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Must we wait for youth to speak out before we listen? International youth perspectives and climate change education

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ABSTRACT

In recent years, youth across the planet have begun to mobilise, motivated by the perceived injustices associated with the causes, consequences and politics of climate change. However, education systems lag behind, preoccupied with the "what" and "how" of climate change, rather than engaging it as a social issue in which students themselves are implicated. In this paper, we share the results of our participatory research exploration into youth and climate change through an international education project, in which 99 students from 13 countries joined virtually in a climate change learning experience, culminating in the collaborative development and presentation of a White Paper to the 2018 IPCC Cities and Climate Change Conference. Grounded in a critical global citizenship education framework, this project provides a site to explore climate change education from the perspectives of diverse youth, who inform possibilities for climate change education that addresses justice, individualisation and emotionality.

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The youth of the country can start by educating the adults . . . (Delhi, India, Blog 2b)

Climate change intersects with youth wellbeing in numerous ways: in the form of rapidly unfolding impacts already foretold, which will continue to escalate over their life course, and in the effectiveness of our collective efforts to stave off a climate catastrophe by eliminating future emissions. Youth across the planet have begun to mobilise in response to these realities, motivated by the injustices associated with the causes, consequences and politics of climate change. Educators have a responsibility to inform students about climate change, but even more crucially, to help students envision and enact alternative futures. The dominance of the natural sciences in climate change education has resulted in the exclusion of important social, political, cultural and economic components of climate change that are necessary to a comprehensive understanding of global warming causes, impacts and response pathways. This exclusion compromises the capacity of youth to process growing awareness and personal experiences of climate change, and to develop essential citizenship skills. Climate change education must move beyond the conventional science classroom designed to answer

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"what" and "how" questions to begin to approach questions of "why", by engaging climate change as a social issue in which students themselves are implicated.

The framing of climate change as a scientific and technical problem is not restricted to classrooms; it is reflected in western institutions of research and policy, in which the knowledge, experience and worldviews of "non-experts" – Indigenous peoples, people of colour, those living in the Global South, youth – are excluded. In addition to the exclusion of valued knowledges, scientific exclusion can be viewed as a form of colonialism, whereby colonised peoples have been objects of research and policy to their cultural and material detriment. Ensuring that these groups, including youth, are active contributors to climate change education development, therefore, is an important means of decolonisation.

As white women positioned in a Canadian university, we have had the privilege of engaging in a unique climate change education initiative with a diverse group of youth from across the planet: the Intergovernmental Panel on Climate Change (IPCC) Cities and Climate Change Project (subsequently referred to as The Project). This initiative brought together 99 secondary school students from 13 countries, who joined virtually in a climate change learning experience that culminated in the collaborative development and presentation of a White Paper to the IPCC Cities and Climate Change Conference, in Edmonton, Alberta in March 2018. From this position, we pursued two research questions: how is climate change conceptualised and experienced by students from diverse international contexts? How might these conceptions inform climate justice education? We sought to listen to these young people to learn how we, as educators and policy makers, might respond in our various positions according to our decolonial, intersectional understanding of climate justice. While youth are often represented in climate literature as "the future" or "the hope", educational systems are accountable to them *now*.

Below, we provide an account of what education's role in promoting climate justice could – and should – be, through an analysis of The Project. To set the scene, we share an overview of youth exclusion from climate policymaking despite the pressing nature of this issue for young people. We then situate our research in previous literature on climate change education, which evidences a gap in justice-oriented approaches to climate change education despite youth interest in this area. Next, we articulate critical global citizenship education, which guided the development of this education initiative and provided a framework to expand climate change education to address related issues of justice and social change that are relevant to youth action. To engage with youth typically excluded from policymaking, we then describe The Project and share youth perspectives on climate change that might inform education moving forward. In closing, we explore the implications for education policy of the key themes that emerged in our study: justice, individualisation and emotionality.

Background

Global warming threatens every aspect of the ecosystems within which societies are a part, and emissions continue to rise. Impacts are already observed, including increasing average temperatures, rising sea levels and, most vividly, increases in frequency and intensity of extreme events like flooding, drought, forest fires and novel diseases. These impacts are not experienced equally; regions and groups with lower capacity to cope and

adjust – both human and more than human – have been and will continue to feel the effects disproportionally.

The probability of avoiding catastrophic socio-economic impacts as a result of global warming is unlikely without abrupt and substantial declines in anthropogenic emissions (Intergovernmental Panel on Climate Change [IPCC], 2018). The main source of those emissions, however, is the burning of fossil fuels, which is the predominant source of energy used around the world. Shifting energy systems away from fossil fuels will require sufficient political support to challenge vested interests, as well as broad dissent from status quo norms, beliefs and lifestyles that are premised on such high levels of energy consumption. The social, political and cultural barriers to doing so are multiple, but perhaps the most glaring is injustice. Enormous disparities in sources of historic and present emissions across the globe are directly mirrored by disparities in vulnerability to climate impacts, fostering the growing application of a climate justice frame to environmental politics among researchers (e.g. Weiss, 1989) and activists (Kluttz & Walter, 2018; Roberts & Parks, 2009). Injustices are exacerbated by differences in political power that support the marginalisation of the very individuals and groups who are most at risk, and are predicated upon the invalidation or denial of majority-world perspectives (Levinson, 2012; Menton et al., 2020).

