or intentionally—and been deemed harmful to human or ecological health or to cause economic damage. Some organizations extend this definition to include organisms who have the *potential* to cause harm, even when the impacts of the newcomer species[1] are not fully understood (United States Department of the Interior, n.d.).

One common method used to distinguish long-established "native" species from more recently introduced "non-native" species is to separate them in relation to colonial timelines (Reo & Ogden, 2018), despite the arbitrariness of using European settlement to demarcate species (Van Dooren, 2011). While newcomer species are typically viewed with contempt, many Indigenous communities and ecologists recognize the dynamic nature of ecosystems and the "services" that some newcomer species may provide (Reo et al., 2017; Reo & Ogden, 2018) hence we have chosen to put "invasive" in quotation marks to signal how contested the term and rhetoric remains.

Earth is full of dynamic systems, and organisms have migrated from their place of origin for as long as life has existed on our planet. Of those species introduced into a new habitat, approximately 10% survive its environmental conditions, and only 10% of this subset (or 1% of the total) actually cause harm (United States Environmental Protection Agency, n.d.). Instead, most newcomer species who can adapt to their new habitat will become a neutral or important component of the local food web and integrated into local culture (e.g., dandelions on Canadian lawns, salmon in the Great Lakes). These species are then referred to as "naturalized," echoing language used to describe the process of humans gaining citizenship in Canada (Statistics Canada, 2022).

Newcomer species are most often found in landscapes that have been disturbed by natural events or human activity (Pearce, 2015), including human migration associated with colonialism and settler colonialism. Spaces that have been transformed through deforestation, agriculture, urbanization, and pollution disrupt local ecosystems and populations, creating openings for newcomers (Scott, 2010). Climate change also impacts species distribution; the increase in forest fires, flooding, tornadoes, hurricanes, and droughts places pressure on long-established species and the warming of land and water habitats can encourage cold-loving and warmth-loving species to shift to more suitable habitats (Finch et al., 2021).

As newly introduced species often appear when long-established species are in decline, the newcomers are often misrepresented as causing that decline. Thus "invasive" species (e.g., phragmites, water hyacinth) are frequently blamed for the extinction of other species when environmental degradation, rampant extractivism, and overharvesting are root causes (Pearce, 2015; Scott, 2010). While some introduced species are undeniably harmful to other species and ecosystems, Mark Davis et al. (2011) and Matthew Chew (2015) suggest that to claim that "alien" species pose as substantial a threat to biodiversity as habitat loss is inadequately substantiated. Some ecologists also have come to believe that, on occasion, newcomer species can promote biodiversity by increasing hybridization and speciation, with both newcomer and "native" species adapting to a changing environment (Davis et al., 2022; Schlaepfer, 2018).

What is telling is how those newcomer species who cause more immediate economic damage are those first targeted for eradication rather than those who threaten ecological or human health (Invasive Species Centre, 2022b), redolent of the resourcism and extractivism inherent in settler colonialism (Willow, 2016). "Invasive" animals are baited, trapped, gassed, poisoned, or deliberately infected with lethal viruses (Pearce, 2015; Seymour, 2013), arguably practices that would be less tolerated by the public if the animals were "native" or domesticated (Van Dooren, 2011). Introduced species often are described as killers who are "butchering," "choking," "slaughtering," "smothering," and "suffocating" members of their new communities (Larson et al., 2005). Eradicating "invasive" species, then, is sometimes portrayed as patriotic (Pearce, 2015; Ram, 2019), and colonial, xenophobic, and militaristic metaphors abound in writing about "invasive" species (Druschke et al., 2016; Larson et al., 2005; Subramaniam, 2001).

In contrast to dominant Western onto-epistemologies that cast species as being "in" or "out" of place (Van Dooren, 2011), many Indigenous knowledge systems view "invasive" species as belonging in their new homes (Bach & Larson, 2017), emphasize co-relationality with other life as central to Land kinship (Lees & Bang, 2023), and suggest that all beings need to be respected, considered teachers, and cherished for their respective gifts (Kimmerer, 2015). Drawing on Land-based wisdom practices, such as those of Anishinaabe *aki*, ecosystems are viewed as dynamic and the arrival of new species into an ecosystem is considered a natural form of migration. As Nicholas Reo and Laura Ogden (2018) state, "Being new to an area, human-introduced, or even leading to environmental change does not make an animal or plant unwelcome or inherently bad" (p. 1448). Indigenous knowledge systems suggest that one should look for ways to develop relationships with these new relatives (Bang et al., 2014). For example, plantain (commonly known as "White Man's Footprint" in North America) is used to treat various ailments; as Robin Wall Kimmerer (2015) observes, "It's a foreigner, an immigrant, but after five hundred years of living as a good neighbor, people forget that kind of thing" (p. 214).

