

07

ACROSS BOUNDARIES

Planetary crises transcend borders—so must education.



KEY MESSAGES

- **Planetary crises unfold through interconnected ecological, social, economic, and political systems.** Their causes and consequences cross national and institutional borders, but responsibility, vulnerability, and capacity to respond are distributed unequally.
- **Education must be organized to learn and act across borders and boundaries.** This requires connecting disciplines, sectors, institutions, generations, geographies, and human and more-than-human worlds while respecting differences and boundaries that protect sovereignty, safety, and communities' authority over their knowledge.
- **Physical and virtual mobility, exchange, and multilingual knowledge infrastructures can deepen learning and cooperation across contexts.** Yet funding, migration and visa regimes, language hierarchies, digital access, displacement, and recognition of qualifications shape who can participate and whose knowledge travels.
- **Whole-institution and networked approaches can connect curriculum, governance, operations, research, and community learning across formal, non-formal, and informal settings.** Their success depends on reciprocal partnerships and on educators having the professional autonomy, academic freedom, time, resources, and support to work across boundaries.
- **Plural knowledge systems are essential to adaptive capacity.** Bringing scientific, Indigenous, local, and experiential knowledge traditions into dialogue can reveal connections, risks, and possibilities for action that no single tradition can see alone, linking Earth-system understanding with lived realities and enabling more robust, context-responsive action across scales.

AUTHORS

Iveta Silova , Arizona State University · Victoria Desimoni , Arizona State University · Steven Hartman , UNESCO-MOST BRIDGES Coalition · Arizona State University

2026 · Version 1.0

INSIGHT

Planetary crises unfold across interconnected ecological, social, economic, and political systems. Climate disruption, ecological degradation, and social instability interact across regions, sectors, and scales, crossing political, institutional, and disciplinary boundaries and reshaping relationships between human societies and the more-than-human world (Meadows, 2008; Vossoughi et al., 2023). These dynamics do not stop at national borders or sectoral silos; disruption in one domain can reverberate through others, requiring coordinated responses across institutions and scales. The planetary boundaries framework makes the Earth-system dimensions of this challenge visible. According to the 2025 *Planetary Health Check*, seven of the nine planetary boundaries were assessed as transgressed (Sakschewski et al., 2025). These transgressions are systemic in their drivers and transboundary in their consequences, yet responsibility, vulnerability, and capacity to respond remain distributed unequally. Responding to them therefore requires forms of knowledge, learning, governance, and collective action capable of moving across the boundaries that have traditionally structured education.

Nevertheless, educational institutions and infrastructures remain fragmented along national, disciplinary, and institutional lines, often reproducing the idea that human societies exist apart from the living world. This fragmentation limits their capacity to respond to complex, systemic challenges (Sterling, 2001, 2004). To meet the planetary moment, education must become border-crossing by design, supporting learning, exchange, and cooperation across disciplinary, sectoral, geographic, political, generational, and species boundaries while recognizing that access to the sites and pathways of such crossings is profoundly unequal within and across social, political, and ecological systems.

The challenge is not only that planetary crises cross borders, but that the boundaries around which education systems have traditionally been organized do not adequately reflect the realities of an increasingly interconnected world. Educational institutions continue to separate disciplines, sectors, generations, and forms of knowledge into distinct domains, even as climate change, biodiversity loss, migration, and technological transformation unfold across them. These divisions are reinforced by reductionist assumptions that complex problems can be understood and addressed by separating them into discrete parts. As Meadows (2008) argues, the behavior of complex systems cannot be understood by examining their parts in isolation. Educational responses to planetary challenges therefore require forms of connection that:

- bring scientific, Indigenous, local, and experiential knowledge traditions into dialogue without collapsing their differences;
- connect research, policy, and practice;
- enable physical and virtual mobility, exchange, and collaborative learning; and
- recognize humanity as inseparably part of, rather than distinct from, the living systems on which societal social systems depend.

Responding to such complexity requires new forms of coordination and learning. Polycentric governance highlights the importance of distributed, interconnected decision-making across local, national, and global levels (Ostrom, 2010). Its effectiveness, however, depends on coordination, accountability, and meaningful participation by actors with unequal power and resources. Without reflexive dialogue and practices

designed to address unequal power, polycentric governance can reproduce existing inequalities and structural rigidities. Similarly, transdisciplinary approaches bring academic disciplines into collaboration with communities, practitioners, policymakers, and other social actors, connecting research, policy, and practice (Jahn et al., 2012; Klein, 2017). Without such boundary-crossing capacities, knowledge co-production, learning, and decision-making can remain disconnected, limiting their contribution to coordinated action and systemic transformation (Cash et al., 2003).