If there is one group whose elevated exposures to the risks of a rapidly changing climate are most obvious, it is youth (O'Brien et al., 2018). Many youth, motivated by the vivid injustices associated with the causes, consequences and politics of climate change (Akiva et al., 2017; Checkoway & Aldana, 2013; Gordon, 2007), have mobilised a global movement (e.g. Escobar, 2015; Hayward et al., 2014), and the proportion of youth who have not participated actively but who nonetheless are aware and concerned is much larger (e.g. Berse, 2017; Tanner, 2010). Nonetheless, youth are excluded from climate policy decisions, despite the fact that those decisions will affect them to a far greater extent than the decision-makers (Gibbons, 2014) and despite their capacity to contribute to policy and planning (e.g. Berse, 2017; Tanner, 2010). Civic engagement can also prepare youth for responsible citizenship (Checkoway & Aldana, 2013; Kurth-Schai, 1988). Direct participation in political protest has been shown to provide youth with the social support necessary for expressing dissent from prevailing norms (O'Brien et al., 2018).

The United Nations Framework Convention on Climate Change (UNFCCC) does encourage youth participation. Youth were recognised as an independent stakeholder by Agenda 21 in the 1992 Rio Earth Summit, the international meeting in which UNFCCC was established (United Nations Conference on Environment and Development [UNCED], 1992). However, youth, defined as individuals aged 15–24, did not in fact gain constituency status in UNFCCC proceedings until 2009 (United Nations Framework Convention on Climate Change [UNFCCC], 2010; as cited in Thew, 2018). Even then, the *Guidelines for the Participation of Representatives of Non-governmental Organizations at Meetings of the UNFCCC* has restricted participation of school-aged youth by stating that "representatives shall normally be at least 18 years of age. Younger representatives may be registered at the discretion of the secretariat" (United Nations Framework Convention on Climate Change [UNFCCC], 2003). Young people's access to decision-making in many other climate policy fora remains marginal; youth seeking to engage often endure "tokenistic treatment in adult-dominated processes" (Narksompong & Limjirakan, 2015), when they are accommodated at all. Barriers to youth participation in politics are often justified by

the assertion that youth have limited capacities for such participation (Gordon, 2007). As Checkoway (2011) notes, popular portrayals of youth as irresponsible, withdrawn, or otherwise as "problems" go largely unchallenged by either youth or adults (Finn & Checkoway, 1998; Kurth-Schai, 1988). As with other marginalised groups, experiences of exclusion or token participation can lead to disengagement (O'Brien et al., 2018; Taft & Gordon, 2013). Those refusing to stand down, and with the organisational resources to do so, are left with few options for recourse other than civil disobedience.

Climate change education

While young people are taking to the streets, another important site for the development of youth knowledge, creativity, efficacy and collective action skills in the face of climate change is the classroom. Climate science education as it is often taught today, however, does little to address the intersecting social, political, cultural and economic components of climate issues, or for building the skills needed to participate in collective planning to address uncertain futures (Busch et al., 2019; Hayden et al., 2011; Siegner & Stapert, 2020). If education systems are to be accountable to youth, we need a full-scale shift in our approach to climate change in the classroom, focusing on justice, political skills, active learning and social network support.

The need for such shifts has been recognised, and in some places is underway. Though much climate change education still focuses within science-related disciplines, climate change education increasingly links social, political and economic components with the environmental through holistic, cross-curricular and transformational learning that seeks to mitigate climate change and address related vulnerabilities and injustices (Bangay & Blum, 2010; Busch et al., 2019; Jickling, 2013; Waldron et al., 2019). Krasny and DuBois (2019) recommend community-based learning, promoting citizenship education that connects the complex of environmental and social components of climate mitigation and adaptation. Field (2017) asserts collaborative climate learning, crossing boundaries through participatory knowledge production that engages with the larger community, along with "connected learning", utilising digital communications to promote equity rather than enhancing existing advantages. Others recommend foregrounding political learning in climate education, where students come to understand decision-making powers so that they have the tools to participate in collective action (Hayden et al., 2011). Based on a study in Swedish schools, Öhman (2009) recommends students learn to critically examine the "knowledge basis, interests and values" (p. 51) supporting sustainable society through deliberative exchange about potential futures, rather than indoctrination of students and behavioural prescriptions. Russell et al. (2013) assert that climate change education must take an intersectional approach, supporting explicitly anti-oppressive practices. Together, transformational and justice-oriented approaches to climate education seek to "[challenge] systems of entrenched power that continue to maintain status quo conditions that have created the issue in the first place" (Busch et al., 2019, p. 9).

