



# Education in Times of Climate Change

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## Setting the Scene

As far back as 1992, at the very first Intergovernmental Conference on Environment and Development held in Rio de Janeiro, Brazil, the [UN Framework Convention on Climate Change](#) (UNFCCC) was adopted. It stipulated that parties should regularly meet to address climate change, specifically at the [Conference of Parties](#) (COP). In 2021, governments, scientists and policy advisers gathered at COP26 in Glasgow, UK. Here, the [Education and Environment Ministers](#) of the world recognised “the critical role played by education and learning in the transition towards a climate positive future and the urgency of embedding climate considerations into all levels of education”. They agreed “to collaborate and invest in education for a sustainable future”. Their [statement](#) entitled “Learn for the Planet, Act for the Climate” is worth considering in some detail:

*“Recalling Article 6 of the UNFCCC and Article 12 of the Paris Agreement, we welcome the adoption of the Berlin Declaration on Education for Sustainable Development as well as the Catania Declaration of G20 Ministers of Education that emphasise the importance of education to address the climate crisis and promote sustainability and the new COP26 work programme on Action for Climate Empowerment. We celebrate the organisation of the Youth4Climate event in Milan, Italy, as part of the Pre-COP, and the Mock COP26 conference in 2020 underlining youth voices and activism in the face of the climate emergency*

*We welcome the progress made in recent years to mobilise education to address climate change. However, we recognise the large remaining gaps in providing everyone with knowledge, skills, values and attitudes needed to effectively participate in the transition towards climate positive societies. Recognising that climate change and extreme weather already impact the education system in developing countries, undermining children and teachers’ safety, and access to basic education.”*

Beyond and sometimes in response to the slow pace and limited visible impact of formal intergovernmental engagements, civil society and, particularly, the youth around the world have called for stronger and more direct action to tackle the deep-seated development practices contributing to anthropogenic climate change, which is captured in the call on many protest banners, for “Systems Change, not Climate Change”.

With the case for climate change education already being made, this special issue of NORRAG addresses the question of how education can equip learners to participate in climate action that would fundamentally change problematic systems. Just how this is to be done in the context of education at all levels and in all societal contexts as learning spreads beyond the traditional “walls” in response to climate change challenges has not always been clear. The educators and facilitators of learning and the learners themselves—who occupy diverse fields and spaces—need to share a deeper analysis of climate change education and social learning, how it is experienced and what the gaps might be. Such shared meaning-making is emerging from different geographies, political economies, ecological spheres, cultures, classroom settings, social learning contexts and more. Such an analysis needs to inform pedagogical praxis, colearning, curriculum, climate action, policy formulation, the frameworks for evaluating success, resourcing decisions and what we might consider educative acts for engaging with climate change and its multidimensional uncertainties, risks and opportunities.

The contributions of this special issue are responses to exactly this call, which went out in 2020 to help us understand the contours of education in times of climate change and what policymakers need to consider to enable the kind of educational change needed. The 28 papers in this issue give voice to young scholars, early career educationists and development practitioners, as well as internationally renowned practitioners and academics who have devoted their careers to sustainability and

educational change. The 75 authors come from 22 countries and all continents, bringing voices from the Global South and North, West and East and multidimensional vantage points that nonetheless clearly converge on the matter. These researcher-educators draw on practical experiences in more than 30 projects and programmes and on diverse scholarly and theoretical traditions. They propose new ways for educators and learners to engage in and conceptualise climate change education and learning while presenting new imaginaries for framing learning and education. Beyond calls for “more resources”, they articulate what resources should be used for and why. What are young people asking for, and how should rural communities be involved? This collection of diverse works unpacks the challenges that have emerged in the past decades, brings new lenses, imaginaries and insights to them and shines a stronger, clearer and more transgressive light on the way forward.

### Special Issue Themes

Papers are clustered around eight interrelated themes that, when combined, align with the recent World ESD Conference policy call from [UNESCO \(2021\)](#): “Transformative learning for people and the planet is a necessity for our survival and that of future generations. The time to learn and act for our planet is now”.

What is distinctive, however, is that these papers each offer a unique vantage point on how such transformative learning needs to be conceptualised and established in the education system conceptualised broadly. The contributions cover various types of research, principles, sites of learning, types of learning and curricula, pedagogical innovations, teachers, children, community and young people’s voices, relations, perspectives and roles while offering metaphors and examples of transformative processes. The shared argument is that transformative processes and epistemologies are needed in education, but more than that, the arguments are made via various experiments with transformative processes.

