Constellations of Hope

Cases and Perspectives of Transformative Learning

Editors
Carlos Álvarez Pereira,
Mario Salomone and Raad Sharar



A report to the Club of Rome

Globethics

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No Limits to Hope is a global initiative launched by The Fifth Element programme of the Club of Rome and the WEEC Network to inspire educators, learners and citizens to pursue a fundamental shift in how humanity learns — bridging the gap between knowledge and action, and reimagining what a good life and a fair future might look like. Constellations of Hope is its first publication.

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Preface

From The Limits to Growth to Constellations of Hope

Anne Snick and Gianfranco Bologna

Is it naive to start an initiative with the title *No Limits to Hope* at a time when humanity's future, even its very survival, is uncertain?

The world is living through a period of profound darkness of reason, with political leaders displaying autocratic, sovereigntist and racist attitudes that undermine fundamental rights and threaten the civilised, peaceful coexistence of peoples, which depend on international law, respect for human and more-than-human life, acceptance of diversity and care for the environment.

Humanity numbers over 8.2 billion individuals and is marked by dramatic inequality: there are more than 3,000 billionaires with a wealth of US$18.3 trillion, while almost half of the world's population lives in poverty. The 12 richest individuals own more than the entire poor half of humanity.

In recent decades, our collective knowledge has been enriched by the extraordinary insights of Earth system sciences; they analyse the interconnections between all planetary spheres to define safe and just Earth system boundaries. However, autocrats and populists attack the scientific foundations of sustainability and flood the public sphere with misinformation.

The health of the planet's natural systems is in critical condition: we have altered 75% of terrestrial ecosystems and 66% of ocean ecosystems, with these figures expected to reach 90% by 2050. At least one million species are considered in danger of extinction.

This era simply has no precedent in recorded history. Humanity has entered uncharted territory, an area that on medieval world maps was labelled "Here Be Dragons." But let's face it: we knew this was coming.

In 1968, a deeply humanistic and visionary figure, Aurelio Peccei (1908–1984), economist and business executive, founded the Club of Rome in collaboration with Alexander King (1909–2007), chemist and scientific director of the Organisation for Economic Co-operation and Development, and several other personalities united

by their interest in building a fair, just and sustainable future for humanity. Over the years, the organisation has published many fundamental reflections and proposals.

Peccei wondered how much our technical capabilities had transformed us into "brilliant monsters" who could become victims of our own actions. The organisation's initial focus was on exploring the limits of the continuous material and quantitative growth of the human species on Earth.

The first report to the Club of Rome, entitled *The Limits to Growth* (1972), was edited by a team within the System Dynamics Group at the prestigious Massachusetts Institute of Technology. It demonstrated that our species' continuous material expansion on a planet with clear geophysical limits was impossible. It warned of the potential collapse of human civilisations due to resource depletion and pollution. The reports that followed highlighted external limits to human development. Millions of copies were sold worldwide. The warning was out.

Despite these warnings, humanity stayed its disastrous course. Scientific reports on planetary boundaries clearly do not tell us how to adjust our values and behaviour in order to return to a way of life that operates within safe and just boundaries. That calls for a different approach to learning.

Peccei always emphasised the importance of analysing not only the external limits to human development but also, and above all, our internal limits. In all his publications since his first book, *The Chasm Ahead*, he maintained that everything humanity made available to itself economically and technologically did not solve the difficulties it faces because these efforts have been inspired by the same mentality that lies at the root of the crises we face. In fact, we seek paths towards progress, wellbeing and salvation mainly outside ourselves rather than in improving who we are, how we think and act, and how we learn. Modern humans are capable of transforming everything but forget to develop themselves.

Then, in 1977, the report *Goals for Humanity* was published. It aimed to create a new Renaissance, establishing a solid understanding of the humanistic component in the global functioning of the world. It envisaged a sort of 'world solidarity revolution', rooted in the conviction that the conditions for progress can be achieved through the creation of true community, a harmonious blend of complementary objectives.

The report *No Limits to Learning*, published in 1979, aimed at creating the foundations for a different world and greatly enriched the organisation's commitment by expanding the breadth of its reflections. It highlighted the need to bridge the 'human gap', the disparity between our ability to transform reality and our understanding

of the consequences. It argued that accepting the limits to growth while eliminating all limits to learning is essential.

As Peccei repeatedly emphasised, in order to learn how to govern the increasingly complex and interconnected conglomerate of societies and systems that constitute our world, we must first learn to govern ourselves. This fundamental and indispensable learning calls for a profound cultural evolution.