Research in this area is still emergent, however, and few studies explore climate change education within social studies, humanities, or interdisciplinary contexts (Busch et al., 2019; Monroe et al., 2019; Siegner & Stapert, 2020). Stapleton (2019) evidences a paucity of research on climate justice education in particular. Even when climate change

education does connect the science to student behaviour, it tends towards instrumentalism, endorsing predetermined outcomes, stripping youth of their agency (Blanchet-Cohen et al., 2003; Hayden et al., 2011; Jickling & Wals, 2008; Levinson, 2012) and limiting critical thought. Finally, climate change education research is largely focused on northern and western contexts (Busch et al., 2019). Considering the global nature of the climate crisis, including issues of intra- and intergenerational justice, it is critical to explore educational strategies that enhance understanding of the differential contributions to, effects of, and responsibilities for responding to climate change across diverse yet interconnected contexts. Our research study thus contributes a much-needed perspective to the academic literature on climate change education by drawing on the perspectives of youth from various contexts globally who participated in a justice-oriented climate education project.

Global citizenship education

To create a transformational and justice-oriented curriculum and deliberative process for students in The Project, we drew upon critical approaches to global citizenship education (GCE) (Andreotti, 2014; Pashby, 2011; Pashby & Sund, 2020; Shultz, 2007, 2015). While Education for Sustainable Development (ESD) is a common framework for addressing climate change education (Anderson, 2012; Blum et al., 2013; Læssøe & Mochizuki, 2015; Mochizuki & Bryan, 2015), we found critical global citizenship education (GCE) to be better suited to the goals of education for climate justice (Waldron et al., 2019). Despite supporting "respect for diversity, solidarity and the promotion of equality in both local and global contexts" (Waldron et al., 2019, p. 897), ESD has been critiqued for its vague and contradictory definition (Blum et al., 2013; Selby & Kagawa, 2010), anthropocentrism (Kopnina, 2012), colonial and universalising approaches (Sund, 2015; Sund & Öhman, 2014) and for normalising consumerist culture and individualist responses to climate change (Jickling & Wals, 2008). Liberal forms of GCE have much in common with ESD and similarly exemplify these issues (Waldron et al., 2019); however, *critical* GCE exposes and addresses assumptions, biases, contexts, imbalances and injustices associated with global issues such as climate change. Decolonial in its orientation, critical GCE counters epistemic violence by legitimising non-western knowledge systems, questioning naturalised western notions of growth and development. Acknowledging the power relations inherent to the global system, critical GCE addresses the interrelationships, structures and processes underlying global climate injustices, encouraging students to move beyond individual responses to collective action from their differential positions.

Critical GCE involves reflexive, learner-driven processes whereby diverse students are encouraged to face their own culpability and vulnerability, and strive to imagine ways to engage in more "informed, responsible and ethical action" (Andreotti, 2014, p. 7). Through a contextual, intersectional and transdisciplinary approach, critical GCE locates diverse students "within differentiated sets of histories, experiences, literacies, and values" (Giroux, 2004, p. 66), then engages seriously with the requisites of a just global society. Critical GCE thus enables a much-needed intersectional approach to the analysis of climate issues (Kaijser & Kronsell, 2014), and of the structures that enable and disallow student agency across various contexts. Such engagement avoids leading students towards prescribed modes of action, whereby students are encouraged to follow

conventional – and potentially ineffective – responses. Instead, critical GCE involves a "pedagogy of transformation", which, according to Shultz, is key to establishing "new ways of negotiating between local and global actions and agenda, resolving conflict, and acting in solidarity" (qt. in Pashby, 2011, p. 61) within complex and dynamic global relationships. Within climate change education, solidarity might extend to the future inheritors of today's actions, both by working against the socio-environmental oppression of future citizens and by taking into account these citizens' "hypothetical consent" to current actions (Postma, 2006, p. 20). By thus considering both local and global, as well as current and future contexts and relationships, students learn to consider new ways of being and relating to one another. Critical GCE guided curriculum development and pedagogy for The Project, as described below.

The project

From January to March 2018, 99 youth, from public and private high schools in 13 different countries either volunteered to participate, or were nominated to do so by their teachers. Participants collaborated using online tools to exchange ideas on the roles of cities, youth and education systems in addressing climate change as part of the Intergovernmental Panel on Climate Change (IPCC) Cities and Climate Change Project (The Project) through the Centre for Global Education, facilitated by one of the authors. Participant schools were selected to ensure geographic diversity, with schools located in São Paulo, Brazil; Calgary and Edmonton, Canada; Beijing, China; Bogotá, Colombia; Accra, Ghana; New Delhi, India; Bekasi (Jakarta), Indonesia; Nairobi, Kenya; Monterrey, Mexico; Huánuco (Lima), Peru; Ptuj, Slovenia; London, United Kingdom and Los Altos (Bay Area), United States. The inclusion of both public and private schools helped to diversify socio-economic representation within the project. Notably, students in all schools had sufficient familiarity with English to participate.