Whole-institution and networked approaches provide practical pathways for turning border-crossing principles into institutional practice. Embedding sustainability across leadership, teaching, research, operations, and institutional culture creates coherent environments for deep learning and meaningful participation (Wals et al., 2024; UNESCO, 2024). Rather than treating sustainability as a discrete topic, whole-institution approaches position it as an organizing principle that connects governance, pedagogy, infrastructure, and community engagement in mutually reinforcing ways (Sterling, 2004). Such approaches depend on the professional autonomy, academic freedom, time, resources, and institutional support that enable educators and other institutional actors to sustain collaboration across boundaries—conditions that cannot be taken for granted. When institutions operate in isolation, interconnected priorities—such as climate education, global citizenship, and digital learning—can become fragmented, competing for time and attention and reinforcing the very silos they seek to address. By contrast, cross-institutional networks and collaborative learning communities enable knowledge to circulate, reduce duplication, and support reciprocal learning and shared innovation across formal, non-formal, and informal settings.

At the same time, borders are not only institutional but epistemic and political. Dominant reductionist worldviews fragment knowledge and reinforce separation across disciplines, sectors, and species. Long-standing relational and ecological traditions of thought offer ways of knowing that connect understanding across perspectives, places, and communities (Escobar, 2018; Le Grange, 2018). Bringing scientific knowledge into dialogue with distinct Indigenous, local, and Global South knowledge traditions—without absorbing them into a single framework—can expand what counts as evidence and who counts as an educator, strengthening collective responses to uncertainty (Smith et al., 2019; de la Cadena & Blaser, 2018). This requires attention to power, authority, reciprocity, and the rights of communities and knowledge holders to determine how their knowledge is represented, shared, and used.

Digital divides, language hierarchies, unequal funding, visa and migration regimes, displacement, and uneven recognition of qualifications continue to shape who can move, participate, and be heard, as well as whose knowledge circulates and whose remains marginalized. These asymmetries reflect broader inequalities in knowledge systems and governance, underscoring the need for more equitable infrastructures for physical and virtual mobility, multilingual participation, reciprocal exchange, and recognition across contexts (Cash et al., 2003). Addressing these structural barriers is essential if border-crossing education is to widen participation rather than reproduce existing inequities. Emerging technologies, including AI, further underscore the need for equitable digital systems and governance that enable meaningful participation, plural knowledge production, and greater community agency over how data and technologies are developed and used (BRIDGES et al., 2025).

In these and other ways, education can move from fragmentation toward connection, developing as a networked, relational system capable of learning and responding across places, institutions, and scales. Such a transformation requires changing how knowledge is organized, shared, and enacted across formal, non-formal, and informal settings, as well as across institutions, sectors, and societies. It aligns with systems thinking perspectives that emphasize attending to and transforming the relationships and structures through which systems operate, rather than adjusting individual components in isolation (Meadows, 2008; Sterling, 2001).

Ultimately, border-crossing education is not simply about connecting what has been separated or eliminating meaningful differences; it is about cultivating the capacities, relationships, and infrastructures through which societies can learn, govern, and flourish together while navigating difference, inequality, and interdependence in an increasingly interconnected world.

07 Pathways for transformation

Advancing border-crossing education requires coordinated shifts in how knowledge is organized, shared, and enacted across formal, non-formal, and informal learning settings.

- 01 **Design for boundary-crossing learning.** Embed interdisciplinary, cross-sectoral, and cross-scale learning within curricula and institutional structures, enabling learners to engage with complex challenges that span disciplines, communities, and ecosystems.
- 02 **Adopt whole-institution approaches.** Align governance, pedagogy, research, operations, and community engagement in mutually reinforcing ways. Ensure that educators have the professional autonomy, academic freedom, time, resources, and institutional support needed to collaborate across boundaries.
- 03 **Build reciprocal knowledge and learning infrastructures.** Support networks, platforms, and partnerships connecting schools, universities, communities, workplaces, and policymaking spaces. Enable physical and virtual mobility, multilingual exchange, collaborative knowledge production, and continuity of learning during displacement and emergencies.
- 04 **Enable polycentric and collaborative governance.** Strengthen coordination across local, national, and global levels while addressing unequal power and ensuring that educators, learners, communities, researchers, and policymakers participate meaningfully in shared decision-making.
- 05 **Bring plural knowledge systems into dialogue.** Create conditions for scientific, Indigenous, local, and experiential knowledge traditions to inform collective learning and action without collapsing their differences, while respecting the authority of the communities and knowledge holders who sustain them.
- 06 **Address structural barriers to participation.** Confront unequal funding, digital access, language hierarchies, visa and migration restrictions, displacement, and uneven recognition of qualifications that shape who can move, participate, and be heard.

- 07 Cultivate relational and systems thinking capacities.** Support learners and educators in understanding interdependence, engaging across differences, navigating complexity and uncertainty, and acting collaboratively across places and scales.