Indigenous communities do recognize the threat certain "invasive" species present and will use various techniques to manage them as needed (Reo & Ogden, 2018). For example, the Malanbarra Yidinji clan in Queensland, Australia traditionally use plants as poisons to selectively control two populations of tilapia fish severely impacting long-established fish species (Gratani et al., 2011). In North America, hand-pulling is by far the most common method employed by First Nations to remove "invasive" plants, and mowing, chemical treatments, fire, hunting, and grazing are also used as strategies to manage newcomer species (Reo et al., 2017). Indigenous communities also actively educate members about "invasive" species, share prevention strategies, save threatened seeds, transplant threatened species, and document traditional knowledges regarding "native" species (Reo et al., 2017; Willow, 2011). Contrary to how government funding is allocated mostly to managing those "invasive" species perceived as having a detrimental economic impact, Reo et al. (2017) suggest that Indigenous communities are primarily concerned about decreased access to traditional foods, medicines, or building materials.

Clearly, Western and Indigenous perspectives on newcomer species can differ significantly. These diverse perspectives are reflected in environmental education scholarship as well. While far more research in environmental education approaches "invasive" species uncritically (Maggiulli, 2022), recently there has been more problematization in the field. Katrina Maggiulli, for example, observes how dominant discourse "maps onto xenophobic anti-immigrant ideology such that these fear tropes work to reinforce one another" (p. 1394). Similarly, Joe Henderson and Stephanie Morningstar (2022), in their discussion of the rise of eco-fascism, note how "invasive" species rhetoric resonates with racist anti-immigration, purity, and eugenics rhetoric. Discussing formative influences on his relationship with the more-than-human world, Taiji Nelson (in Hecht & Nelson, 2022), shared, "It's hard for me to not draw immediate comparisons between discussion of invasive species and the discrimination I've experienced as an Asian American. I feel a complicated but protective kindship with beings that are labeled 'invasive' or 'unnatural'" (p. 1368). Offering an alternative discourse for environmental educators, Dax Ovid and Fortunate Mafeta Phaka (2022) discuss the journey of the Idwi (African clawed frog), now considered "invasive" in the United States, offering counternarratives informed by decolonial and postcolonial theories, Indigenous knowledges, and critical race theory. Similarly, Megan Bang et al. (2014) discuss how their pedagogical work with buckthorn and other plants "forcibly migrated" to Chicago encouraged them to reflect on the impact of settler colonialism on their "plant relatives" and to engage in a "form of critical border thinking [where] we began referring to these plants formerly named 'invasive species' to 'plants that people lost their relationships with'" (p. 47).

Particularly relevant to our study are recent analyses of school curricula, programming, and learning materials. In New Zealand, Michael Morris (2022)

analyzed educational resources published or approved by the government and found these "encourage children to kill non-native mammals, show them how to set traps, and emphasise to teachers how they need to impress on children the importance of eradicating 'pests'" (p. 174). Sally Birdsall and Tim Kelly (2022) reviewed the values mandated in the English-language New Zealand curriculum, concluding that students learning about and, even participating in, killing "invasive" predators is educationally and ethically appropriate in that context. Rajesh Ram (2019), Lauren Willing (2022), and Morris (2022), however, disagree and argue that there is an inhumane and nativist hidden curriculum at play in New Zealand, and each call for less violent and more nuanced approaches. In the United States, Maggiulli (2022) examined materials used in classrooms there and found that these offer "problematic and oversimplified messaging that narrowly frames the issue as binary: good-native vs. evil-invasive" (p. 1391). Our study builds on these recent analyses, adding to the conversation by focusing on the elementary and secondary school curriculum in Ontario, Canada.

