

It's going to take a system: Realizing the transformative potential for climate education and climate literacy in K-12

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Good morning. Thank you so much for including me in your professional development day. I know these days are precious and I am honored to be included, and excited that so many of you have chosen to focus on climate change education out of the many choices you had. I'm sorry I can't be there in person!

I am not a K-12 teacher, and I came to teaching as many university professors do, by being hired to be a faculty member with a research portfolio and subject matter expertise. Over the years of teaching here and at several other post-secondary institutions, I have learned a great deal about curriculum design and teaching – learning by doing – with the input of learning designers and colleagues and students.

But I do not profess to have the depth of expertise in teaching and curriculum design that you have. I am a psychologist by training, and for the past over 15 years I have been designing and delivering graduate programs and courses focused on the human dimensions of disasters, and more recently, Climate Action Leadership and climate adaptation.

My research lab, the Resilience By Design lab at Royal Roads University, engages in a wide range of action research and curriculum design projects focused at this nexus of climate change, disaster risk reduction and resilience. For a significant part of that work, I and my interdisciplinary team have engaged with youth, and educators, and youth serving organizations impacted by disasters and climate impacts here in BC, Alberta, Missouri, Puerto Rico, and the Yukon.

So, what I can, hopefully bring to this conversation, is some expertise in climate change education, and experience working with youth to contribute to their growing understanding of the climate crises and the rapidly escalating threat of disasters and climate impacts, while also supporting and empowering them as leaders and innovators to focus on designing strategies and projects to increase their own resilience and that of their communities.

For the past two weeks I have been managing the impacts of COVID, especially the fatigue that comes with COVID. When I thought about what I would say here today, I was trying to imagine your fatigue – being on the front line of COVID for the past three years, leading the roll out of reconciliation in education, supporting students trying to make sense of the conflict in the Ukraine, and now in Israel and Gaza, all while teaching the required curriculum as you prepare students for jobs, and university, and life. You must be exhausted! And now you are being asked, or perhaps volunteering to take on climate change education as another component of what you, as teachers, *need to do*.

But it is true. Climate change education **is** absolutely necessary. We know – from science, from lived experience, from every dimension of our being- that our lives are entirely dependent on complex natural systems---this amazing planetary web of life of which we are a part...and yet all over the world these crucial systems are being destroyed, approaching – or in some cases already crossing - tipping points that will result in irreversible changes which will result in turn in a new world which may or may not sustain human life. The signs are all there...heat domes, massive extended wildfire seasons, dying coral reefs, disappearing ice caps and glaciers, increasing incidence and magnitude of

extreme weather events, extended, deep droughts, and the loss of hundreds potentially thousands of species each year.

So, everything points to the crucial role that education needs to play in creating not only climate literate citizens, but citizens who can channel their fear into knowledge and action and who can see themselves as part of a community of purpose and resolve with the competencies necessary to challenge the status quo and potentially turn this catastrophe around. We need citizens who experience themselves as empowered with knowledge and skills and opportunities to help their families, their communities, and society as a whole prepare for and be resilient in the face of the devastating impacts of climate change while continuing to fight vigorously to slow climate change down by drastically reducing greenhouse gas emissions.

I want to acknowledge that the choice you made to come here today already suggests that you understand this. That you already recognize the need for climate change education, and recognizing that need, that many of you have already begun integrating climate change into your curriculum. There are about 60 of you here...which is fantastic and not to be diminished.... but I am also struck by the fact that this topic of climate change education has been framed **as only one** of many topics...just as it is in the news, in our politics and policies, and in our daily lives. And for me that begs the question - How is it that we are facing the biggest existential threat to our existence as a species, and we continuing to frame climate change as *just another topic amongst many?* Addressing climate change is about whether and how we survive and how much of the planet and the thousands of other species that share this planet we will take with us if we choose **not to survive** by choosing not to take on the crucial changes we need to make, **in order to survive**.