### Overview Perspectives

The first theme of this NORRAG Special Issue presents some broad overview perspectives with international scholars and policy advisors Marcia McKenzie and Aaron Benavot making the case for better knowledge on the intended and implemented policies for climate change education and communication. They argue for policy research that compares approaches, conceptualisations and methods as an important leverage point for fostering climate change education. Writing from Mexico and Spain, Edgar González-Gaudiano and Pablo Meira present principles that should underlie policy for climate change education both inside and outside formal education systems, giving special attention to the role of the social and educational sciences which have, they argue, largely been silent on

the matter. Christina Kwauk draws on her experience in girls’ education to provide insights on education for climate justice that would tackle root drivers of the climate crisis: inequitable social structures, vested interests, and economic practices that have exceeded our ecological ceiling and social foundations; her work positions climate change education in the dialectic between such systemic structures and learner agency. From Zambia, environment and development educator Justin Lupele describes the participatory process of developing Zambia’s National Climate Change Learning Strategy, putting learning at the heart of climate change policy and strategy development.

### Expanding Learning and Agency Across Boundaries

The Education and Environment Ministers at COP26 recognized education as a “[society wide learning process](#)” that spans formal education, schooling, teacher education, other educational institutions and levels within these. They also committed themselves to “the integration of sustainability and climate change in professional training, public awareness and information activities, and other areas of non-formal and informal learning”. The second theme of this NORRAG Special Issue suggests that transgression of the boundaries between these contexts, is also important. A case study from Finland by Annelisa Sannino and Yrjö Engeström opens the theme. Their analysis reveals the importance of research into the cultural-historical roots of sustainability issues and efforts in a particular locality and of appropriate theory and educational tools to help us understand and support the learning of city collectives as they develop agency to address their climate and sustainability challenges. The second case study of organisational learning across boundaries comes from Colombia. Here, Thomas Macintyre and his colleagues worked with an organic coffee growing collective to adopt a new governance model and process that would help them take climate issues seriously and respond appropriately to them. The third paper is a contribution of Canadian Sarah van Borek, who is living and working in South Africa, where she studied a project exemplifying a “hybrid of formal and informal learning”. In recognition of the impact of colonialism into the present day, on our ability to fully understand and respond to climate injustices, knowledge keepers from the margins of mainstream society are given a central place in university and broader education programmes, which is an example of “decolonized climate change education”.

### Transformative Learning, Activism and Relations

There is common agreement on the importance of new knowledge, as contributed by scientists and others understanding climate change and its impacts. However, educational processes that only raise awareness and address the cognitive domain, focusing predominantly on a cognitive-technical understanding and the immensity

of the risk, are not adequate. In fact, problem-oriented education can have negative psychological impacts on learners (see [Hoffman, 2021](#)). Emotions are an important dimension of climate change education, given both the risk of anxiety, depression and resultant apathy among learners, and the importance of positive emotions to energise action. This is an underexplored aspect of education, and the four papers in this theme address this gap.

Art engages the emotions of both the artists and their audience and can express deeper and different understandings of climate change issues. Drawing on the arts as part of a transformative public conversation engaging diverse ways of knowing is the purpose of the Living Libraries project in Sweden. Authors Laila Mendy, Isabel Baudish and Stefania Barca highlight a range of challenges that emerge from such innovations. How to facilitate and bound these brave conversations, how to deal with the many uncertainties that arise and how to even set them up the first place are important practical, conceptual, political-ideological and relational considerations. Taryn Perreira-Kaplan and Dylan McGarry's paper starts to provide some answers to the challenges the Swedish authors highlight; they describe methodologies for empathically engaging stakeholders in sustainability conversations with policy intent, which is explored in a multiyear socioecological justice programme on the South African coastline. The importance of giving time and attention to net-work, building solidarity and relationships, becomes evident.

Also highlighting the importance of relationships is the multi-author paper led by Elizabeth Barratt Hacking from the UK. This contribution explores why nature experiences and an exploration of humankind's kinship with the natural world should be a fundamental part of climate change education. Nature-immersive experiences are complemented with reflection that encourages learners to recognise that after all, we are one with nature, even if our thinking, technologies and actions at times lead us to forget this.

Laura Bello Benavides describes the popular educational methodology of project work and its practical application in a technical high school in Mexico. Through an exploration of global knowledge and local issues, learners choose an issue they wish to work on and collectively come up with solutions that they then try out. What is particularly innovative in this case example is that the ensuing projects are an integral part of the school curriculum—across subjects—and that disciplinary knowledge also features strongly in the search for solutions. The diverse knowledges for eco-citizenship that they put forward is both “traditional and scientific”, which leads into the next theme.