Methodology and Methods

Many methodologies and methods are used by environmental education researchers interested in our relationships with other beings (see reviews by Fawcett, 2013; Spannring, 2017). Some researchers take a more anthropocentric or speciesist approach, primarily interested in how other life serves human needs (educational or otherwise) rather than how our educational efforts could improve these species' material conditions (Russell & Spannring, 2019). Theoretically, the three of us are informed by more critical approaches to environmental education that seek to disrupt anthropocentric constructions of nature, honour Land and Indigenous knowledge systems, and cultivate conditions for multispecies flourishing. Such work can be messy and require learning how to "stay with the trouble" (Haraway, 2016; Nxumalo & Pacini-Ketchabaw, 2017), an approach we deem necessary for a complex issue like "invasive" species.

The three of us are white settler scholars who live and work in Thunder Bay,[2] the Treaty Territory of the Fort William First Nation, signatories to the Robinson-Superior Treaty in 1850, and a sacred place originally known as Anemki Wajiw Wequedong. We strive to be responsible treaty partners who are engaged in respectful relationality, critically reflexive in unlearning our inherent colonial identities, and working to ensure that curriculum is accurate, appropriate, and honours Indigenous knowledge systems and perspectives (Korteweg & Fiddler, 2018). In our teaching and research, we emphasize the role that all settler educators must enact to implement the Truth and Reconciliation Commission of Canada's (2015) Calls to Action in education (#62-65) as their professional duty. We also forefront the inspirational work of Indigenous scholars and Land protectors who expose and challenge settler colonialism's inherent extractivism and insistence on human/nature binaries, who offer insights into Indigenous

knowledge systems that recognize kinship and the interdependence of humans with all life and Land, and who seek approaches that prioritize decolonizing with Indigenous futurities (e.g., Bang et al., 2014; Lees & Bang, 2022, 2023; Simpson, 2014; Twance, 2019). In addition, we are informed by the work of intersectional environmental educators who seek to understand how settler colonialism, colonialism, racism, classism, ableism, heterosexism, sexism, and sizeism interconnect with anthropocentrism and speciesism (e.g., Maina-Okori et al., 2018; Lloro-Bidart & Finewood, 2018).

These framings meant that in our analyses we needed to keep a keen eye out for anthropocentrism, settler colonial logics, imperialist Western or exclusionary Eurocentric onto-epistemologies that avoid, deny, or erase Indigenous knowledge systems, and other oppressive moves. Given our interest in how "invasive" species are represented in this time marked by climate change, species extinction, and ongoing disparities and inequities for Indigenous communities post-Truth and Reconciliation, a critical and decolonial discourse analysis seemed an appropriate approach. Other environmental education researchers have used similar approaches in their own curriculum analyses (e.g., Chambers, 2008; Hufnagel et al., 2018; Lowan-Trudeau, 2022; Lowan-Trudeau & Fowler, 2021). Like Greg Lowan-Trudeau (2022), we focused on the *explicit* curriculum (what is in official curriculum documents), the *hidden* curriculum (the implicit messages students receive from curricula), and the *null* curriculum (what is absented). The latter, we felt, was particularly important for holding responsible the "intentionally inattentive industrial and imperial practices" (Tsing, 2018, para. 20) at the root of climate change challenges faced by all species. We also found Wade Tillett and Jenna Cushing-Leubner's (2022) writing about the *material* curriculum useful because it accounts for effects on learners and the world, which for us involved considering possible impacts on "invasive" species themselves as well as the development of students' relationships with other life.

Nine Ontario curriculum documents were analyzed. The first document was the Science and Technology curriculum for grades 1-8 (Ontario Ministry of Education, 2007) and the second its recent replacement (Ontario Ministry of Education, 2022a). The third was the Social Science curriculum for grades 1 to 6 and History and Geography for grades 7 and 8 (Ontario Ministry of Education, 2013), and the fourth and fifth its replacements (Ontario Ministry of Education, 2018, 2023). The sixth was the recent "de-streamed"[3] Science curriculum for grade 9 (Ontario Ministry of Education, 2022b). The seventh was the Science curriculum for grades 11 and 12 (Ontario Ministry of Education, 2008), which includes a grade 11 Environmental Science course that is not offered by all schools but does mention "invasive" species. The eighth and ninth were the Environmental Education documents for grades K-8 and 9-12 (Ontario Ministry of Education, 2017a, 2017b), which refer to numerous courses across the curriculum. A keyword search for "invasive" was used to identify the relevant

sections, then each section was reviewed to determine where the content appeared (e.g., subject, grade), how “invasive” species were described, and if any resources or pedagogies were recommended. The curriculum analysis was contextualized by the first authors’ reflections on her experiences as a new teacher of secondary school science in Ontario reaching out to colleagues to learn how they taught “invasive” species content.