Climate change education is crucial to our shared ability to make the deep and fundamental changes we need to make in **how** we are in the world, **who** we are in the world, and **what we do** moving forward if we are to **have a world**.

Students today have grown up with climate change as their reality. They know it exists, most I believe understand that fossil fuels and greenhouse gases are driving global warming...or more realistically, global boiling as the Secretary General of the United Nations Antonia Gueterras has described it.

Today's young people can see the systems collapsing around them, and many of them are experiencing the immobilization of anxiety and hopelessness as they look to a future that appears at the very least to be bleak and more likely to be horrific...as they witness a present that doesn't seem to have the leadership and courage necessary for slowing this catastrophe down.

And despite this reality, for the most part young people are not learning about the deep causal roots of climate change, nor about what they/we can do to change the trajectory of global boiling. They, like most or many of us, are distracted, disconnected...and distraught, when what we need them to be, what we all need to be, is motivated, inspired, collectively empowered as change makers to tackle systems and structures that are not working for the majority of humanity...and which have caused and continue to fuel this crisis.

Climate change education is, therefore, ultimately, not about adding another subject to an already overfilled agenda in our schools. It is about sparking a revolution in thinking and being and inspiring the possibility for reimagining the world and our place in it and taking action to create that new reality.

Okay...when I wrote that, I have to say I thought to myself...well they may not see themselves as having the capacity or the mandate to spark a revolution. In fact, some of you may not even agree that a revolution is needed. But by applying a climate lens to curriculum we can cultivate the seeds of transformation....

- the critical thinking and systems skills necessary for analysing the historic cultural, economic, and political causes of climate change in order to hospice the values and practices that created this mess and which we can no longer afford to cling to,
- the ethical decision-making skills necessary to identify and amplify the values and practices that can hopefully carry us forward in a better way...those of sustainability, equity and justice;
- the communication and media literacy skills necessary for distinguishing fact from fiction;
- and the storytelling skills that will contribute to creating new, generative, equity focused, cultural, political, and social narratives – narratives that can inform the design of a future these young people and their children and grandchildren and their children will want to live in.

With climate change as a lens on curriculum you, we, as teachers can support students developing their ability to collaborate and facilitate the complex, interdisciplinary, multi-sector conversations, and partnerships necessary for creating effective and just adaptation approaches, for imagining and designing innovative mitigation strategies, and for building sustainable alternatives to the world we have created. As teachers we can also help them recognize that those abilities, those competencies associated with collective action, creativity, and cooperation are **some of** if not **the** most important, sought after, and transformative skills they can bring to their careers and lives.

With a climate lens on curriculum, we can plant and nurture the seeds of deep reconciliation...as Jocelyn Joe-Strack, the Indigenous Knowledge Research Chair at Yukon University says “the work of “reconnecting” is climate action...it's about healing and being in harmony with oneself, the community and the land...a pathway that can lead us to return to balance, return to harmony, return to circular thinking, and to community,”

So, where are we at with climate change education generally? To date, where it has been included in curriculum at all, it has been largely relegated to science classes which focus on how global warming works, on energy flows and how carbon operates in earth’s climate systems, the effects of greenhouse gas emissions, understanding ecosystems and biodiversity, and such things as recycling, and reducing plastic waste. That is all good and it’s important in of itself, but it is not enough. Climate change is not just a scientific issue and it’s not just an environmental issue. Climate change is a complex problem that arises from a complex web of socio-cultural systems, ethics, politics, language and communication, psychology, and civics – in short all of the subjects that are taught in our schools.

The good news is that a growing number of teachers, teachers such as yourselves, get it and recognize that we need to be integrating climate change education into and across the curriculum. A recent survey released by Learning for a Sustainable Future (*Canadians’ perspectives on Climate change and education, 2022*) suggested that over 50% - not all by any means – but a majority of teachers understand this need.