Can we trust our ability to achieve this in time?

It is clear that to bridge the 'human gap' and restore our lifeline with Earth, we must change how we learn. The modern educational system took shape during the industrial revolution, when schools were conceived as institutions designed to instil in children the abilities and attitudes needed to become productive workers.

Education today mostly focuses on transmitting knowledge and skills that empower humans to subjugate nature and boost economic productivity, while sidelining creativity, playfulness, spirituality and humility. It treats traditional and Indigenous worldviews and practices that approach nature with respect, restraint and reciprocity as primitive and underdeveloped. It fuels the industry's drive to exploit natural and human resources without understanding the consequences this has for quality of life. By glorifying our unprecedented power to master nature, it unravels our lifeline with Earth. It makes us oblivious to the fact that we are nature, a product of natural evolution, and that without a healthy, vital and resilient planet, we cannot breathe, drink or eat.

In order to realign our cultural and economic routines with the Earth's carrying capacity, we must reconnect deeply with nature, a task for which our schools unfortunately were not designed.

Still, there is hope.

In 2025, The Fifth Element programme of the Club of Rome and the World Environmental Education Congress Network launched No Limits to Hope, a global initiative seeking to re-examine humanity's quest for meaning and a good life. They invited learners, educators, practitioners and researchers exploring new pedagogical visions, collaborative learning and innovative problem-solving methods to share their insights. This book reveals the wealth of responses this yielded. It covers the various axes that must be recalibrated for a systemic transformation of education. It sheds light on personal journeys towards transformation and ways to open mindsets, reveals how to learn from grassroots communities, explains how to redraw the playing field in educational institutions and helps to grasp the bigger picture of a paradigm shift.

It shows how pioneers worldwide facilitate transformative learning and catalyse cultural change.

Humanity currently stands at a bifurcation where two paths diverge. Admittedly, the dead-end path of established educational regimes is far from abandoned. Yet, a true community of learners and educators is building a brighter trajectory. No well-trodden path leads to a new destination but, as the poet Antonio Machado said, 'The path is made by walking'. Travelling this new path together is our only hope, a hope with no limits.

This book is the outstanding result of a collective effort. The countless builders of new roads to a hopeful future deserve our deepest recognition. We owe a debt of gratitude to Indigenous Peoples, keepers of traditional wisdom, local communities, grassroots movements, creative young people who are embracing new values, and the courageous teachers and leaders abandoning the beaten path in search of methods to reconnect humanity with nature. They find new meaning in our co-evolution with other species and help us to envision a radically different future. We acknowledge the invaluable role of the Club of Rome, The Fifth Element, the World Environmental Education Congress Network; their close working ecosystems; and the numerous partners and institutions in making this project happen.

Hope means learning how to build regenerative futures together. Precisely because the future is unpredictable, we can imagine and nurture it and make it flourish. This vital and essential effort has to be a collective one, involving billions of people. Therefore, creating a global community of learners and educators is key. This book is testimony to the emergence of this community. It depicts alternative visions of learning that spark our creativity and free us from obsolete pedagogical mindsets. Promoting human development today means joining this movement and embedding it in new institutions, policies and regulations.

Building on the rich heritage of previous documents and reports, *Constellations of Hope* nurtures this collective ambition. At this decisive historical time, mustering the courage to support life-oriented utopias is our only way to be truly realistic. This book invites learners and teachers, communities and decision-makers to join this wave of hope heralding a shift in the educational paradigm. The choice between stifling or nurturing that hope is now yours.

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Introduction

Carlos Álvarez Pereira, Mario Salomone and Raad Sharar

Dear reader, this publication is the first book of an ambitious initiative that we decided to call No Limits to Hope. The idea that hope could be unlimited might sound naïve. But it is, instead, a hypothesis that the contents of this book confirm. To start with, hope is not an optimistic and passive feeling. It is an intentional call to action, an attempt at creating positive change.

As one of the contributors of this book says,[1] *hope emerges not as reassurance, but as a lived educational practice grounded in connection, care and shared responsibility.* This sentence synthesises almost everything that we need for our way forward. It identifies hope as a practice that does not only make our actions meaningful. Hope is an essential instrument for interacting with the future. It frees us from being passive receivers of change to anticipating it and participating in shaping it.