Students worked both in their home classrooms and collaboratively using online technology, under the guidance and facilitation of their teachers, one of the authors and a group of undergraduate students from an environmental sciences programme who served as mentors. Our GCE framework undergirded both online curriculum and pedagogy, providing content and examples that were relevant for students, as well as flexibility for teachers to adapt the programme according to their home school contexts. For six weeks, students carried out in-class and online activities, including blog posts and presentations at videoconferences. The undergraduate mentors provided feedback on student learning, asking questions and encouraging students to read and engage with the posts of students in other schools. Students initially explored topics within their home cities and schools, considering how climate change interacted with their unique and specific notions of a good life. These initial activities encouraged students to unpack their own beliefs and assumptions, and reflect upon their local contexts, before engaging with the ideas of others. Next, with the support of their teachers, students in each school worked through bilateral collaborations with youth from a school in a different context (i.e. global North and global South), comparing their civic and school contexts using online tools such as Google Docs, WhatsApp, Skype, or Messenger. They then shared and extended their learning within continental groupings, including videoconferences with students from (a) South, Central and North America; (b) Africa and Europe and (c) Asia and Oceania. Finally, students shared their summative learning in a global virtual town hall.

Following two months of online learning and collaboration, a group of 14 youths, selected by their teachers and representing the majority of these schools, travelled with their teachers in March 2018, to Edmonton, Canada, where they drew on all the work of their peers to collaboratively write a position paper, the International Youth White Paper on Climate Change: Education and Cities. Students represented all participant locations except London and Monterrey, though students from these places were encouraged to participate remotely. In Edmonton, students worked together for a full week through a deliberative writing process, selecting and developing key themes using examples from The Project blog posts, jurying art to include in the paper and working to ensure the voices and perspectives of all participant schools were included. Rather than imposing perspectives, facilitators asked students critical questions and focused students on the components of the paper that mattered most to them. As a result, it was the voice of the youth that was presented at the IPCC Cities and Climate Change Science Conference, hosted in Edmonton, Canada, where it was applauded by IPCC officials and civic representatives from cities planet-wide, acknowledged in the Conference's concluding remarks, and included in the online conference report. Following the IPCC conference, students returned to their schools with the paper and presentation, which they were encouraged to share with their home communities and the other students who had participated in the larger project.

Data collection

Data collection and initial analysis were conducted by a student research team consisting of 16 senior undergraduate university students participating in a degree-capping project for the course, "Research Methods and Policy Applications in Applied Environmental Sociology" at the University of Alberta, under the direction of the second author. Students collected data from two sources: 297 blog assignments posted in the virtual classroom as part of The Project, and 14 in-person semi-structured research interviews separate from The Project but conducted while the delegate students were in Edmonton. Blog posts addressed: (a) connecting the carbon footprints of individuals and cities, (b) (re)considering our expectations of the "good life" in relation to climate change causes and effects, (c) comparing climate vulnerabilities in different cities, (d) developing decision-making models for addressing climate change and climate injustices in cities, (e) applying the model to students' home cities and comparing across contexts, (f) considering how membership in the global community impacts local climate decision-making, (g) recommending roles for schools and youth in climate justice. Interview questions focused on participants' personal and educational experiences with and responses to climate change, and their involvement with The Project. We also supplemented our analysis by closely reading the students' White Paper, as presented at the IPCC.

An iterative approach was used in a qualitative thematic analysis of blogs and interviews. Preliminary analysis of blog text was guided by seven pre-set codes (consequences of climate change, contributors to climate change, awareness/attitudes, scales, justice, solutions/taking action and emotional response) developed by the student researchers from an initial reading of the data. Further analysis and inter-coder collaboration gave rise to three prominent themes, elaborated upon in the following section: (a) climate change

as an issue of justice, (b) structural causes with individualist solutions and (c) emotional responses to climate change.

Findings

Climate change: an issue of justice

Among the most prominent themes expressed by our participants was justice, involving observations of differences in vulnerability and accountability. Many participants referred to more-than-humans and the planet itself in their deliberations about justice.

Participating youth were quick to perceive stark differences in vulnerability to climate change without being prompted, indicating that such inequities are readily apparent to them. Many of the following comments were expressed when participants were asked to share their personal experiences of climate change. The first comes from a student living in Canada but who previously lived in China:

> The heat spikes . . . could be deadly if people do not cool down their bodies and in China from personal experience as I have lived in Hong Kong, Beijing, and Kaiping, and Guangzhou for parts of my life, most families there rely on air conditioners to keep themselves cool whenever they're at home. People who may not have the luxury to afford an air conditioner potentially are more susceptible to heat stroke and other health conditions attributed to long exposure to heat such as dehydration. (Edmonton, Blog 2b-1)

> Climate change impacts people directly by putting things such as shelter and access to food and water at risk through increased extreme and inconsistent weather patterns, for example, hurricanes. Changes in weather can also put jobs at risk, like a farming season becoming shorter. This is beginning to happen where I live, farmers near Edmonton can have trouble dealing with the inconsistency and prolonged winters or summers. (Edmonton, Blog 2a-2)