Findings

Within the Ontario elementary school curriculum, “invasive” species were covered most frequently in the 2007 grades 1-8 Science and Technology curriculum document. Here, “invasive” species appeared under “Life Systems” in grades 4, 6 and 7, in the “Habitats and Communities,” “Biodiversity,” and “Interactions in the Environment” units respectively. The definition of “invasive” species used in this document stated that they are introduced species, in contrast to a “native” species “that originates or naturally occurs in an area” (Ontario Ministry of Education 2007, p. 205), as if species migration is inherently unnatural. Newcomer species were also described as having solely negative effects on their new environment. For example, in the grade 4 curriculum, “invasive” species were listed as a factor in the “depletion or extinction of a plant or animal species” (p. 85); in the grade 6 curriculum, “invasive” species were said to explicitly “reduce biodiversity” (p. 114); and the presence of “invasive” species were referred to as “an infestation” in the grade 7 curriculum (p. 127). Zebra mussels, purple loosestrife, and the Asian longhorn beetle were listed as examples. In the new (2022) grades 1-8 Science and Technology curriculum, “invasive” species are only mentioned once in passing, in a grade 6 expectation that teachers ensure students learn to explain “how invasive species reduce biodiversity in local environments” (Ontario Ministry of Education, 2022a, p. 150).

Turning to elementary social sciences, “invasive” species featured a few times in the 2013 grades 1-6 Social Sciences and grades 7 and 8 History and Geography curriculum (Ontario Ministry of Education, 2013), and these did not change in the updates (Ontario Ministry of Education, 2018, 2023). The way “invasive” species are described in these curricula vary by grade and subject. Grade 6 students have an opportunity to learn about “invasive” species in their Social Studies course in the unit on “People and Environments: Canada’s Interactions with the Global Community” that focuses on “globalization and global solutions” (Ontario Ministry of Education, 2013, p. 126). Grade 7 teachers could also introduce this topic in Geography within the units on “Physical Patterns in a Changing World” and “Natural Resources around the World” (Ontario Ministry of Education, 2013). The grade 7 Geography curriculum describes “invasive” species as neither good nor bad and invites students to come to their own conclusions on the “economic and environmental impact of invasive species” (Ontario Ministry of Education, 2013, p. 172). The grade 7

Geography curriculum mentions the connections between human activity and the introduction of “invasive” species, although no specific activities were offered as examples (Ontario Ministry of Education, 2013).

The K-8 Environmental Education document (Ontario Ministry of Education, 2017a) encompasses much of the same information as the grades 1-8 Science and Technology document (Ontario Ministry of Education, 2007), grades 1-6 Social Sciences, and grades 7-8 History and Geography document (Ontario Ministry of Education, 2013). What stood out when examining the K-8 Environmental Education document in comparison to the 2007 and 2022 Science and Technology documents was how “invasive” species received decreasing attention over time. In the 2007 Science and Technology curriculum, “invasive” species were included in expectations in grades 4, 6, and 7. In the 2017 Environmental Education document, only expectations in grades 4 and 6 were mentioned, and in the most recent 2022 Science and Technology curriculum, “invasive” species are referred to only once, in an expectation for students in grade 6.

In the secondary school curriculum, the topic of “invasive” species showed up in a few different courses, one of which no longer exists. The grade 9 Science (academic) curriculum introduced the topic of “invasive” species in neutral language, and explicitly connected the introduction and propagation of “invasive” species to human activities (Ontario Ministry of Education, 2017). It was replaced, however, by the 2022 de-streamed grade 9 Science curriculum, which makes no mention of them whatsoever (Ontario Ministry of Education, 2022b). In the grades 11 and 12 Science curriculum, “invasive” species are defined as “[n]on-indigenous species that have adverse [...] effects on the habitats they invade” (Ontario Ministry of Education, 2008, p. 256) and zebra mussels, purple loosestrife, and the round goby are listed as examples.