The bad news is that of the teachers surveyed who included climate change content already, between 35-59% of them spent only 1-10 hours a year on climate change topics and most of the teachers polled spoke of not feeling confident about how to go about teaching climate change.....about not being provided with the resources and professional development and training that would support their capacity to implement climate change education, and not having adequate time or support to develop this curriculum nor be able to deliver it, in already packed academic schedules. Does this ring true for you?

This and other similar research suggest that educational systems are not prioritizing climate education despite the climate crises being the biggest existential threat ever. And this further implies that society as a whole – all the political, social, and community systems that wrap around schools are also not prioritizing climate change education.

The majority of parents are not calling for climate change education; the majority of politicians are not calling for climate change education, and those from the labor market who provide guidance on what should be educational priorities are also not calling for climate change education– despite the growing number of climate related jobs and jobs that require a climate lens on existing skills.

So ... how do we move climate change education forward?

I think we need to shift from thinking about climate change as the addition of another subject, to thinking about climate change education as a lens we apply to all subjects.

Teaching about climate change opens the possibility for students to explore the biggest real-world issue they face and to do so in ways that provide opportunities to ignite their sense of purpose and their potential as leaders and innovators.

Climate change education can provide opportunities to bring science and social science together; to take informed risks in learning and practice, to exercise courage, and, if we can teach it in ways that mirror the interconnected nature of the problem and the world, such education can offer opportunities for collapsing the kinds of disciplinary silos that we know are an impediment to addressing climate change and all complex problems.

Effective climate change education can support students to explore and prototype solutions and by doing so feel empowered and capable of making a difference. It will help them hone the knowledge skills and mindsets that will further their ability to drive change and create new possibilities for their future and ours.

And it calls on them to challenge the status quo – what high school student doesn't want to do that?

So, what might effective and comprehensive climate education look like?

History - Young people need to understand and critically deconstruct the history of the policies and decisions that have led to the climate crisis. How the Industrial Revolution and the narrative of perpetual growth, wealth and entitlement have driven colonisation and the historic and ongoing looting of lands and resources at the expense of people and the planet. They need to understand how the history of climate change is one of compounding injustices and disparities that chart the rise of developed countries. But they also need to explore the history of social movements how they arise, how they are sustained, where they get constrained, and why collective action is needed to address systemic and structural issues.

Social Studies - Students need to engage in ethical discussions about climate change, critically considering the moral implications of our actions on the environment and on other populations. Have opportunities to discuss topics like intergenerational justice and the duty to protect the planet for future generations. They need to understand how policies are made and how to influence those processes.

Economics - They need to be supported in critically analyzing economic systems and models and understanding that the current global economic model is **a** model, not **the** model. They need opportunities to explore and discuss market failures, externalities, the tragedy of the commons, the free rider problem and the limitations of net zero and international climate agreements. They also need a chance to explore alternative economic models like circular economies, local sustainability models, and social entrepreneurship and how these models can offer solutions that better align with environmental sustainability and social well-being.

Science- Students need to be introduced to systems thinking and complexity theory, helping them to understand the interconnected nature of ecosystems, and social, and economic systems. They need to understand tipping points, and feedback loops.

And they need to learn how to apply systems thinking to analyze the climate crisis, considering how changes in one part of the system can affect the entire ecosystem, and they need to understand unintended consequences, uncertainty, and emergence and the need for holistic and interdisciplinary approaches to address complex issues.

In science classes, students can also use real-time data and climate models to help explore solutions like methods of carbon sequestration, nature based approaches such as restoring wetlands and grasslands, reforestation, and the possibilities and limitations of electric battery and green energy technologies.

English studies – Students need to be able to recognize the power of narratives and discourse to shape reality and how the dominant narrative has shaped and continues to shape the climate crises. They need to develop their own skills for storytelling in order to convey not just facts - which we know do not change behavior - but stories that inspire, enliven and create empathy and rapport. They crucially need to develop the ability to critically assess the language and framing used in climate discussions and be able to analyze how media, advertising, and culture influence our perceptions of nature and sustainability and what it means to be human.