Perhaps to an even greater extent than their sensitivity to differences in vulnerability, all of our youth participants commented upon inequities in the attribution of responsibility for causing climate change, and consequently for addressing it, highlighting an acute sensitivity to fairness. Participants also were quick to acknowledge their own privilege, which for some contributed to a sense of guilt. Discussions of inequity in responsibility and accountability were often quite elaborate. Some began with a recognition of the capacity of some people to affect the wellbeing of others:

> I can't speak for my city but I believe in climate change justice being an ethical and political issue. As a child I know that I cannot contribute much to global warming but I am being affected by it greatly or weakly. One person can change the living and likeness for others. (Nairobi, Blog, 3b-1)

Notably, for many of our participants, differences in attribution of responsibility were often discussed in general terms of political jurisdiction – nation states or cities – with less attention to more specific divisions of power and responsibility, such as certain economic sectors, corporations, or political parties.

> Justice is to give everyone what they deserve. When it applies to climate, China, India, Russia, Germany, and the USA generate most of their energy from carbon, burning carbon produces CO2, and this makes the climate change and their countries get the benefits, but other countries like Peru don't get any benefits and we suffer from droughts, melting glaciers,

> natural disasters, and more. We aren't the principal guilt, also we pollute, but we aren't the biggest one. I am not saying that we are not going to do anything, the biggest culprits must repair what they did and we all should too. (Lima, Blog 3b-1)

Some participants, however, did refer to class dimensions of responsibility; for example:

> Most of these [low income] people don't have any political/social power and opinion, they don't contribute much to the climate change because they don't have much money so they don't have cars and don't buy much stuff. (São Paulo, Blog 2b)

For many, justice included accountability to animals and more-than-human beings. A strong sense of relationality pervades the students' engagement in climate issues as they recognise: "we aren't the only living beings, we coexist with a lot of animals and plants, we can't allow that our greed hurt all the others living beings" (Lima, Blog 1A). They describe the planet as a collective home, though they recognise that experiences within it are uneven. The students connect their motivation to act for the climate to their recognition of the planet as a collective home for current and future populations, and a sense of how inaction is in fact an act of injustice towards this home.

> This is our home, right? The earth is our home, and we have to take care of it. It's our home, but it's not OUR home. It is something that every generation will give to others. (Bogotá, Interview 1)

In relinquishing ownership of the planet, this youth speaks out of line with western colonial understandings of the planet as a resource (Tuck et al., 2014). While some youth do express views that the planet exists *for us* to enjoy and to love, several students expressed a more relational perspective, viewing the planet as possessing value in and of itself as well as in relation to human beings. One student speaks of how his love for animals motivates his climate action (Los Altos, Blog 1B), and another expresses love for the planet by describing the devastation of landscapes:

> I really love our planet. Its views and different places … The islands, are they just gonna be flooded in a few years? Tropical rainforests I've never visited? (Beijing, Interview)

Some students lament "every day that passes we are killing the Flora and Fauna" (Lima, Blog 1a-2). They recognise the interconnectedness between human and diverse forms of more-than-human life:

> As large amounts of forests are cleared away, allowing exposed earth to wither and die and the habitats of innumerable species to be destroyed, the indigenous tribes who depend on them to sustain their way of life are also irreparably damaged. (Nairobi, Blog 2a-2)

One student describes the rivers in her country in a way that captures layers of agency within interconnected forms of life, as "in charge" but "calling for help":

> The Colombian rivers are in charge of supplying drinkable water of many people and satisfying the living beings, but today is when this rivers are contaminated in a level never seen before, they not only contain toxic elements, due to industrial wastes, but also are manipulated by the population in order to get sand, stones and much more materials, as consequence some rivers are livingless. The view of these rivers look like a spot dry, empty, black, and calling for help. (Bogotá, Blog 2c)

Taken together, these examples capture a sense of accountability to the planet as a whole grounded in justice, fairness, love and a desire to respond to the planet's needs.

Structural causes; individualist solutions

Despite comprehension of climate change as a complex, structural issue, when describing how they might act to address climate change and climate injustices, students tended towards individualist behaviours in response to a deep sense of guilt over consumptive practices. While expressing hope that aggregate individual actions might bring about the change required, students struggled to conceive ways individuals might participate in collective and structural change alongside people who are most vulnerable to climate effects. The Project itself, however, developed among the students a sense of relationality to one another and the potential for collectivity.