### **Engaging Diverse Knowledges in Climate Change Response**

Across the Special Issue is a commitment and concern for diversifying knowledge in climate change responses. In this theme, the authors offer interesting vantage points on this crucial question. Lurio University in rural Mozambique requires all undergraduate students to undertake a study-stay in the surrounding communities to experience the daily routine of small-scale farmers and co-construct sustainable farming knowledge with them; author Adriano Felix explores this model for its potential to improve agricultural sustainability in Sub-Saharan African under changing climate conditions. In their contribution, Du Toit, Pollard, Chikunda and Ison analyse a series of implemented climate change education interventions in Sub-Saharan Africa, from which they identify key principles to codesigning such interventions with local stakeholders; co-constructing new and locally relevant knowledge with them and bringing in flexibility. It would seem that climate change education policy cannot prescribe a blueprint or one-size-fits-all solution, but nonetheless, it needs to capture the key principles these authors identified through their years of development, research and capacity building in the field in regions desperately affected by increasingly extreme droughts and floods. Juan Carlos Sandoval Rivera and his coauthors from Mexico propose how we need to rethink the engagement between schools and communities, mobilising diverse forms of knowledge and experience in creating participatory policy for climate change education in schools.

### **Young People and the Call for Climate Action**

As outlined above, young people are calling for climate action. In this theme, Nokuthula Daweti and fellow collaborators pierce through the conventional logics of perfunctory awareness and behavioural change objectives of climate change education. Instead, they ask for regenerative youth futures to be constituted as a response to systemic alienation from environments via years of violently disruptive colonial histories. Regenerative futures in a South African context, they argue, must be imbued with and born from within African concepts, histories, intergenerational learning(s), cognitive justice and more. Ole Andreas Kvamme and colleagues, here writing from Europe, engage with the meaning(s) for climate change education embedded in the recent school climate strikes. The message from both South Africa and Europe's young people is clear: climate change education is not just a “content issue”. Their point is that the same students that are striking against a world at risk are equally embedded in it, which calls for education that is transgressive, disruptive and oriented towards the common good. In another South African context, this time in the City of Johannesburg, Coleen Vogel and a team of youth activists argue for direct voices and contributions in the formation of policy. They want to “write directly” into climate policy, showing urgency and willingness in cocreating regenerative futures among young people.

### Children's Voices in Climate Action

As in the previous theme, the authors in this section provide impassioned perspectives on the urgency of taking the time to support and listen to children and, through this, letting their voice, political and ethical agency flourish. The authors all speak to children's experiences in the world, as well as their political and moral authorship and agency. They all argue that for too long, these have been silenced in education systems and approaches the world over. The authors are, however, not naïve in their call for giving children voice; instead, they are sensitively engaged in what this means. For example, Karin Sporre and Christina Ostbeck explain how to recognise children's moral authorship while avoiding moral indoctrination or falsely constituted normative guidance. Irida Tsevereni and her colleagues urge educators to halt the ongoing alienation from nature, offering simple yet powerful insights as to how children's experience of weather can open up transdisciplinary, ecocentric pathways in education. The paper by Anna James and Nanna Jordt Jørgensen argues for place-based and open-ended educational experiences for young children. They call for a "reconfiguration of educational cultures" that sensitively and with care "cultivate and affirm children's political agency".

### Transforming Higher Education for Sustainable Futures

Several earlier papers in the Special Issue highlight dimensions of how schools, universities and technical institutions should prepare learners for living with climate change and participating in climate change action to slow down global warming and transition away from the systems that have led to and lock us into anthropogenic climate change and climate injustices. A clear understanding of how institutions need to change is vital for policy guidelines. However, author contributions also make it clear that policy is needed at multiple levels, and intrainstitutional policy development is as important as national guidelines and international agreements. One area of emphasis is higher education because higher education often holds power and sway in framing educational transformations in various ways.

Swedish authors John Holmberg and Johan Holmén argue for a new approach towards leadership in higher education to make new policy and practice possible; they argue that universities need stability and transformative change, which encourage leaders to engage in both a "cruise" and "expedition" mode to explore transformations to the entire system: the university and its multiple stakeholders including industry, as well as its own campus management and sustainability practices, a point that is relevant to all education institutions in transitions to climate resilience. Luciana Brandii and colleagues from Brazil point to the importance of adopting diverse strategies in making these transitions, highlighting that where policy is not conducive for making transformations in response to climate change,

communities of practice with a shared interest across institutions can "make a start", which can lead in climate change education transformations. In other contexts, such as West Bengal in India, more enabling national policy provides direction for catalysing innovations. Collectively, the authors in this section of the Special Issue point out that leadership, practice and policy can all be mobilised in driving educational institutions' transformations. In Malaysia, Zainal Sanusi and Dzul Razak argue for strategic curriculum transformations, or those leading courses that can drive movements for change in higher education institutions.