From hope to learning, from learning to hope

The evolution of life on Earth made us capable of imagination, which we constantly use to organise our daily endeavours and to wonder about the future. And for those of you with children, you would agree that there is nothing more relevant, nothing else for which you would be ready to pay the highest price, than the future of your kids. In many countries, millions of people sense that the lives of their children will be worse than their own. This is not a universal sentiment, but it is widespread enough in the so-called developed societies as to be deeply disturbing.

Back in the 1970s, the Club of Rome was among the early explorers asking some uncomfortable questions about the future. Is development for all humans on Earth achievable given the planet's finite resources? The first report to the Club of Rome, *The Limits to Growth* (1972), explored that question. It had a huge impact you can still feel today, and at the same time, it was deliberately misinterpreted as a doomsday prophecy. For sure, the book warned that "progress," as it was conceived then

1 The texts in italics are literal quotes from the contributions included in the book. All authors deserve to be quoted, but that would have made the introduction too long, and given the truly collective nature of the work, we decided not attribute authorship to these quotes.

and still today, could lead to the collapse of human civilisations due to the combined exhaustion of natural resources and accumulation of waste and pollution. This created a shock that we have not yet been able to respond to. The book, however, contained no prophecies at all but a multiplicity of scenarios, and in substance and spirit, it was also an invitation to learn how to make possible the balance of human and planetary wellbeing.

Having become aware of the impending civilisational threats, in 1979, the Club of Rome proposed an original formulation to address the challenge: in the report *No Limits to Learning*, it advocated for realising the full potential of humans to learn and with it to "bridge the human gap," i.e. the difference between our capacity to act and transform the reality we live in and our capacity to understand and deal with the consequences of our actions.

The "human gap" happens *between knowledge and action, between what we know and how we live.* It is a descriptive manner of invoking something terrible, which was already outlined in *The Limits to Growth*: not only could progress lead to collapse but human intelligence itself could be guilty for the suicide of the species. For all our incredible capacities, are we going to act so foolishly that life on Earth only becomes possible without us?

No Limits to Learning explicitly criticised educational institutions, where a big part of learning happens, for being only able to provide "maintenance learning," the transmission of previously validated knowledge, to the next generation of students. While necessary, maintenance learning is insufficient, as it cannot anticipate in advance what is needed as society evolves within its own ecosystem. It therefore cannot prevent the catastrophes that the violence of modernity incubates. We would then be condemned to cycles of gradual evolution punctuated by moments of tragic crises, potentially of existential calibre, which we could have prevented had we been using our capacities and wisdom better.

But *No Limits to Learning* provided more than critical diagnosis. As the present book does, it made a bet on the humanity and on the capacity of everybody to liberate their potential to learn by themselves, provided the appropriate conditions exist. It proposed that learning could actually be anticipatory, participatory, integrative and innovative. In the emergence of those new characteristics, as exemplified by the stories of this book, we find the space where hope and learning get connected.

This way of making sense of our humanity is inherited from the vision of pedagogical schools initiated more than a century ago, and it reconnects with much older schools of wisdom from Indigenous cultures and ancient civilisations. At the

same time, when we started this initiative our conviction was that the virtuous circle of learning and hope is real and is happening today. It does not lie in remote history. It is alive all around us but rarely has the appropriate visibility. This is why we issued a call for contributions in 2025, and we received many texts reflecting a multitude of experiences, inquiries, concepts and proposals from around the world.

It was hard to make the selection that is in your hands now. May your reading be useful, intriguing, refreshing, revealing and inspiring. The stories in this book come from 90 authors based in 25 different countries from the five continents. They bring the voices and experiences of tens of thousands of people: learners, teachers, practitioners, activists — many of whom participated online places too numerous to count.

How can we learn what we already know? How can we use what we know about how life works to change our relationships with all living beings and make possible the aspiration to wellbeing for all humanity and the planet? Is the capacity of humanity to learn, at individual, social and global levels, able to address the existential challenges we face? These are the big questions of our time.

Based on the testimonies of the contributors to this book, we can confirm that new learning practices and theories have indeed emerged to address those questions. They have done so in an organic way, which involves uncertainty. And that is okay, because what is most important is that these practices are alive! As you will realise, *ecocultures of an early post-Anthropocene are traceable all over the world, challenging the fossil fuel era´s remnants by reconnecting humans and Earth and by understanding the constructed nature of worldviews.*

The vectors of hope

As the attitude making transformation possible, hope needs to be integrated, not as a passive sentiment but as an active, empowering tool for navigating uncertainty and shaping sustainable futures.