ILLUSTRATIVE PATHWAYS IN PRACTICE

The following examples illustrate how educational transformation grows through connection. By linking communities, institutions, knowledge systems, and places, they demonstrate how crossing boundaries can expand what education is, who participates in it, and what becomes possible for planetary futures.

Ecoversities Alliance: Learning Across Boundaries

The Ecoversities Alliance is a global ecosystem of more than 400 community-rooted learning initiatives that challenges the idea that education happens primarily in schools and universities. Connecting Indigenous knowledge holders, grassroots organizations, educators, artists, farmers, and local communities across more than 40 countries, the alliance creates spaces where diverse ways of knowing can learn from one another. In doing so, Ecoversities reimagines the boundaries of education itself—where learning happens, who teaches and learns, and what forms of knowledge are valued.

Learn more

Ecoversities Alliance. (n.d.). *Ecoversities: Learners and communities reclaiming diverse knowledges, relationships, and imaginations*. <https://ecoversities.org/>

Whole-School Approaches: Reimagining the Institution

Whole-school approaches to sustainability recognize that education cannot fully prepare learners for regenerative futures if schools continue to reproduce fragmented or extractive ways of organizing learning. Across diverse contexts, schools are reimagining themselves as living learning ecosystems, connecting curriculum, governance, food systems, buildings, biodiversity, and community partnerships within a shared educational vision. Sustainability is no longer confined to the classroom but becomes embedded in how schools make decisions, steward resources, and relate to surrounding communities and ecosystems. By engaging learners, educators, leaders, and community partners, these approaches demonstrate how institutional practices can embody and reinforce the principles taught through the curriculum.

Learn more

Wals, A. E. J., Bjønness, B., Sinnes, A., & Eikeland, I. (Eds.). (2024). *Whole school approaches to sustainability: Education renewal in times of distress*. Springer. <https://doi.org/10.1007/978-3-031-56172-6>

Mathie, R. G., & Wals, A. E. J. (2022). *Whole school approaches to sustainability: Exemplary practices from around the world*. Wageningen University & Research. <https://www.wur.nl/en/education/pre-university/whole-school-approaches-sustainability-exemplary-practices-around-world>

Climate-U: Connecting Universities and Communities Across Borders

Climate-U is an international network bringing together 29 universities and other organisations across 17 countries in Africa, the Americas, Asia, Europe and the Pacific to explore how higher education can contribute to locally grounded and socially just responses to climate change. Through international dialogue, reciprocal exchange, coalition-building, and participatory action research, the initiative connects students, educators, university leaders, community organizations, local governments, and other social actors. Rather than transferring a single model across settings, participating institutions co-produce responses grounded in their own ecological, social, and institutional contexts while learning across countries and regions. Climate-U demonstrates how universities can cross disciplinary, institutional, and geographic boundaries while connecting research, teaching, community knowledge, and climate action. The network grew out of a research project that ran from 2020–2024 in Brazil, Fiji, India, Indonesia, Kenya, Tanzania and the UK, focusing on the role of universities in climate action (Climate-U 2021; Nussey et al. 2023; Rolleston et al. 2023; Sasidevan et al. 2025).

Learn more

Climate-U. (2021). *A protocol for participatory action research into climate justice: Principles and tools* (Transforming Universities for a Changing Climate Working Paper Series No. 3). Transforming Universities for a Changing Climate. https://www.climate-uni.com/_files/ugd/f81108_6267a3677e5d4cb89310044e8ac70d7c.pdf

Climate-U. (n.d.). *International network of universities for climate action*. <https://www.climate-uni.com/>

Nussey, C., Sanchez Tyson, L., Dandare, K., Perry, J., & McCowan, T. (2023). *How are universities responding to the challenges of the climate crisis? A systematic review of literature* (Transforming Universities for a Changing Climate Working Paper Series No. 14). Transforming Universities for a Changing Climate. https://www.climate-uni.com/_files/ugd/f81108_3a85740bd4cc4cb69dd9e5fddf2b87a3.pdf

Rolleston, C., Nyerere, J., Brandli, L., Lagi, R., & McCowan, T. (2023). Aiming higher? Implications for higher education of students' views on education for climate justice. *Sustainability*, 15(19), Article 14473. <https://doi.org/10.3390/su151914473>

Sasidevan, D., Santha, S., McCowan, T., & Balasubramaniam, S. (2025). Bridging the gap: Participatory action research for climate change adaptation in rural India. *International Journal of Sustainability in Higher Education*, 26(6), 1492–1511. <https://doi.org/10.1108/IJSHE-10-2024-0710>

University College London. (n.d.). *Unlocking universities' powerful climate action potential*. <https://www.ucl.ac.uk/ioe/research-projects/2023/dec/unlocking-universities-powerful-climate-action-potential>

