The climate literacy revolution

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In this article the author shares a vision of transforming education into a force that will accelerate a transition to an ecological civilization. This vision informs the work of the Center for Climate Literacy at the University of Minnesota, which seeks to build a global community of teachers dedicated to implementing universal climate literacy education in their classroom practice. Drawing from scholarship in the environmental humanities, they champion the notion of climate literacy as a broad narrative competence (rather than a narrow science competence) that is available to all from a very early age. They believe that climate literacy can be integrated across all subject areas, at all grade levels, in all schools everywhere. Their pilot programs with math, English, biology, Chinese and social sciences teachers confirm that climate literacy education can be organically seeded, and then scaled up, even within the current education systems – as long as teachers are given the resources, training and support they need.

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How do we design ecocentric education? Would it require an overhaul of the current education paradigm or can it be embedded in the existing structures and grown from within? No less importantly: what does ecocentric education mean and what difference can it make at the present moment of accelerating climate emergency and biodiversity loss? In this reflection I share a generative vision developed by a group of educators and humanities scholars in response to these questions. Our proposal is not a silver bullet that will 'solve' the climate emergency. We offer instead a set of scalable strategies that can be implemented by teachers in any classroom, within any subject area and at all grade levels. We believe these strategies have the capacity to help teachers and students build the conceptual tools they need to grasp the human–planetary predicament of the Anthropocene, thus transforming education from within at a grassroots level. Our umbrella term for this learning is *climate literacy*: an understanding of the climate emergency that includes facts and numbers (*i.e.* climate science, environmental science and other fields) but focuses primarily on developing values, attitudes and behavioral changes

aligned with becoming good Earthlings, kin to all life. Climate literacy is about developing a capacity to care for every creature's ecospheric inheritance and thus safeguard the Earth's integrity in the present and for future generations (Oziewicz, 2023a). This vision of climate literacy is how we see ecocentric education in practice.

The emergence of climate literacy education

Historically, calls for 'greening' education have been part of the environmental discourse from the outset. In *Our Plundered Planet* (1948), Fairfield Osborn argued that it is a mistake to think of nature as existing outside of society; in *A Sand County Almanac* (1949), Aldo Leopold championed the concept of a holistic environmental ethic – a land ethic; Eugene Odum's *Fundamentals of Ecology* (1953) introduced the idea of ecosystemic connections; and Rachel Carson's *The Silent Spring* (1962) drove home the lesson about how modern technology is capable of destroying entire ecosystems. This initial awakening led to a spate of revolutionary developments in the 1970s: the creation of the US Environmental Protection Agency, the first Earth Day, and the first large-picture studies of how human expansionism threatens nonhuman life – especially John Harte and Robert Socolow's *Patient Earth* (1971) and Donella Meadows and colleagues' *The Limits to Growth* (1972). Starting with the 1968 UNESCO Paris conference, and then with the Stockholm (1972), Belgrade (1975) and Tbilisi (1977) declarations, these ideas gave rise to environmental education. Environmental education has since evolved into a massive field led by professional organizations and flagship journals, especially *The Journal of Environmental Education* and *Environmental Education Research*. Yet, while many theorists and practitioners maintain environmental education's original ecocentric focus, mainstream environmental education has largely dropped its radical transformative edge, becoming a melioristic, anthropocentric, "neo-liberal project that undermines everything [original] socially critical E[nvironmental] E[ducation] stands for" (Kopnina, 2012: 710). On its own, environmental education has not and will not make a difference in the face of accelerating biodiversity loss and climate change. Like mainstream environmentalism, it has become part of our growth-addicted industrial civilization.

Nowhere was this blunting of the ecocentric focus clearer than in the emergence of the concept of *sustainability*. Sustainability was coined as – and remains – an economic concept. It helped define the Global North–South divide and helped identify unsustainable production-consumption patterns of the North as key drivers of poverty and environmental degradation in the South.

Famously, the World Commission on Environment and Development report (1987), *Our Common Future* (the 'Brundtland Report') defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (16). It recognized, correctly, that sustainability is the outcome of embracing ethical rather than market values. That said, the report also called for improving

technologies and social organization to better manage "the ability of the biosphere to absorb the effects of human activities" so as to "make way for a new era of economic growth" (16). The goal was to "achiev[e] sustainable development by the year 2000 and beyond" (5). Oh yeah, this went really well!

On paper, it looked great. Sustainability was quickly embraced as a solution to having and eating the cake of unlimited economic growth vis-à-vis a grudging acceptance of biophysical planetary limits. It led to the first UN Conference on Sustainability and Development, the so-called Earth Summit, in 1992 and then to a series of other international conferences – starting with Kyoto in 1997 – that led to the Paris Accords of 2015. The failure of all these voluntary agreements to slow down, let alone reverse, biodiversity loss, climate change and other externalities of a global industrial economy is widely acknowledged (UN Framework Convention on Climate Change, 2023) yet the conversation continues – and it should. Simultaneously, UN agencies negotiated targets that were packaged into specific frameworks: the Millennium Development Goals (2000–2015) and then the Sustainable Development Goals (2015–30). Both of these included an educational component called, variously, 'education for sustainability', 'education for sustainable development' or 'environment and sustainability education'. Compared to environmental education, education for sustainable development is at once more promising (in some ways) and more limited (in other ways) for engaging with the current metacrisis. For example, after it was coupled with the climate focus, sustainability considers economic, political, social and cultural factors as facets of the same larger challenge of civilizational transformation (UNESCO, 2010). Yet, through its conceptual marriage with 'development' – a less ecocidal term for economic growth – sustainability is also more susceptible to be used in the service of the entrenched petronormative interests.