Students frequently reiterated a strong sense of agency, understanding themselves as "the problem and [it] is our responsibility to become the solution" (Lima, Blog 4b-1). Students' impetus to act was grounded in knowledge of their own differential culpability, as well as their privileged positions compared to those who were more vulnerable due to social and economic oppression. Despite their structural understanding, however, they often responded with an individualised sense of guilt:

> We all always like to blame other people, but we are the real guilty, our behaviors hurt the planet . . . we are the most contaminating things, first the consumption from all the people that I know. (Lima, Blog 2a-1)

This guilt was linked with consumerism and wealth privilege, as well as selfishness:

> Climate change problems did not start with the large corporations of the world and national governments. Climate change started with people whose daily choices fed their power, production, and their popularity. (White Paper, p. 2)

An impetus towards individual action spanned cultural, geographic and socioeconomic contexts. Students from Jakarta, Delhi, San Francisco, Lima, Bogotá, Accra and Ptuj asserted the need for individualised lifestyle adaptations, with statements such as "there are many things you can do to reduce your own carbon footprint. Simple things" (Calgary, Blog 1 c-1). Although many acknowledged the limited impacts of any one individual's actions, the students expressed hope that, as stated by one student, "if everyone does a little thing at the same time, the effect would be fabulous" (Beijing, Blog 4b).

Some students nonetheless recognised that "green" lifestyle choices are not accessible to everyone:

> Ghana doesn't have the largest demographic of rich people - a lot of people are below the poverty line. So, it's kind of like, you can tell them about climate change, but then they are trying to survive. You know, so it's kind of like, I can't tell them, 'Oh, buy a water dispenser' when they can barely afford water for the family. (Accra, Interview)

Despite this, students rarely questioned the prioritisation of individual lifestyle choices in climate action, indicating limited consideration of the many institutional forms of endorsement of consumption, and the need for organised resistance to challenge them.

When they did refer to structural change, participants often called upon government leadership, including, for example, restructuring of food systems (Calgary, Blog 1 c-2), limiting marketing that perpetuates capitalist ideals (Lima, Blog 2a-3) and imposing policies on industries (São Paulo, 2 c). Yet this enthusiasm was often paired with

conflicting critical observations of governments' lack of follow-through (Jakarta, Blog 1a), prioritisation of the fossil fuel industry over climate action (Edmonton, Blog 4a-3) and abdication of responsibility:

> Near my house, I saw that small companies throw oil waste in the river. I told the police officers, like the government part of my town – it's not Bogotá, it's a little town near Bogotá – so I told the government of my town and they said 'that's not our problem, that's Bogotá's problem'. And my mom told the government of Bogotá and they said 'that's not our problem, that's Chia's problem' – the name of the town that I'm in. So there's no, they pass the guilty, there's not a guilty. That town is responsible – no the city is responsible – so no one is taking action, the people just contaminate the river and the streets as they want. (Bogotá, Interview 2)

Students had a strong sense of citizen agency and a desire for citizens to be educated about climate issues in order to participate democratically and contribute to change. However, their limited conception of participation focused on voting, despite their own exclusion from voting due to their age. They did not discuss the role of collective citizen action and organising, nor did they mention possibilities for marginalised peoples – including those, such as young people, without a vote – to speak back to governments and institutions.

Collaboration and collectivity did emerge, however, as expressed in students' deepening sense of relationality through the friendships made during this project. Discussing climate in an international context helped students understand the interconnectedness of their experiences. As they express in their White Paper,

> Through the connections we make with other global community members, we are able to share information based on our experiences and gain a great understanding of how we are truly all connected. (White Paper, p. 9)

Notably, students tended to gloss over differences in positionality among themselves. They spoke less of being radically challenged by others' positions and more of the eye-opening and motivating experience of learning across borders:

> Getting to talk to all the other students sparked so many ideas, let's get the community and let's go … The best part is getting to hear perspectives from other students from so many people from all around the world. (Calgary, Interview 2)

For some, connecting to one another across borders built a sense of hope and efficacy fuelled by friendship.

> I feel more empowered seeing all these other people around me who care about it as well … So it made me feel like I can do bigger things, like encourage, like school integrating climate change into curriculum. (Accra, Interview)

Emotional responses to climate change

Research has identified a range of emotional responses to climate change and their bearing on action, but less attention has been paid to emotions experienced by youth (O'Brien et al., 2018). Our observations of emotions expressed by the youth in this study exemplify the importance of educators acknowledging and providing space for the processing of youth emotional responses to climate change. Our project provided us

with the opportunity to observe personal emotional responses to climate change expressed by youth in our study, including fear and despair, often expressed in some form of, "if we don't act, the human species/planet will die"; grief for observed and expected losses, particularly for animals and vulnerable people; guilt and shame engendered through knowledge about personal impacts; confusion and frustration regarding a perceived lack of response by authorities and hope, often inspired by observing others' actions.