“Invasive” species also feature in the grade 11 Environmental Science course. Like the grade 9 Science curriculum, the grade 11 Environmental Science course defines “native” species as “species indigenous to a particular area or region that have evolved over thousands of years, adapting to their surroundings, and have become an important part of the local ecosystem” (Ontario Ministry of Education, 2008, p. 256). “Invasive” species are described in neutral language and the curriculum links the introduction and propagation of “invasive” species to human activities like “agriculture, travel, the purchase of exotic pets, importing and exporting, releasing domesticated fish into freshwater environments, [and] the use of live bait” (Ontario Ministry of Education, 2017, p. 169). It is important to note here that the grade 11 Environmental Science course is an elective that is not offered by all schools. The remaining three secondary courses that are featured in the secondary school Environmental Education curriculum document, grade 11 and 12 Green Industries and grade 12 Canadian and International Politics (Ontario Ministry of Education, 2017), tell a different story. In the grade 12 Green Industries course, “invasive” species are described as a “biotic factor”

that negatively affects natural resource harvest and product quality (p. 248), and the focus is on “pest and disease control techniques” (p. 249) and “disposal methods for invasive plants” (p. 244).

None of the curricula we reviewed offered explicit recommendations of materials to help teach about “invasive” species. Thus, as a new teacher, the first author reached out to colleagues for advice based on how they teach the topic. Given so little guidance, each teacher sought out their own resources online. All the materials used by her colleagues reinforced problematic approaches to the topic, such as anthropocentric ways of relating to non-human beings (e.g., Canan, 2022), derogatory illustrations of introduced species, like “dog-strangling vine” attacking a young couple and their dog (Osborne, 2019), fearmongering videos about newcomer species “terrorizing,” “wreaking havoc,” or “bullying” other species “to extinction” (e.g., SciShow, 2021), and an inhumane lesson plan that encouraged students to invent devices like the “lionfish zapper” without concern for the impacts of violent interventions on individual animals (PBS, 2017).

There were also several examples of the null curriculum, which is not surprising since, as Tillett and Cushing-Leubner (2022) observe, the null curriculum is near infinite and what is noticed reflects “the values and preferences of the researcher” (p. 7). Given our theoretical frameworks and interests, two facets that were particularly glaring to us were the omission of alternative ecological perspectives and Indigenous knowledges around newcomer species. Ecological concepts that could have been included, but instead were absented, concerned the recognition that ecosystems are dynamic and thus change over time (Reo et al., 2017) and the theory of “ecological fitting” that suggests a species performing a specific role within an ecosystem can be replaced by another performing the same role (Janzen, 1985). As well, some newcomer species may contribute to biodiversity (Schlaepfer, 2018) and relevant examples from Ontario could have been used as examples, such as dandelion and plantain (Scott, 2010).

No Indigenous approaches to, or Elder wisdom on, “invasive” species were mentioned. Nor was there a single mention of an Indigenous perspective on Land relations and kinship (ecology) or Land defense and protection (conservation), such as water being understood as living versus abiotic (Lees & Bang, 2022, 2023) or non-extractivist rationales for protecting biodiversity common in Land education (e.g., Simpson, 2014). Instead, the dominant settler-colonial narrative that contrasts “native” and “invasive” species separated by Eurocentric timelines (Reo & Ogden, 2018) is embedded in the curricula.

The privileging of Western worldviews is not an oversight and, indeed, was recently revealed publicly to be egregiously intentional. In the summer of 2022, three weeks before the release of the new elementary Science curriculum (Ontario Ministry of Education, 2022a), the Conservative Minister of Education directed staff to remove Indigenous knowledge expectations from the curriculum. An education reporter made an Access to Information request and found, “Three expectations were crossed out in red, which includes having students

‘explore real-world issues by connecting Indigenous sciences and technologies and Western science and technology, using ways of knowing such as the Two-Eyed Seeing approach’… [that] emphasizes the simultaneous appreciation of scientific knowledge through both Western and Indigenous perspectives” (Alphonso, 2022, para. 9) and “the expectations of having students examine the knowledge systems of various cultures and analyze the contributions from people with diverse experiences” (para. 10). Despite having worked with Indigenous partners, knowledge holders, and education experts as members of the curriculum writing and review team, the government made a unilateral decision to remove or substantially modify 16 Indigenous-related expectations. This move was highly criticized by Indigenous members of the curriculum writing panel, including Jodie Williams (as cited in Alphonso, 2022), and by First Nations organizations (e.g., Anishinabek Nation Head Office, 2022; Matawa First Nations, 2022). As David Paul Achneepineskum stated, “Attempting to minimize or erase Indigenous knowledge in Ontario’s curriculum further divides and perpetuates the roots of systemic racism at the elementary school level—the education system should be building bridges and understanding between all cultures” (Matawa First Nations, 2022, para. 1).

