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Climate Change Curricula in Alberta, Canada: An Intersectional Framing Analysis

Abstract

This article is comprised of a climate change-focused framing analysis of proposed revisions to Alberta, Canada's K-6 curriculum as an ideologically motivated manifestation of curricular epistemicide. Eisner's three curricula—the explicit, implicit, and null—and scholarship related to intersectional climate and environmental justice, education, and communication provide the theoretical framework. This inquiry concludes with a critical discussion of and possible alternatives to the revised curriculum with further consideration of the implications for those involved with similar endeavours in other jurisdictions across Canada and around the world.

Keywords

Climate Change, Energy, Curriculum, Education, Alberta, Canada

Introduction

The western Canadian province of Alberta is a well-known and arguably infamous global hub of oil and gas exploration, extraction, refinement, transport, and investment (Keough & Gitter, 2021). As such, many, but far from all, individuals, families, institutions, and government entities in Alberta have connections to the petroleum industry. Conducting environmental education and research in such a context proves challenging at times (Chambers, 2008; Henderson et al., 2017). This is especially so when, as is the case in the present moment, the ruling provincial government has conservative, and generally pro-oil and gas leanings—an alliance that was particularly evident in recently proposed provincial curricular changes related to climate change education at the primary, Kindergarten to Grade Six (K-6), level (Bennett, 2020), with further changes for secondary grades to follow.

Such dynamics were notably germane and viscerally experienced this past year as western Canada experienced an unprecedented climate change related heat wave that resulted in significant loss of life, natural landscapes, and property due to heat related illness and wildfires (Azpiri, 2021; Condon, 2021; Taylor et al., 2021). Other major weather events also occurred with unusual frequency such as intense and sustained flooding in the Vancouver region and other parts of neighboring British Columbia (BC; Cruikshank, 2021). In both cases, socio-economically vulnerable populations were disproportionately impacted.

An overwhelming majority (approximately ninety-nine percent) of scientists now agree that climate change is overwhelmingly anthropogenic—it is primarily caused by human actions related to the release of carbon dioxide into the atmosphere through fossil fuel combustion in addition to other human-introduced sources such as fertilizers in agriculture (Cook, 2021; Houser & Stuart, 2020; Stuart et al., 2014; Watts, 2021). Although naturally occurring events such as volcanic eruptions, slight shifts in the earth's axial rotations and revolutions, and variance in solar radiation may result in relatively minor short-term weather changes, especially within discrete regions, they have been consistently proven to cause dramatically less climate impact in the long term—a key criterion for climate science (Hansen & Stone, 2016; Hulme et al., 1999; Wigley & Raper, 1990).

In the face of such clear and present global and regional challenges, many educators, academics, and youth in Alberta are actively speaking out to demand better climate change related educational opportunities (See albertacurriculumanalysis.ca; Derworiz, 2020; Lawrynuik, 2019). However, rather than receiving enhanced support and encouragement, the climate crisis is being implicitly and explicitly downplayed by our provincial government in curricular contexts and beyond.

Amidst nation-wide curricular revisions that have been occurring over the past several years in response to the Truth and Reconciliation Commission of Canada's (TRC) 94 Calls to Action to address the previous and ongoing impacts of colonization on Indigenous peoples (Truth and Reconciliation Commission of Canada, 2015) as well as a general rise in sociocritical and environmental consciousness (e.g., Lowan-Trudeau & Fowler, 2021), Alberta's latest curriculum revisions have been widely regarded as leading backwards rather than forwards (Aukerman, 2022; Worobec et al., 2021). In addition to the socially conservative nature of the new curriculum, it has been criticized for multiple cases of repeated plagiarism from other curricular and media sources without attribution (French, 2021) and the

overwhelming presence of conservative voices on its advisory committee, including those with well documented records of explicitly racist views (Cardinal, 2020). Practicing teachers who formally participated in the review—under a limited term non-disclosure agreement—subsequently reported that their perspectives and suggestions were routinely ignored (Edwardson, 2021). Alberta's education minister, Adriana LaGrange, also supported a panel recommendation early on in the curriculum review process that they endeavor to provide a "balanced" understanding of both the human and natural causes of climate change (Bennett, 2020)—a misleading turn of phrase and thought with dramatic implications that will be explored in detail throughout this article. Such a perspective is in keeping with provincial premier Jason Kenney's previously expressed doubts regarding humanity's central role in contemporary climate change (Meyer, 2018).