The most common direct emotional responses to climate change information and experience included helplessness and despair:

> When I first [started reading about climate change] I cried, because I was like - I wanted to, like, to do so much but then, I'm just one person. And I felt so helpless because I couldn't do, I felt like I couldn't do anything. (Accra, Interview)

> All the countries that signed [the Paris Agreement] agreed we had until 2050 to change the climate change reality, otherwise it's game over, we can't change any more. I feel fear because we're in 2018, we have less than 32 years until 2050. (São Paulo, Interview)

> Later, this student said, "I feel ashamed about being part of this race". (São Paulo, Interview)

Grief invoked a sense of urgency, rather than withdrawal, among some:

> I just want to say to all the people in the world . . . we have to bring our home back. We cannot lose our home . . . if we keep doing the things that make the world sick, then our future, then we may possibly not have a future. (Jakarta, Interview)

Raising the possibility that youth may not have the capacity to avoid unpleasant emotions through denial, this participant specifically calls for avoiding psychological distancing. Some students, particularly from the Global South, expressed what Ojala (2012) identifies as an essential crisis coping mechanism: *positive reappraisal* – acknowledging the seriousness of a situation without losing a sense of hope and commitment to address it:

> We must raise awareness about something more than our routine, the celebrities on tv, the new fashion this month, the friends on social networks; and be in the real dying world, and don't pretend that we are ok, because it is false. (Lima, Blog 4b-1)

In a different blog entry, this same student stated:

> Always there are challenges and opportunities, sometimes the challenges are really difficult, but behind it there are a lot of opportunities . . . All people always have an influence even when they don't know. (Lima, Blog 2b-1)

Yet maintaining positive reappraisal takes work:

> In the average climate activist's mind . . . it's always like, the internal battle between hope and despair . . . there's moments where I'm just flush with large amounts of hope, like, 'I can actually change this! We can stop this!' And there's parts where there is, like, despair where it's like, 'Well, if we're going to stop this wouldn't we have stopped it by now?' (Accra, Interview)

We also, notably, observed the degree to which emotions are shared experiences. On the one hand, witnessing avoidance and denial in others can feed despair, as expressed by this participant:

> If you see politicians be like, 'Climate change is not real.' . . . That really just gives me a lot of despair, it makes me feel hopeless . . . These people are very powerful, and if this is what they think, what can - how does what I think even matter anymore? (Accra, Interview)

On the other hand, feeling a sense of belonging within a supportive group can be essential for cultivating hope and commitment. Brown (2016) suggests that youth are far more likely to feel hope if they have positive role models. Several participants, particularly those located in the Global South, mentioned certain popular figures on social media as sources of inspiration: role models who provide them with a sense of camaraderie when such camaraderie is lacking in their personal and familial networks. Importantly, this project also revealed the tremendous potential for cultivating those same constructive emotions through involvement in a collective educational initiative. Several youths expressed new-found pride and confidence in the achievements of the group, and an elevation of hope as a direct result of their participation. Many who had shared feelings of hopelessness and despair at the beginning of The Project indicated they would be returning home with renewed enthusiasm and commitment to addressing climate change in their communities, no longer feeling alone in their efforts. As stated by one participant, "I have that, that hope that there are people in other countries and other cities that are ready to combat climate change, as a team" *(*Delhi, Interview).

Participants' emotions were often shaped through observations of the emotions, beliefs and actions of others.

Discussion and conclusion

The students' responses to The Project anticipated the youth climate strikes that emerged a year later, exhibiting intellectual and affective dedication to climate justice that helped us as researchers further understand the nature of the shift needed in climate change education informed by a global citizenship framework.

In keeping with research that recommends engaging complex emotions in global and climate education (Akiva et al., 2017; Siegner & Stapert, 2020; Sund & Öhman, 2014; Sund, 2015), this study evidences how providing youth programmes that "create an environment of heightened feelings of belonging, competence, connectedness, safety, mattering, and well-being" (Akiva et al., 2017, p. 22) can be an effective means of cultivating the confidence and efficacy – essential requisites for hope in the face of catastrophic climate change. Discourses that depict the urgency of climate change impose a heavy emotional toll on all of us, but particularly for youth. While frank discussions about the impacts of climate change are essential, so too are hope and efficacy. According to Nairn (2019), several conditions facilitate hope among youth activists: naming climate change as a collective problem, being part of collective action, connecting to the global climate movement and reaching the point where climate change becomes a part of everyday discourse. The first three of these conditions, notably, describe the importance of not feeling alone in facing this emergency. The personal relationships formed among students generated new opportunities for climate learning, countered feelings of isolation and inspired action. Their ability to learn from one another gestured towards how relational and holistic climate education might draw positionality, context, emotions and experience into discussions of climate through an intersectional approach (Kaijser &

Kronsell, 2014), but without objectifying or further victimising marginalised and climate-vulnerable students for the learning of others. As a Black climate essayist at Columbia University, Mary Heglar, reminds us, when speaking of racial capitalism, colonialism and climate change: "climate rage is a normal response to these injustices and continued violence" (Burton, 2020, para. 20). For Heglar, hope is a "White" concept that potentially overwrites the actions of people of colour as they respond to climate injustices out of rage or sorrow. In considering the place of emotions in climate change education, Heglar's critique reminds us how, by confronting fear and despair and facing humanity's (Sund & Öhman, 2011; Todd, 2015) contribution to overwhelming and potentially unstoppable devastation, students could be led to question responses to climate change that do not attend to marginalised perspectives or take up issues of justice. Where emotions are typically "treated in all their particularity, as specific issues to be addressed therapeutically, juridically, spectacularly or disciplinarily rather than being treated as elements of larger signifying chains or political formations" (Dean, 2005, p. 56), climate-induced emotions expressed by youth could thus offer openings for theorising news ways of being together on the planet.