Discussion

Our analysis of Ontario curriculum documents revealed a number of interesting findings. “Invasive” species content initially appeared most often in the elementary and secondary Science and Technology curricula and emphasized the negative impacts of newcomer species, with a nod in grade 9 to the fact that the introduction and propagation of “invasive” species is a result of human activity. When the elementary Science and Technology curriculum was replaced in 2022, however, the topic was mentioned only once, negatively, and the topic was removed altogether from the 2022 grade 9 curriculum. The grade 11 Environmental Science course, in which newcomer species are described in neutral language and human activity is acknowledged, remains in place, but it is an elective course that is not offered in all secondary schools across the province. “Invasive” species feature minimally in the elementary Social Sciences, but at least are described in neutral terms and the influence of human activity is mentioned, albeit only once. In the other remaining courses where newcomer species are mentioned, namely grade 11 and 12 Green Industries and grade 12 Canadian and International Politics, negative economic impacts, control, and disposal are emphasized.

None of the curricula mention concepts such as the dynamism of ecosystems, ecological fitting, or the occasionally positive role some newcomer species can play in their new environments. “Native” and “invasive” species were distinguished along colonial timelines and Indigenous contributions were willfully ignored. This curricular erasure is particularly alarming in our context

in Thunder Bay where a high percentage of students are of Indigenous identity or heritage and our schools are located on Anishinaabe *aki*/Land with rich knowledge and language systems that inform how to engage with more-than-human kin relations. The overall lack of nuance and negative rhetoric reflects dominant "invasive" species discourse and colonial logics that reproduce the binary of good "native" versus evil "invasive," an onto-epistemology that has been critiqued in analyses of educational materials and programming in other countries (Bang et al., 2014; Maggiulli, 2022; Morris, 2022; Ovid & Phaka, 2022; Ram, 2019; Willing, 2022). This negative othering is amplified by the derogatory, fearmongering, and inhumane materials that the first author's teaching colleagues adopted in the absence of recommended resources.

The explicit, hidden, and null curricula described above may result in a material curriculum that negatively impacts newcomer species and humans. For example, it can lead to cruelty directed toward individual members of targeted species, as recent analyses of the treatment of possums in New Zealand educational contexts have illustrated (Morris, 2022; Ram; 2019; Willing, 2022). It also continues the settler-colonial project of erasing Indigenous peoples, their knowledge systems, languages, and contributions, and feeds the alienation and push-out of Indigenous students from formal education. It can also feed xenophobic and anti-immigrant sentiments, which other environmental education scholars have raised as a concern (Hecht & Nelson, 2022; Henderson & Morningstar, 2022; Ovid & Phaka, 2022; Ram, 2022). Xenophobic rhetoric is evident when describing the uncontrollable fertility, reproduction, and "parasitism" of both "invasive" species and human immigrants (Subramaniam, 2001). At the same time, "native" species are often portrayed "as 'defenseless,' 'delicate,' 'fragile,' 'susceptible,' 'vulnerable,' and 'weaker' than invaders" (Larson et al., 2005, p. 251). The "invasive" Canada thistle, for example, is criticized for its reproductive zeal, and the "native" female thistles are often cast as "passive helpless victims of the sexual proclivity of the foreign/exotic males" (Subramaniam, 2001, p. 31). Likewise, purple loosestrife is despised for its foreignness and fecundity (Ellis, 2022), even though many species of bees love it (Pearce, 2015) and loosestrife has the capacity to clean water and be used for medicine (Scott, 2010). Another way in which dominant discourse around "invasive" species others living, breathing beings is through the use of militaristic terms such as "attack," "defense," "combat," "casualties," "victims," "biosecurity," and "border control" (Larson et al., 2005). Indeed, the "war" against "invasive" species has led to an entire sub-field: "invasion biology" (Davis et al., 2011). Such militarized language has material consequences for the beings with whom these wars are being fought.