Arts & Culture - students need opportunities to explore and express how they are feeling about climate change and their future, in community with each other. Artistic expression offers a powerful tool for doing that. Through arts and cultural studies students can discover the power of art as a climate communication tool to raise awareness, to communicate both the challenges and the potential solutions to climate change and shape meaningful conversations about the future.

The trades provide many applied opportunities to learn new green technology and technical skills for the clean energy transition. They can develop competencies for new professions such as wind turbine technicians and solar panel installers and sustainable and adaptive building design, electric vehicle mechanics, sustainable agriculture.

Climate change is part of the DNA of this generation of students – they’ve grown up knowing about it. Now we need to help these students to move beyond simple awareness to a deeper understanding of the deep rooted systemic causes, the impacts and consequences, and potential climate actions. We need them to break the cycle of blind obedience to an assumed and unquestioned narrative that continues to promote the idea of perpetual economic growth ...and the idea that we can change this crisis without **actually changing** what we do.

We need a generation, generations plural, of citizens who can challenge the cycle of production, consumption, and waste that is rapidly cooking this beautiful planet and us along with it.

And here you are. This is where you come in.

Even though you are already grappling with the impacts of COVID on you, your students, and your classrooms.

Even though you are already tasked with the expectations of standardized testing.

Even though you are the front line of helping students understand, embrace, and enact reconciliation.

You showed up here to try to figure out how to add in climate change education into your curricula, or how to do that better if you are already are integrating it. But it’s not about this resting only on your shoulders.

Just as effective climate action is a whole of society affair, effective climate change education is going to require a whole of system approach – and we all need to be advocating for that.

UNESCO and other global and regional organizations are arguing for a whole of institution approach that encourages and resources climate change education within and across all domains of school life and in ways that incorporate holistically the cognitive, socio-emotional, cultural, and action and justice-oriented components. This is the kind of education that also creates an open space for students to speak about and learn how to manage climate and eco-anxiety and to practice what Joanna Macy describes as active hope:

“Active Hope is not wishful thinking.
Active Hope is not waiting to be rescued by some savior.
Active Hope is waking up to the beauty of life
on whose behalf we can act.”
(Macy, J., & Johnstone, C. (2022). Active Hope: How to face themes we’re in with
unexpected resilience and creative power. New World Library)

Climate change education is about weaving the threads of climate change and active hope into the fabric of our educational systems, across disciplines, and from a young age.

Yes, students will require new technical knowledge, and new technological knowledge and we need to offer that as well. But what they will fundamentally require over the course of their lives and careers are the skills you are likely already teaching – the skills of the 21st century – critical thinking, creativity, collaboration, communication, information and media literacy, flexibility and adaptability, emotional intelligence, leadership, and initiative.

In this way, climate change education offers a way to open possibilities for a more relevant, motivating, empowering, and yes, potentially transformative educational experience for students **and** teachers. It can connect education and learning to the world, it can motivate action, encourage collaboration, and foster essential life skills and values that promote environmental stewardship.

We are living in a pivotal moment in human history. Our students are living in a pivotal moment in human history. And instead of looking at the addition of climate change to curriculum as a burden, another **have to**, we can see it as a powerful lens through which to ignite the passion and innate desire for purpose and meaning that we and our students share.

By incorporating climate change education into our K- 12 curriculum – and beyond - we can prepare the current and future generations as informed, active, and compassionate citizens who will work towards a more sustainable and equitable future.

Let's co-design this critical knowhow together, with your expertise, with the insights and passion of students, and with the help of folks like me from universities. Our future and the future of your students depends on climate action. We are rowing in this canoe together and I hope we embrace this opportunity for change...I am convinced that our future depends on it.

Thank you.