

Transformative Education as a Catalyst for Socio-Ecological Sustainable Change

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Jamie: [Paul is about to toss a plastic bottle in the garbage] *No, no, no, no. recycle.*

Paul: *Ah... I am really losing patience with the Earth. I miss throwing things out willy nilly.*

(Mad About You, S1.E19, 1993)

In the 21st century, socio-ecological injustices continue to persist. Worst yet: they are exacerbated by the maintenance of unsustainable industrial practices, political inertia and economic structures that prioritize short-term capital gains over the long-term survival of our planet. As a result, we are currently living through an era marked by unprecedented environmental crises: climate change, loss of biodiversity, air pollution, deforestation, sea level rises, etc., which only work towards furthering social-economic inequities. In this context, there has been an increasing call by certain sectors of society – like scholars, activists, community organizations, Indigenous peoples, and concerned citizens – to urgently reevaluate the ways in which we strive for sustainability. Notably, and despite any discernible contradictions (e.g. Doerr, 2004; Reis & Guimaraes-Iosif, 2012; Stevenson, 2007), they continue to turn towards education as a catalyst for the changes we need to secure any kind of a future. Indeed, education can be a transformative force capable of providing learners with opportunities to develop their skills, critical thinking abilities, and ethical commitments, which are critical in addressing these global challenges (e.g. Monroe et al., 2017; Reis & Sandhu, 2023; Singh, Maclure & Reis, 2025).

Early research and seminal work within environmental education (e.g. Hungerford & Volk, 1990; Palmer, 1998), critical pedagogy (e.g. Freire, 1970) and sustainability education (e.g. Orr, 1992; Tilbury, 1995) have long emphasized that education must not be limited to knowledge transmission, but instead cultivate an active, engaged, and critically aware citizenry. Similarly, recent research furthers the sentiment that education is a futile exercise if it does not empower teachers and learners to analyze and confront the structural and systemic forces that contribute to social and ecological inequalities (e.g. Annan-Diab & Molinari, 2017; Rousell & Cutter-Mackenzie, 2019). Indeed, the concept of critical environmental literacy posits that fostering deep, interdisciplinary understanding of environmental issues, alongside political, economic, and ethical considerations, is essential for meaningful societal change (Stibbe, 2009; Stevenson, 2007). In addition, participatory, experiential learning models are hailed as bridges to mind the gap between knowledge and action, enabling students to engage with real-world sustainability challenges (e.g. Tilbury, 2011; Wiek et al., 2011). Despite these calls for action, challenges persist in fully integrating these transformative approaches into mainstream education (e.g. Bardecki & McCarthy, 2020).

The special edition of this journal explores the multifaceted role of education in addressing the environmental crises (specially climate change), fostering scientific literacy, and challenging dominant socio-political structures that perpetuate environmental degradation and social injustice. The articles within this volume collectively argue that education is not merely about knowledge transmission but a powerful tool for transformation, capable of fostering critical consciousness, agency, and sustainable action. They are based on presentations given by each author who were guests in a series of international symposia hosted by the University of Ottawa's Faculty of Education as part of its Year of Action on Education & Climate Action. This event aimed to solidify the commitment to a sustainable future for all, humans and non-humans, and it was inspired by ideals of a pedagogy of care (e.g. Noddings, 2017) and a pedagogy of responsibility (e.g. Martusewicz, 2018) as well as on the Association of Canadian Deans of Education's Accord on Education for a Sustainable Future, among others.

Maija Aksela opens this issue with a compelling discussion on advancing scientific literacy in climate change education through collaborative, evidence-based approaches. Aksela's work highlights the importance of fostering student agency by integrating personalized learning approaches and co-design methodologies. Her examination of the Finnish LUMA (STEM) network offers valuable insights into how interdisciplinary collaboration between scientists, educators, and communities can enhance students' understanding of climate change while instilling constructive hope for the future. By prioritizing inquiry-based and student-driven learning, Aksela's contribution exemplifies how education can serve as a catalyst for meaningful engagement with environmental challenges.

J. Lawrence Bencze's article, "Climate Wars: Pro-Ecojustice Educators vs. Pro-Capitalist Networks," provides a critical perspective on the entrenched capitalist structures that contribute to environmental and social crises. Bencze argues for a pedagogical schema that encourages students to critique the relationships between STEM and society, equipping them with the skills to develop and implement informed actions for ecojustice. His analysis underscores the importance of countering corporate and neoliberal influences on science education, advocating for educational frameworks that empower students to challenge dominant economic paradigms and advocate for systemic change.

Similarly, Richard Maclure's work, "Climate Change Denial as a Catalyst for Transformative Education," addresses the pervasive issue of climate change denial and its implications for education. Maclure emphasizes the need for transformative educational strategies that counter misinformation, foster critical thinking, and engage young learners in meaningful discussions about socio-environmental issues. By examining various iterations of denial, from outright skepticism to more insidious forms of ideological denialism, Maclure makes a compelling case for reimagining education as a space for both intellectual rigor and civic engagement.