One finding that did surprise us was the decreased attention to newcomer species in the most recent Ontario curriculum documents, considering how continuous media attention (e.g., CBC, 2023a, 2023b, 2023c) fuels public concern about the issue. This curricular move, however, is indicative of the general anti-environment slant of the current Ontario government (Winfield, 2022). Certainly,

the present provincial government shows a determination to make its own right-wing mark on curricula, as revealed in their attempts to surreptitiously remove the Indigenous Science Framework from the elementary Science curriculum (Alphonso, 2022). The absenting of "invasive" species as a topic and the erasure of Indigenous ways of knowing in new curricula can be interpreted as a form of ongoing colonial refusal, where the provincial government rejects their duty to educate about complex socio-ecological systems and their duty to abide by The Truth and Reconciliation Commission of Canada's (2015) calls to action explicitly focused on education (#62-65), notably the inclusion of Indigenous content and worldviews into school curricula.

Mere inclusion is, of course, insufficient. Max Liboiron (2021) makes a compelling case that all fields need to reflect on the coloniality of their practices and engage in the work to change them. Environmental educators must actively work to dismantle the structures that allow dominant settler-colonial worldviews to erase Indigenous worldviews. As Leanne Betasamoke Simpson argues, Indigenous knowledges are "threatened by land-theft, environmental contamination, the legacy of residential schools and state-run education, colonial gender violence, [and] climate change" (IWL Rutgers, 2019, 28:41-28:53). Erasure of Indigenous knowledges matters to environmental and climate change education generally, and to education about newcomer species specifically (Bang et al., 2014; Ovid & Phaka, 2022) as these offer vital counterpoints to dominant colonial discourse and approaches. For millennia, Indigenous peoples have demonstrated how to "live in ethical relationality with more-than-human others, where humans are not figured in hierarchical order in relation to others" (Nxumalo & Cedillo, p. 102) and all beings are understood as relatives, cherished for the gifts they offer, including as teachers (Kimmerer, 2015). Further, Land and ecosystems are viewed as dynamic and constantly changing, and being a newcomer is not inherently bad (Reo & Ogden, 2018). Recognizing, respecting, and engaging Indigenous knowledge systems in education about newcomer species could offer less anthropocentric, more nuanced, and reparative approaches to help students (and teachers) think critically about why some species are demonized, why certain historical multispecies communities are valued over others, and how we might grapple more humanely and collaboratively with the challenges "invasive" species pose.

Conclusion

Certain newcomer species are undeniably harmful to other species and ecosystems. Others may be deemed harmful initially, but later are shown not to be a significant threat. For some "invasive" species, their new home may be the only one they have left, and they may be regarded as both "invasive" and endangered thus under threat in both their native and new habitats, albeit for different reasons. The relationships amongst species, new and more established,

and their relationships within dynamic ecosystems are far more complex than what is currently being taught in Ontario schools. That is not surprising since "invasive" species feature so little in the explicit curriculum and when they do, the focus is primarily on their negative impacts while Indigenous onto-epistemologies are ignored. Further, Ontario teachers are not offered sufficient guidance on how to engage with humane and Indigenous pedagogies, and the materials they can easily access in the North American context about newcomer species, such as those prepared by ENGOs and conservation authorities, are likely to reinforce dominant anthropocentric and settler-colonial discourses. If recent curriculum revisions offer any indication, Ontario will continue to miss opportunities to braid Indigenous and Western knowledge systems together to help teachers offer more relevant, relational, and humane approaches to teaching about newcomer species. For now, as environmental educators, we need to be more mindful of the hidden, null, and material curricula that is being communicated to learners through the explicit curriculum and strive to offer more critical and decolonial approaches to learning about and with newcomer species.

Notes

1 When we use the term, "newcomer species," we are referring to non-humans.
2 At the time of writing, all three authors lived in Thunder Bay.
3 Ontario was the last province in Canada to "stream" students in grade 9 by "dividing students into differentiated groups based on their perceived academic ability and/or prior achievement" (Follwell & Andrey, 2021, p. 1); the shift to de-streaming began in 2020.

Notes on Contributors

Marleine Gélineau is a Land-based educator with Lac Des Mille Lacs First Nation and a teacher at Seventh Fire Junior High in Thunder Bay, Ontario. Contact: mgelinea@lakeheadu.ca

Constance Russell is a Professor and Lakehead University Research Chair in Environmental Education in the Faculty of Education, Lakehead University; she worked on the Thunder Bay campus for 22 years and recently transferred to the Orillia campus in southern Ontario. Contact: crussell@lakeheadu.ca

Lisa Korteweg is an Associate Professor working in settler-colonial, decolonial and Indigenous studies in education at the Faculty of Education, Lakehead University, in Thunder Bay, Ontario. Contact: lisa.korteweg@lakeheadu.ca

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