The future is yet to be created. Crises open up the space of possibility, since continuing in the same way as before the crisis becomes too difficult. Different paths can emerge from critical points, and while not all of them are good, our actions can make the difference by creating the appropriate conditions for desirable futures. The whole content of this book expresses this idea in multiple ways. Once and again, it invokes the power of imagination, creativity and the arts to give birth to a variety of possible futures. At the same time, not any future is possible. How do we individually and collectively deal with challenges that feel overwhelming?

From tragedy to meaning. Our greatest challenge is not climate change, biodiversity loss, geopolitical tensions or polarisation, but the widespread illusion of our own insignificance. Feelings of meaninglessness, hopelessness and apathy are among the underlying causes, fuelling a vicious cycle of deteriorating individual, collective and planetary wellbeing. The unheard and widespread cry for meaning is also the expression of a massive claim for human dignity and fairness. What we know for sure is that, together with love and work, turning tragedy into triumph can become a strong driver of meaning.

So, we could ask: What is your sustainability story? What moments have shifted how you see the world? And how might sharing such stories become a practice of hope that invites others to join the long, necessary work of reshaping the present and future?

Emotions are intelligence. Emotional responses often trigger a desire to learn more, to question deeply, or to change something in how we live or work. As is shown many times in this book, the illusion of a "rational" intelligence segregated from our emotions was civilisationally misguided Emotions are an integral part of who we are, and ignoring them leads to unhealthy experiences of frustration, fear and humiliation. We need spaces in which emotions are not seen as distractions but as guideposts, in which contradictions are not silenced but explored, in which the goal is not clarity, but depth.

You already are a capable learner. Knowledge arises through relationship: with land, kin, ancestors and more-than-human beings. Learning is not about mastery but attunement: it is becoming-with the world. Mainstream education is not designed for this, and it transmits the idea that learning is only for a certain period of our lives or for limited circles of specialists. On the contrary, it is for and by everybody, all the time. Learning, in its fullest sense, is not merely a technical process of information transfer, but an ontological unfolding: a transformation in how we relate to ourselves, others and the living world. Learning is emergent, situated and participatory.

Learning from life. You will also read many times here how critical it is to reconnect with our own humanity, with nature and with the places where we live. The aim is to regenerate education through a living-systems approach to place, process and partnership. The "transformation space" is not a separate realm. In a way, it simply represents life itself. It is where human experience unfolds in all its complexity, through everyday moments, encounters, learning settings and the ordinary flow of time.

Life is a mystery greater than us, and at the same time, we have accumulated about it a vast amount of knowledge and wisdom that we are mostly not using for modern societal arrangements. We bet there is a space for generative inquiry at the point of junction between some parts of modern science (such as evolutionary biology, thermodynamics, ecology, cybernetics, complexity theory and others) and substantial knowledge and wisdom coming from traditional cultures, which are being rediscovered and validated by today's scientific research.

We expect to learn how living beings and ecosystems can learn and change in a process of transformation that is always mutual and never works in isolation. We humans have our ways of designing intentional change with a rationalistic, linear mindset, which is helpful for many purposes. But those ways are laden with the "human gap"; they are not fit for a systemic change. When we are an active part of the system, we intend to change. Most often, forcing change in a specific direction is ineffective when what is required is to create the conditions for learning and change to happen organically.

Health and wellbeing are relational. And they do not need ever-increasing levels of material consumption. The obsession of modernity with the maximisation of production and consumption and the individualistic conception of society have together led us to ignore that our health and sense of a meaningful life are not driven by buying things. Science has rediscovered what we have known since the beginning of times: the quality of our relationships with others, humans and non-humans, is the secret to a good life.

This crucial knowledge leads to other ways of learning and innovating, in which relationships and interdependencies play the dominant role. And it is basically good news since everyone can develop relationships. As you will read here, this ancient wisdom reconciles leading-edge knowledge with real-life practices, particularly those of the most vulnerable communities in critical situations.

Modes and levels of learning

No Limits to Learning made the bet on the human capacity to develop **new learning modes, weaving anticipation, participation, integration and innovation altogether.** These combined characteristics make a big difference, compared to maintenance learning. You will see all of them at work in the concrete experiences described in this book.

The necessity of a paradigm shift is often invoked, but what does it mean exactly? In our view, this relates to the level of depth at which learning must happen. To make

the point clear, let us consider climate change. Identifying fossil fuels as the key driver made it possible to frame both the issue and the solution in a simple cause-and-effect logic: by shifting to renewable energies, the issue is solved! The required level of learning corresponds to a techno-economic challenge, which can be met when we invest in the resources needed to develop the appropriate technologies.