In the following, I present a climate change-focused framing analysis of Alberta's recently revised K-6 curriculum through the lens of a university based environmental academic, educator, and parent of school aged children. The current government's inadequate and inaccurate presentation of well-established climate science and associated intersectional dynamics is a clear example of curricular epistemicide (Paraskeva, 2022). This approach willfully ignores human actions as the primary cause and the undeniable social, health, economic, and ecological impacts of climate change upon our lives. It also represents a missed opportunity to embrace ever increasing environmental cues as catalytic curricular opportunities. This article concludes with a critical discussion of and possible alternatives to the revised curriculum with further consideration of the implications for teachers, teacher educators, students, and those involved with similar endeavors in other jurisdictions across Canada and around the world.

Theoretical Framework

This inquiry was generally informed by critical and interpretive paradigms (Lincoln et al., 2018; Reid et al., 2017). More specifically, it was guided by a theoretical framework informed by Eisner's (2002) three curricula and scholarship related to intersectional climate and environmental justice, education, and communication.

Although they can be applied to many related theoretical and pedagogical realms such as the physical design of classrooms and the word choices or topics covered in textbooks, Eisner's (2002) three curricula—the explicit, implicit, and null—are particularly relevant to curriculum development contexts. In curricular settings, the explicit curriculum includes those themes, topics, concepts and terms that are explicitly presented; for example, perspectives and/or specific information that is shared about climate change. The implicit curriculum is that which is presented by implication through word choice and the selection of particular topics of study; for example, including climate change in a given curriculum implies that it is an area of study worthy of consideration. The null curriculum is that which is taught by not being taught, or presented, at all—not including climate change in a given curriculum implies that it is not an important topic of study.

This study was further informed by intersectional approaches to climate and environmental justice. An intersectional climate and environmental justice perspective compels us to consider the interconnected, and often disproportionate, impacts of climate change and other environmental issues on

vulnerable and marginalized people as related to gender, culture, geography, socioeconomics, health, and other sociocultural factors (Agyeman, 2007; Kaijser & Kronsell, 2014; Lloro, 2018; Pellow, 2016).

Methodology & Methods

This inquiry was methodologically composed of a qualitative framing analysis (Lindekilde, 2014; Yocum et al., 2022) of Alberta's revised K-6 curriculum. Framing analysis was selected rather than a more general discourse analysis (Lindekilde, 2014) due to the Alberta government's overt expression of their intentions with regard to environmentally related content in the revised curriculum as previously mentioned (Bennett, 2020); it is clear that they have an agenda regarding the framing of climate change.

The collection and analysis of data was qualitative in nature—it involved identifying and interpreting the presence or lack thereof of key climate change related terms and phrases with further consideration for potentially intersectional environmental terms and dynamics. A targeted search of the publicly available Alberta Education curriculum English language database (https://curriculum.learnalberta.ca/curriculum/en) containing the entirety of the revised curriculum was initially conducted. Further specific analysis and interpretation of the more stable pdf versions released in December 2021 of the same subject specific curricula (e.g., Alberta Education 2021a, 2021b), along with related government generated summary pages and documents provided additional insight and context for the study. Previous Alberta curricula were also examined for comparison (e.g., Alberta Education, 1996).

Findings

This framing analysis revealed several key findings related to how climate change is, or isn't, presented in Alberta's revised curriculum. In addition to a general intersectional environmental justice framework, Eisner's (2002) three curricula—the explicit, implicit, and null—are particularly relevant to illuminating these findings—what is presented, what is implied, and what is missing from the curriculum speaks volumes.

Climate Change: The Null

Climate change is a largely null area of Alberta's revised K-6 curriculum. Although general weather concepts are introduced in Kindergarten and Grade Four, and global warming is obliquely mentioned in Grade Three with reference to glacial melting (Alberta Education, 2021b, p. 30) climate change is only explicitly considered in Grade Five and Six Science (Alberta Education, 2021b). The only other area of the curriculum where climate change is tangentially included is in Grade Six Social Studies via the consideration of carbon footprints—a tailored measure of how much carbon we each create through our individual lifestyles (Alberta Education, 2021b, p. 61; Dósa & Russ, 2020).