Together, our participants adamantly rejected consumption and expressed hope in spreading awareness and behaviour change. At the same time, their return to individualism and lack of critical engagement with alternative perspectives indicates a need for climate change education to help students engage across significant differences while also pursuing global citizenship and solidarity. It is clear in the students' responses that they struggle with a growing perceptual awareness of the seriousness of climate change, while trying to process this according to the limited problem-solving tools they have been exposed to through school, including individual responsibility and government leadership. Despite their dissatisfaction with the status quo, students largely exhibited dominant neoliberal, individualised understandings of climate change responsibility (Kent, 2009; Schindel Dimick, 2015). In their focus on individual behaviours, students revealed how we as educators have not helped them consider societal alternatives to the very capitalist structures they resisted, such as imperatives for growth and profit accumulation that contribute to climate change and its related injustices (Haraway, 2015; Moore, 2016). Instead, through a pervasive sense of individualised guilt and responsibility, students paradoxically exhibited a linear view of causality despite their systemic understanding of climate change – a view that is appealing – and familiar – because of its certainty and solution orientation, along with its easy division of the world into perpetrators and victims (Waldron et al., 2019).

This view is problematically accompanied by a tacit acceptance of inequalities (Schindel Dimick, 2015), positioning youth as change agents over and against those framed as "vulnerable" or "victims", rather than supporting solidarity and global citizenship. It is invigorating to see the students' sense of agency to address climate issues, even at their own sacrifice. However, in keeping with neoliberal individualism, this agency bordered saviorism, particularly as one student notably expressed how "people who are poorer will not be very active in solving climate change" (Beijing, Blog 4 c). Though many students sought to work for a "common good", they did not recognise how people considered to be climate "victims" may offer alternative knowledge and possibilities for addressing climate change. This gap indicates how climate change education might better help young people understand the ways agency might be enacted and shared in solidarity through accountable collectivity with vulnerable peoples and in support of vulnerable species.

The students' reiteration of neoliberal, individualist responses even to justice-oriented understandings of climate change indicates a need for climate change education that guides students critically – in a purposeful and sustained way – through a systemic understanding of climate change in ways that inspire alternative solutions beyond individual action. While this was indeed an aim of The Project, the students' predilection for individualist responses indicates the prevalence of neoliberalism and the difficulties in fostering the "epistemic disobedience" (Mignolo, 2009) required to think and respond outside the norm (see also O'Brien et al., 2018). Following Tilley and Parasram (2018), therefore, we see how an even more deeply decolonial approach to climate change education might help students question their naturalised assumptions, recognise the contributions of those they may have dismissed as climate "victims" lacking in knowledge and consider alternative futures. Through a decolonial approach, climate education could enable students to recognise that the Eurocentric colonial knowledge system undergirding both capitalist and socialist systems is not in fact universal, and there are alternative ways to understand relations to the land beyond its value as a resource for human use, economic gain and unilinear development (Tilley & Parasram, 2018, p. 308). By questioning western universality, students would be more prepared to engage with possibilities emerging from knowledge systems defined as "pre-historical" or "unqualified" according to western terms but may offer other "ways of relating to and with land/nature/one another on terms that are other than, or more-than modern" (p. 306). By learning to dialogue with other knowledge systems – or, depending on students' positions, by having their existing non-western knowledge systems legitimised in the classroom – students might be better prepared to exercise the "epistemic disobedience" necessary to consider alternative actions and futures.

Climate change education needs to abandon a "save the planet" mentality in favour of multiple, differential, contextual and accountable responses. It may thus extend further than The Project in engaging non-dominant knowledge systems; questioning naturalised conceptions of growth and development; exploring the historical victories of social movements; learning from practical successes in energy transition and reorganisation of production and considering radical alternatives to dominant climate actions. As an example, climate change education might conduct case studies on such collective projects as Navdanya (2016), a network of 122 seed banks across 22 Indian states that links biodiversity and food sovereignty in the face of climate change with the rejuvenation of Indigenous knowledge systems and culture. While The Project did in fact draw such cases into the curriculum, it perhaps did not sufficiently help students connect these cases to their own contexts in order to unlearn and reconsider normative individualist modes of action. Additionally, despite the future orientation of climate action, climate change education may in fact engage in critical historical study; for instance, it might trace the emergence, development, challenges and impacts of collective action – including, for instance, the recent youth climate strikes, along with their anti-racist and decolonising components – rather than celebrating government leadership or focusing on heroic individuals such as Greta Thunberg. In keeping with critical GCE, climate education thus must involve considerable unlearning (Andreotti, 2014), a process that might integrate intellect and emotion as students learn to question, confront and perhaps reject ways of being that are comfortable, familiar and loved.

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