The third and most recent strand of 'green' education has been *climate literacy education*. This strand emerged in the 2010s, somewhat parallel to education for sustainable development, but specifically in response to the climate emergency rather than to the challenges of economic development. Climate literacy – also called 'climate change education' and 'climate science literacy' – has been understood in two ways: on the one hand, as a narrow, technocratic, science competence and, on the other, as a holistic, multidisciplinary, socio-cultural competence. I have sketched the relationship between these two in another piece (Oziewicz, 2023a) and I'm one of the many voices (Beach *et al.*, 2017, Bang *et al.*, 2022) suggesting that the narrow science framing cannot get us far. For example, in the US the Next Generation Science Standards (2013) include climate change as a sub-idea within the Earth Space Science Progression core idea for grades 6 to 12 – with a mere few hours of learning per year. In this framing, climate change is absent from Life Science and Physical Science core ideas, which has the effect of masking its entanglement with our food systems, physical environments, consumption habits, dominant ideologies and other spaces of human activity that drive climate change. We can do better and we must.

Toward climate literacy: Our premises and commitments

In 2022, after years of network-building with scholars across the world, we established the Center for Climate Literacy at the University of Minnesota (https://climateliteracy.umn.edu/). The Center serves as an institutional home base for a range of projects aimed at transforming education, at a grassroots level, into a force that will help usher in an ecological civilization. Our target audience is teachers: we believe that given training, support and resources, every teacher in every grade and every subject area is able to incorporate elements of climate literacy in their classroom teaching. Our membership, however, is open to everyone, in academia and beyond, from librarians, authors and creatives to people across all professions: everyone who was a child, or has children, or wants to see education becoming a force to ensure a livable future for human and nonhuman people alike. We believe in mass-scale collective work across domains, such as advocated by Alexander (2022), or the Climate Majority Project (https://climatemajorityproject.com/). However, our focus, much like Project Drawdown's job function action guides (https://drawdown.org/programs/drawdown-labs/job-function-action-guides), is on work within one specific professional domain: education. Teachers as agents of change are critical and irreplaceable for this task. K–12 education is a massive socio-cultural system. It involves a large percentage of every country's population – over 16 per cent in the USA if you count students and teachers alone, and over 40 per cent if you include their families, administrators and support staff (see https://nces.ed.gov/FastFacts/). Climate literacy education delivered at schools thus has the potential to impact many millions. This impact is direct, deep, and part of one's everyday learning rather than occasional extracurricular activity – even if it is a regular school strike like Fridays for Future.

Our work at the Center rests on two premises and three commitments. The premises include a recognition of where we are and a vision of where we want to be. The former is a truth imperative: We're waging a war against the planet and we're winning. All main systems of our civilization – our politics, industries, law, economy, education and others – were created without concern for the biosphere. We're destroying our only home like we have no other choice – except we do. This leads to our second premise, which is that a different future is possible. We have sleepwalked into the climate emergency because we are a climate illiterate society, caught up in a "human-supremacist worldview" that takes the planet for granted and sees all its life forms as subject to human whims (Crist, 2019: 3). We can wake up from this nightmare and leave the ecocide behind: it's not who we are. We have the knowledge, the ability and the means to transition to a sustainable, just and ecological civilization.

We believe that education is key to accelerate this transformation, and this informs our three commitments:

i. Commitment to climate literacy. We believe that in order to transition to an ecological civilization we need to achieve universal climate literacy. As I suggested earlier, climate literacy is different from environmental and

sustainability literacies. It is also different from, and wider than climate science literacy. Climate science education is necessary, but it is naive to expect it would be enough to trigger the social and political change needed to transform our societies' attitudes and structures of perception. Just as science was not enough to end slavery, win women's rights or challenge racism, climate science will not be enough to engender a societal transformation commensurable with the challenges of the climate emergency. This is because climate change and other urgencies of the Anthropocene are not a STEM (Science-Technology-Engineering-Math) issue. They are a *worldview* issue and consequently require a holistic, expansive approach. This is why we promote climate literacy as an understanding of the climate emergency that centers on developing values, attitudes and behavioral changes aligned with how we should live to be good ancestors, good kin to all life and stewards of sustainable futures.