It is also important to note that, due to significant and widespread critical response, the Social Studies curriculum was undergoing further revision at the time of writing; however, the government has

indicated that the revisions will be primarily in the sociocultural sphere rather than environmentally-related (Baig, 2021;https://www.alberta.ca/curriculum-social-studies.aspx).
Waiting until the fifth grade to introduce students to climate change in earnest—a foundationally important contemporary concept—is a drastic shortcoming of the revised curriculum. Moreover, excluding climate change from robust consideration in subject areas outside of the sciences limits prompts educators to introduce intersectional perspectives which may, for example, include the sociocultural and health effects of climate change.

A False Balance

The phrasing related to climate change within Alberta's revised curriculum, especially when compared to the previous curriculum, is particularly notable. In Alberta's previous K-6 Science curriculum (Alberta Education, 1996), climate change was only mentioned once, in the Grade 5 Science expectations. However, the phrasing was clear and in keeping with prevailing scientific consensus:

- Recognize that human actions can affect climate, and identify human actions that have been linked to the greenhouse effect (Topic D-Weather Watch, Expectation #12, p. B. 27).

Although climate change is notably more present and mentioned several times in the revised curriculum, subtle, but meaningful shifts in language are employed. Specifically, rather than emphasizing that climate change is primarily and undeniably caused by human activity, the phrasing suggests that both natural events and human activities are responsible for climate change, without further discussion. For example, after listing both natural and human causes of climate change in the revised Grade 6 Science curriculum (Alberta Education, 2021a) without distinguishing which is more impactful, two subsequent expectations include:

- While climate is more stable than weather, it is also susceptible to change due to natural and human-made processes.
- Explain how natural processes and human-made processes can contribute to climate change, including ice ages and global warming or cooling (p. 52)

These somewhat subtle turns of phrase are potentially deeply impactful for both educators and learners because they imply that human and natural processes are equally responsible for climate change, which is absolutely not the case (Cook, 2021; Houser & Stuart, 2020; Stuart et al., 2014; Watts, 2021). This holds significant ramifications for educators who may not have adequate understanding of climate science to confidently emphasize for students that human activities are the primary cause of climate change. Moreover, amidst the arguably pro oil and gas context of Alberta, it leaves far too much flexibility for those who may knowingly and intentionally seek to manipulate the truth to mislead students and appease parents, administrators, or bureaucrats who wish to minimize the climate impacts of the petroleum industry.

Ethical Energy & Dog-Whistle Politics

Alberta's revised Grade Six Science expectations (Alberta Education, 2021b) related to climate and energy include the statement that "Ethical and clean energy production has the potential to reduce net greenhouse gas production" (p. 52).

The use of the phrase "ethical and clean energy" is an ideological dog-whistle (Albertson, 2015) in oil and gas contexts which smacks of greenwashing and dubious branding (Plec & Pettinger, 2012; Scanlan, 2017. Although it may seem explicitly promising in gesturing towards oil and gas production that is less socially and environmentally impactful than oil and gas produced elsewhere in more volatile or less regulated socio political and environmental contexts around the world, as its supporters may argue, it is a convenient way of sidestepping the pressing need to move more firmly away from fossil fuel dependence to reduce energy consumption in general, and increase dependence on renewable sources. As critics and pragmatists alike often suggest, renewable energy sources are not without potential social, health, and environmental impacts themselves (Richards et al., 2012; Stokes, 2013); for example, large scale hydroelectric dams in Canada have displaced Indigenous communities (Gergan & McCreary, 2021). However, on a case by case, regionally specific level, if selected, procured, and sited with social and environmental concerns and generalized energy demand reduction in mind, renewable energy is the way of the future. As such, more explicit language of this nature should be included in Alberta's curriculum in order to mitigate the potential misinterpretation of "ethical and clean energy" by educators as business as usual for Alberta's oil and gas sector.