REFERENCES

- BRIDGES. (2025). Seeding ethical AI stewardship for shared global futures: An outcome challenge of two integrated side events of the 3rd UNESCO Global Forum on the Ethics of AI 2025. <https://bridges.earth/storage/app/media/documents/Seeding-Ethical-AI-Stewardship-for-Shared-Global-Futures.pdf>
- Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., Jäger, J., & Mitchell, R. B. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences*, 100(14), 8086–8091. <https://doi.org/10.1073/pnas.1231332100>
- de la Cadena, M., & Blaser, M. (Eds.). (2018). *A world of many worlds*. Duke University Press. <https://doi.org/10.1215/9781478004318>
- Escobar, A. (2018). *Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds*. Duke University Press. <https://doi.org/10.1215/9780822371816>
- Jahn, T., Bergmann, M., & Keil, F. (2012). Transdisciplinarity: Between mainstreaming and marginalization. *Ecological Economics*, 79, 1–10. <https://doi.org/10.1016/j.ecolecon.2012.04.017>
- Klein, J. T. (2017). Typologies of interdisciplinarity: The boundary work of definition. In R. Frodeman, J. T. Klein, & R. C. S. Pacheco (Eds.), *The Oxford handbook of interdisciplinarity* (2nd ed., pp. 21–34). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780198733522.013.3>
- Le Grange, L. (2018). The notion of Ubuntu and the (post)humanist condition. In J. E. Petrovic & R. M. Mitchell (Eds.), *Indigenous philosophies of education around the world* (pp. 40–60). Routledge. <https://doi.org/10.4324/9781315173603-3>
- Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea Green Publishing.
- Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change*, 20(4), 550–557. <https://doi.org/10.1016/j.gloenvcha.2010.07.004>
- Sakschewski, B., Caesar, L., Andersen, L. S., Bechthold, M., Bergfeld, L., Beusen, A., Billing, M., Bodirsky, B. L., Botsyun, S., Dennis, D. P., Donges, J. F., Dou, X., Eriksson, A. C., Fetzer, I., Gerten, D., Häyhä, T., Hebden, S., Heckmann, T., Heilemann, A., ... Rockström, J. (2025). *Planetary health check 2025: A scientific assessment of the state of the planet*. Potsdam Institute for Climate Impact Research. <https://doi.org/10.48485/pik.2025.017>
- Smith, L. T., Tuck, E., & Yang, K. W. (Eds.). (2019). *Indigenous and decolonizing studies in education: Mapping the long view*. Routledge. <https://doi.org/10.4324/9780429505010>
- Sterling, S. (2001). *Sustainable education: Re-visioning learning and change*. Green Books for the Schumacher Society.
- Sterling, S. (2004). Higher education, sustainability, and the role of systemic learning. In P. B. Corcoran & A. E. J. Wals (Eds.), *Higher education and the challenge of sustainability* (pp. 49–70). Kluwer Academic Publishers. https://doi.org/10.1007/0-306-48515-X_5
- UNESCO. (2024). *Green school quality standard: Greening every learning environment*. <https://doi.org/10.54675/LOCX2930>
- Vossoughi, S., Marin, A., & Bang, M. (2023). Toward just and sustainable futures: Human learning and relationality within socio-ecological systems. *Review of Research in Education*, 47(1), 218–273. <https://doi.org/10.3102/0091732X231223505>
- Wals, A. E. J., Bjønness, B., Sinnes, A., & Eikeland, I. (Eds.). (2024). *Whole school approaches to sustainability: Education renewal in times of distress*. Springer. <https://doi.org/10.1007/978-3-031-56172-6>

Publication details

Suggested citation: Silova, I., Desimoni, V., & Hartman, S. (2026). Planetary crises transcend borders—so must education. In I. Silova, G. Fischman, V. Desimoni, S. Hartman, A. Weinberg, D. Anayatova, S. F. Beardmore, R. Iyengar, C. Karsgaard, K. Keena, H. Komatsu, C. Kwauk, G. M. L. Mendes, T. McCowan, D. L. Morrison, A.-L. Neurohr, & J. Rappleye (Eds.), *Key insights on education for planetary futures*. Education for Planetary Futures Collaborative, Julie Ann Wrigley Global Futures Laboratory, UNESCO-MOST BRIDGES.

Authors:

Iveta Silova, Arizona State University · <https://orcid.org/0000-0002-8897-8016>

Victoria Desimoni, Arizona State University · <https://orcid.org/0009-0006-7194-5898>

Steven Hartman, UNESCO-MOST BRIDGES Coalition · Arizona State University · <https://orcid.org/0000-0002-4474-1615>

DOI: <https://doi.org/10.14507/lfc-epf-keyinsights.07>

Online: [View this Key Insight online](#)

Contact: info@planetaryfutures.education

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0).

<https://creativecommons.org/licenses/by-sa/4.0/>