The discussion is further enriched by the work of Alain Fopa, whose article, "Education to the Rescue of Policy Coherence: Between Environmental Issues and Development Imperatives in Africa," examines the tensions between environmental policies and economic development in African contexts. Fopa argues that

conventional awareness-raising strategies have been insufficient in reconciling these competing priorities. Instead, he proposes an education model that prioritizes conciliation, fostering policy coherence that respects local realities while addressing environmental and climate challenges. His analysis is particularly valuable in highlighting the diverse and region-specific considerations necessary for implementing effective educational reforms.

Taken together, the articles in this special edition highlight the need for a paradigm shift in education, one that moves beyond passive knowledge acquisition to active, critical engagement with pressing global challenges. Whether through the promotion of scientific literacy, the critique of capitalist dispositifs, the countering of climate change denial, or the pursuit of policy coherence, each contribution underscores education's potential to shape more just and sustainable futures, providing concrete examples and frameworks which may be applied within our schools. Such initiatives become ever more critical given the current sociopolitical dismissal of climate related issues.

We invite readers to engage with these thought-provoking discussions, reflect on their implications for educational practice and policy, and contribute to the growing movement toward transformative, justice-oriented education. Maybe one day the opening joke will be funny again, as it probably was over two decades ago.

Enjoy!

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References

- Annan-Diab, F., & Molinari, C. (2017). Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals. *The International Journal of Management Education*, 15(2), 73-83. <https://doi.org/10.1016/j.ijme.2017.03.006>
- Bardecki, M. & McCarthy, L. (2020) Implementation of the Bondar Report: A reflection on the state of environmental education in Ontario. *Canadian Journal of Environmental Education*, 23(3). pp. 113-131.
- Doerr, M. (2004). *Currere and the environmental autobiography: A phenomenological approach to the teaching of ecology*. Peter Lang.
- Freire, P. (1970). *Pedagogy of the oppressed*. Herder and Herder.
- Hungerford, H. R., & Volk, T. L. (1990). Changing learner behavior through environmental education. *The Journal of Environmental Education*, 21(3), 8-21. <https://doi.org/10.1080/00958964.1990.10753743>
- Martusewicz, R. (2018). *A pedagogy of responsibility: Wendell Berry for ecojustice education*. Routledge.
- Monroe, M. C., Plate, R., Oxarart, A., Bowers, A. W., & Chaves, W. A. (2017). Identifying effective climate change education strategies: a systematic review of the research. *Environmental Education Research*, 25(6), 791-812. <https://doi.org/10.1080/13504622.2017.1360842>
- Noddings, N. (2017). Care ethics and education. In: N. Aloni, and L. Weintrob (Eds.), *Beyond bystanders. Moral development and citizenship education*. Rotterdam: SensePublishers. https://doi.org/10.1007/978-94-6351-026-4_14
- Orr, D. W. (1992). *Ecological literacy: Education and the transition to a postmodern world*. SUNY Press.
- Palmer, J. A. (1998). *Environmental education in the 21st century: Theory, practice, progress and promise*. Routledge.
- Reis, G., & Guimaraes-Iosif, R. (2012). The death and life of a school-based environmental education and communication program in Brazil: Rethinking educational leadership and ecological learning. *Applied Environmental Education & Communication*, 11(3-4), 123-132. <https://doi.org/10.1080/1533015X.2012.776906>
- Reis, G., & Sandhu, H.K. (2023). Expanding institutionalized learning spaces in/for science teacher education: the case of a community garden in Ottawa. *Em Aberto*, 35(115), 169-182.
- Rousell, D., & Cutter-Mackenzie, A. (2019). A systematic review of climate change education: Mapping the field and new directions. *Environmental Education Research*, 25(9), 1231-1263. <https://doi.org/10.1080/13504622.2019.1644881>

- Singh, D., Maclure, R., & Reis, G. (2025). Transformative education for youth in Canada's justice system: earning credits and gaining hope. *Justice, Opportunities, and Rehabilitation*, 64(3), 197–219. <https://doi.org/10.1080/2997965X.2025.2467713>
- Stevenson, R. B. (2007). Schooling and environmental education: Contradictions in purpose and practice. *Environmental Education Research*, 13(2), 139-153. <https://doi.org/10.1080/13504620701295726>
- Stibbe, A. (2009). *The handbook of sustainability literacy: Skills for a changing world*. Green Books.
- Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education in the 1990s. *Environmental Education Research*, 1(2), 195-212. <https://doi.org/10.1080/1350462950010206>
- Tilbury, D. (2011). *Education for sustainable development: An expert review of processes and learning*. UNESCO.
- Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science*, 6(2), 203-218. <https://doi.org/10.1007/s11625-011-0132-6>