ii. Commitment to education. We believe that teaching about climate change should be at the heart of our educational practice. Schools are ground zero for this effort. Climate literacy can be scaffolded and should be taught to all K–12 students across all subject areas, especially with care-centric frameworks like CLICK (Oziewicz, 2023b). So far, because climate change has been largely absent, marginalized or ghettoized as a STEM issue, schools offer next to nothing in terms of preparing young people for the challenges of living in a climate-altered planet, let alone empowering them to be agents of change. We need education that will do just that, from an early age and across all subject areas. Our teacher development initiatives demonstrate that teachers are eager to incorporate climate literacy components in the subjects they teach. This teaching works. We only need to scale it up.

iii. Commitment to stories. We believe that stories for young audiences are the primary tool for building universal climate literacy. Stories are 'easy' tools inasmuch as they speak to even very young Earthlings, yet they are also the most advanced tools we have, capable of evoking emotional responses and rewiring our cognitive architecture at any age. A massive body of research across several disciplines shows that human minds are evolved for narrative understanding (Boyd 2009; McGilchrist 2022) in which our meaning-making happens through processing all content of our embodied experience as stories or components of stories (Herman, 2013; Stibbe 2021; Nxumalo *et al.*, 2022). This recognition – that stories are the primary means by which individuals and societies navigate reality – is also the core premise of the environmental humanities. Although our technocratic, reductionist, techno-fix obsessed culture continues to deny it, climate change is not primarily a challenge to our technologies but a challenge to our story systems. Our future will be determined by developments in the space of language and imagination: by whether we are able to embrace new ways of ecocentric thinking, a new ethic of partnership with the non-human and a new story about who we are, as a species, in relation to all other forms of life on the planet. In this unprecedented transformation, literature, film, games and art for young people are not supplementary but rather the most important avenues for

raising awareness and mobilizing social adaptation to the realities of a climate-altered world.

How we work

Although we share many of the above premises with other organizations and NGOs, we believe that the combined commitments to climate literacy, education and stories are unique to our vision – as is the realistic aspiration to reach millions of students and teachers in existing K–12 classrooms. As educational professionals, often leading teacher-education programs, we are insiders to education as a system. We have the power to change it from within by creative grassroots action with students and teachers, without waiting for change to trickle down from school boards, education departments, state or federal regulators. We propose to train teachers, within and in addition to teacher training programs; these teachers will empower their students and train other teachers too.

Toward this goal we are developing five main lines of work, each involving several projects:

- An online literature database and glossary, called Climate Lit, that features books, films, games and other narrative formats teachers can use for climate literacy instruction (https://www.climatelit.org/).
- A peer-reviewed, open access, pocket journal called *Climate Literacy in Education* (https://pubs.lib.umn.edu/index.php/cle/issue/archive). Edited by an international editorial collective, this journal publishes four types of content relevant to teaching climate literacy: lesson plans or modules, teaching reflections, critical essays and creative/multimodal work.
- Professional development, such as teacher fellowships, summer institutes, webinars and discussions, workshops, undergraduate internships and other training opportunities that build the climate literacy education community.
- Research and partnerships that connect climate literacy scholars across the world to amplify our voices at professional conferences, journals and other venues.
- Community building through outreach to teachers, educators, authors, librarians, activists, parents, schools, organizations, governments and other stakeholders to expand a global community that works toward and advocates for climate literacy education in all schools everywhere.

Will this work? I have strong reasons to believe so. As a literature scholar, teacher-educator and story systems theorist, I have seen how stories open people's eyes, and energize and inspire them. Imagine this happening in classrooms all over the world. Imagine students engaging with stories that build their emotional courage and resilience to discuss the atrocities of ecocide and stand up to it in their lives. Imagine students honing their cognitive and creative capacities to explore alternatives to how we live now and growing into climate literate adults. Imagine teachers trained and supported for climate literacy work in their everyday practice. And imagine the resources we could

build for climate literacy education by partnering with academics, publishers, authors, illustrators, artists, parents and grandparents: all of them supporting teachers with whatever is needed to expand this work in actual classrooms. This is how the climate literacy revolution can help transform the emergency we face. It all starts with stories. That become dreams. That become work. That becomes reality.

American botanist and Potawatomi author Robin Wall Kimmerer opens her book *Braiding Sweetgrass* (2013) with a two-page Native American origin story of Skywoman arriving on Earth. "Children hearing the Skywoman story from birth" Kimmerer explains, "know in their bones the responsibility that flows between humans and the earth" (5). The story "holds our beliefs, [...] our relationships," and ideas about "how we can go forward" (5): a constellation of teachings Kimmerer refers to as "the Original Instructions" (6). Our Western industrial civilization has forgotten these original instructions. Our origin story is about exile from the garden, the curse of work, alienation from other living beings, and not belonging. Only education, and only other stories can reprogram our deepest values and perceptions about our place on Earth – as individuals, as societies, and as a species. At the Center for Climate Literacy we believe that education and stories are essential to help usher in an ecological civilization. And if this goal strikes you as ridiculously ambitious, consider this: even if we fail to reach every school and every teacher, this failure is still above everyone else's success.

To learn more, or get involved, you can reach us at climatelit@umn.edu or sign up for membership at https://umn.qualtrics.com/jfe/form/SV_41JtDaZ5b3EGhNA.

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