### Inclusive, Responsive Educational Transformations in Service of Sustainable Futures

The last theme in this Special Issue focuses on the need to pay renewed attention to inclusive and responsive educational transformations in response to climate change in the service of sustainable futures. Nthali Silo and her colleagues at the University of Botswana indicate how, over many years of engaging with teacher education institutions and schools, change projects have emerged that are inclusive of students, teachers, children and communities, and how these are responding to the real needs experienced by communities. Ying-Syuan Huang and her coauthors discuss teacher education institutions as innovation brokers, linking teachers and communities in sustainability innovations, while Sydney Muhangi and his coauthors from Uganda consider a reconfiguration of TVET to be more inclusive of both formal and informal learning. Christelle Cazabat highlights the need to give more attention to the challenges of climate-related displacement. Children miss school when rivers flood, buildings collapse, wildfires rage and temperatures soar. As the Education and Environment Ministers at COP26 have recognized, "climate change and extreme weather already impact the education system ... undermining children and teachers' safety, and access to basic education". Nowhere is this more evident than in the migrations and displacements caused by prolonged droughts and collapse of traditional livelihoods. Cazabat explains that migration is not an isolated instance, but rather, it is a part of life, affecting large parts of the world, both North and South. Educational policy and planners need to recognise the precariousness of educational futures due to climate change and provide new solutions. It is a theme explored elsewhere in this journal and a vital reason why society has been called upon to radically rethink the nature of not only schooling, but education as a whole.

### In Conclusion

Over the course of two years and drawing on the inputs of over a million people, an [International Commission](#) under the leadership of the President of Ethiopia, President Sahle-Work Zewde, prepared a global report on exactly this vital societal question. The result, UNESCO's (2022) report [Re-imagining our Futures Together: A new Social Contract for Education](#),

calls for a new social contract to reimagine education for the common good, as a common good. This report adds to the voices in the current volume that are demanding new ways to look at, think about, approach and configure education and learning; ways that respond to realities such as climate change fallout, displacement and global migrations to the days and weeks when accessing the conventional classroom is just not possible because of extreme weather impacts.

This Special Issue demonstrates that new, positive practices are already emerging: community members join university classes not only as learners, but as sources of vital knowledge; students spend time in communities to learn. Collaborative projects addressing real local issues identified by learners themselves become integral across the curriculum. Art, activism and Indigenous knowledges challenge and advance academic understanding. New organisational forms and leadership styles are being explored. Intersections of coloniality, gender, economic and other inequalities are exposed and alternatives are being actively explored.

Of course, there is always more that could have been included in a Special Issue such as this. For example, more could have been said about integrating actual sustainability practices in whole institution development because this models sustainability praxis for learners, teachers and communities; this is a topic well covered in a recent book on [Green Schools Globally](#) (Gough et al., 2020). More research on the comparative models of climate change education is in development in the global [Monitoring and Evaluation of Climate Change Communication and Education Project](#), producing [country profiles](#) and a global peer review mechanism informing UNESCO Global Monitoring and Evaluation reporting on education. More could also have been said about the complexities of policy transformation processes, which have been deliberated on in a recent Special Issue of the [Environmental Education Research Journal](#) (Rickinson & McKenzie, 2021). All of these dynamics of this moving field ultimately depend on transformative, transgressive learning processes and relations (cf. Lotz-Sisitka et al., 2015), such as those that have been uncovered and articulated in this Special Issue.

Anthropogenic climate change is a slow crisis that has been creeping up on Planet Earth over decades. However, at this time, there is a new awareness and unprecedented commitment to make the changes needed. It is a moment not to be wasted. Answers are emerging. Policymakers need to engage, see and listen to educators who are developing emerging solutions and recommendations for policy shifts. The idea of a policy blueprint for all and for always should be abandoned. What is needed instead, as shown in this Special Issue, is policy that is a learning process in and of itself; that is formulated and implemented with input from scholars,

practitioners and youth; and that is open to ongoing reflexive revisioning as we monitor, reflect on and learn from our actions. With its 28 analyses of over 30 projects, by 75 authors from 22 countries, this Special Issue presents an outstanding example of evaluative “learning in and from climate action”.

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