Intersectional Perspectives

When compared to the previous Alberta curriculum (e.g., Alberta Education, 1996), intersectional perspectives are arguably better represented in the revised curriculum in relation to climate change, environmental issues, and knowledge in general. Indigenous perspectives in particular are introduced in several areas within the social studies and science curricula (Alberta Education, 2021a, 2021b). However, as mentioned above, significant concerns related to the presentation of Indigenous related expectations within the new social studies curriculum have resulted in the government instituting further revisions that are currently ongoing at the time of writing (Baig, 2021; https://www.alberta.ca/curriculum-social-studies.aspx). Although new opportunities are introduced to consider how "traditional [Indigenous] Knowledge Keepers and the scientific community can collaborate to support understanding of local climate and climate change" (Alberta Education, 2021b, p. 54), as well as climate impacts upon "agriculture, clothing, recreation, transportation" (p. 54) in general, other deeper sociocritical and intersectional perspectives (Kaijser & Kronsell, 2014) are not emphasized.

Stronger emphases, in an age appropriate manner, of the disproportionate physical and mental health burdens experienced by those with lower socioeconomic means, chronic medical conditions, and substance addictions, during and in relation to climate change related events such as heat waves, droughts, floods, and torrential storms could be introduced in Social Studies as well as Health & Physical Education. Such intersectional imbalances were clearly illustrated by the office of the Chief Coroner of British Columbia (2022), Alberta's western neighbor, in a commissioned review of the aforementioned extreme heat events in western Canada during the summer of 2021. Findings included,

for example, that "Heat related deaths were higher among persons [experiencing] schizophrenia, substance use disorder, epilepsy, chronic obstructive pulmonary disease, depression, asthma, mood and anxiety disorders, and diabetes" (Chief Coroner of British Columbia, 2022, p. 5). A higher mortality risk during extreme heat events was also identified for older individuals, residents of lower quality housing structures with inadequate passive or active cooling, and people experiencing homelessness. Resources such as this coroner's review could be provided to educators as professional development resources to support their efforts to provide age-appropriate climate change-related learning across the curriculum. Such documents may also serve to influence future curriculum development.

Government, Industry, & Individuals

In association with the greenwashing of energy impacts through the use of terms such as "ethical energy" as indicated above, possible individual actions (Alberta Education, 2021a, p. 52) that can be taken—and are important—are emphasized in the revised Science curriculum rather than placing the primary onus upon corporate and government regulated industries, energy producers, and transportation providers—the largest sources of carbon dioxide emissions by far (Government of Canada, 2021; United States Environmental Protection Agency, 2021). This is another example of the null and implicit curricula at work to neatly obfuscate the realities of climate change and society which mirrors the Alberta Government's general climate change website (https://www.alberta.ca/climate-change-alberta.aspx)—an inherently contradictory production. Although the website explicitly states that 97% of scientists agree that climate change has been predominantly caused by human activity and contains data and figures related to CO2 emissions in Alberta from the oil/tar sands and other sources, it concludes with suggestions for individual actions that can be taken to combat climate change, with no mention of government or industry responsibility. Taken together, such statements and curricular absences will incorrectly lead learners and under informed educators to perceive climate change as something which is dissociated from heavy industrial activity—the primary culprit—that might be solved through individual action alone—a false notion. These dynamics clearly reveal curricular epistemicide of a well-established body of knowledge built upon climate science and research-based understanding of the intersectional impacts of climate change upon vulnerable populations that may prove inconvenient to some industrial and political stakeholders.

Discussion

The implications of these findings are significant for practicing teachers, students, and teacher educators alike. Climate change is a daunting wicked problem (Vink et al., 2013) that requires the full force and collective ingenuity of individuals, communities, and the world at large to critically consider and combat. Alberta's newly revised curriculum undercuts such efforts by explicitly obscuring basic climate change principles, implicit language manipulation alongside superficial efforts at intersectionality, and a looming null wherein climate change is not actively introduced until Grade Five, and only then in Science. This approach neglects the dramatic implications of climate change in other areas such as social

studies, the humanities, and health and physical education.

Teachers who are well-versed in true facts regarding climate change will feel inevitable pressure and tension as they attempt to simultaneously navigate this government mandated curriculum while sharing accurate knowledge with their students. Those teachers who are less knowledgeable or confident will be easily led astray by Alberta's revised curriculum that couches the sharp realities of climate change in apologist rhetoric that panders to the oil and gas industry through the falsely "balanced" lens endorsed by the current conservative government, and greenwashed turns of phrase such as "ethical energy."

Teacher educators in this province face an equally challenging task in working with student teachers in the sciences, and again, perhaps even more so with elementary generalists who may not have extensive grounding in the sciences. Many teacher educators will also inevitably feel, and perhaps continue to express, the tensions associated with these charged topics and working ethically and morally with undergraduate and graduate students in these areas.

As noted earlier, it is also important not to discount the knowledge of students in K-6 settings, and K-12 more generally, who may be well versed in climate science due to familial and/or supplementary community based learning and, if presented with ambiguous or false information such as that proposed in the revised curricula, may well encounter conflict with their teachers and peers amidst such cognitive dissonance.

Other theoretical and practical inspiration might be drawn from critical media and scientific literacy (Cooper, 2011; López, 2017)—approaches that seek to equip learners with the tools to independently consider scientific and media derived information, regardless of what a particular government policy may mandate at a certain time. Educational stakeholders from various perspectives may find strength in such approaches.

More tangibly, we might also look to other jurisdictions such as BC, which recently introduced a full K-12 curriculum revision that explicitly includes climate change along with numerous other socio-environmental topics throughout its primary Social Studies curriculum from intersectional perspectives (British Columbia Ministry of Education, 2016). For example, students are progressively introduced to the challenges of contemporary climate change in Grade Two (British Columbia Ministry of Education, 2016b, p. 12); climate change responses by individuals, communities, and governments in Grade Five (p. 24); and climate-related critical media literacy in Grade Six (p. 28). However, it is also noteworthy that climate change is not heavily emphasized in BC's primary Science curriculum (British Columbia Ministry of Education, 2016a). The aforementioned extreme heat mortality review (Chief Coroner of British Columbia, 2022) and other similar research-based sources may assist in expanding educational efforts in future iterations of BC's curricula.

Although the central Canadian province of Ontario offers a disappointingly generic glossary description of climate change in its primary Science curriculum as being caused by both natural and human causes without distinguishing between the two (Ontario Ministry of Education, 2007, p. 154) that is reminiscent of Alberta's as described above, it provides strong examples of intersectional engagement with climate change in its revised Social Studies curriculum (Ontario Ministry of Education, 2018). Specifically, the expectations for Grade Five Social Studies ask students and teachers to engage with

concepts such as Indigenous climate related knowledge, and the need to critically consider and include multiple voices during climate policy development and potential resource extraction projects (Ontario Ministry of Education, 2018, pp. 113, 119-120).

As such, it appears that, although climate change related curricular progress has been made in other Canadian jurisdictions to a certain extent, further work remains to fully introduce more critical and clearly articulated perspectives across curricula and subject areas that firmly emphasize human beings' primary culpability for contemporary climate change. Considering the wide-ranging findings of BC's coroner's review as an example for all jurisdictions, in addition to a well-established body of academic literature (e.g., Kaijser & Kronsell, 2014), explicit intersectional connections to climate change could be made well beyond the sciences and social studies to include health and physical education, the humanities, and technology and design, among others. A more comprehensive nation-wide curriculum review of this nature may prove insightful as would exploration of related approaches in international contexts.

Conclusion

In this article, I presented a climate change-focused framing analysis of Alberta's recently revised K-6 curriculum guided by a theoretical lens informed by Eisner's (2002) three curricula—the explicit, implicit, and null—and scholarship related to intersectional climate and environmental justice. An ideologically motivated paucity of misleading and inadequate climate change content was discovered in Alberta's revised curriculum—a clear manifestation of curricular epistemicide that ignores established climate science, increasingly observable environmental cues, and intersectional impacts. I concluded with a critical discussion of and possible alternatives to the revised curriculum with further consideration of the implications for those involved with similar research and curricular endeavors in other jurisdictions across Canada, keeping in mind the international and wicked nature of climate change. Adopting an intersectional approach to climate change curricula that recognizes the central culpability of human activity will foster more informed, invested, and action-oriented understanding for learners and educators alike.

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