There is no question, then, of what kind or how much energy do we need or of the huge imbalance in consumption between high-income and low-income countries. The trajectory for human wellbeing is assumed to require an ever-growing amount of energy per capita. It is also assumed that outrageously high levels of energy consumption are legitimate, provided there is money to pay for them.

But for all the merits of renewable energies, they do not allow for infinite growth on a finite planet. If we tie our future to growing levels of energy consumption, humanity is reduced to its metabolism: consumption becomes an end, and growth per se is given a positive meaning. This is how modernity has been working, but it is not how nature works. The idea that human wellbeing for all could be achieved with a dramatic reduction in the total consumption of energy is simply unthinkable within this framework. Too many stakes (financial, industrial, geopolitical) would be at risk. But at a different depth of learning, other formulations could be tried for this fundamental challenge. We could realise that human health and wellbeing are driven by the quality of our relationships, and this would lead to other learnings regarding our need for energy.

Institutional frameworks, including the disciplines of research, are designed to learn at certain levels but not at the depth required for our existential challenges. As described in this book, what we face *is not only a techno-scientific empirical issue but a deeply relational and structural challenge, requiring disruption of both exclusionary norms and hierarchical knowledge systems*.

The structure of the chapters in this book emerged by grouping the contents we received in response to our call for contributions in 2025. They address different manners of **enabling learning at the level of depth required**. And beyond reflecting on how existing institutions constrain that depth, concrete remedies are proposed. To facilitate the reading and what comes after, detailed introductions to the different chapters have been included. They provide a framing perspective, connecting the contributing stories in their large diversity with the overall logic of this book and of the No Limits to Hope initiative.

Chapter 1 addresses experiences of learning closest to real places and within communities, most often out of educational institutions. This is the grounding for everything else since, in local contexts, attuning to nature appears as the obvious path, and communal capacities provide knowledge and meaning at the same time. As with the rest of chapters, some shared conclusions emerge from the rich diversity of cases: learning is place-based; it is intergenerational rather than vertical; it is participatory rather than delivered; it is enriched by integrating non-Western and Indigenous epistemologies as foundational elements; and it takes the ecological and social dimensions of regeneration as inseparable. Furthermore, it becomes clear that regenerative learning requires a reorientation of epistemology, a new conception of the roles of teacher and learner and a new vision of the purpose of learning.

Chapter 2 moves into educational institutions and a variety of attempts at bringing in socio-ecological awareness, expertise and even wisdom to learners in different contexts and across a wide range of ages, from elementary schools to higher education. While education theorists and global policy frameworks have been recommending transformative change in educational institutions for decades, the gap between policy recommendations and actual classroom and institutional practice persists. And yet, the stories in this chapter show that ordinary institutions, working within the constraints of their own contexts, can actually embody the transformation without waiting for the perfect policy environment to make possible what they sense is needed.

Chapter 3 starts from the realisation that *what is needed to imagine and design regenerative futures in a learning context is far from obvious*. Substantial exploration is required, highlighting the value of imagination, creativity, design and even spirituality. Cross-cultural pedagogies and artistic expressions combined with scientific knowledge are among the paths to open our minds, building on a wholly embodied, embedded and integrative approach to intelligence. The stories in this chapter show that the "human gap" is not primarily cognitive. It is affective, relational, imaginative and spiritual. And hence, if the obstacle to transformation is not a lack of knowledge but a poverty of imagination, a disconnection from meaning and a learnt helplessness in the face of complexity, then education has far more to offer than it has so far been asked to give. The question shifts from what students need to know to who they need to become and how they need to feel.

Finally, **Chapter 4** proposes comprehensive frameworks for what Aurelio Peccei and Daisaku Ikeda called the *human revolution*, a liberation of mindsets from the usual cognitive frames that would make possible the reconciliation of humanity with the Earth. There is not just one approach to that, of course, and the richness

of proposals paves the way for further research and practice. What holds these contributions together is a shared refusal to accept that education's deepest purpose is the reproduction of the world as it is. Hope, in this framing, is also a commitment to keep the future open.

Between chapters, in **Interlude: Bridging Feeling and Sense-making**, we highlight the detailed and thoughtful exploration of an individual process of transformation towards a deep commitment to sustainability, which can be greatly helpful not as a model but as the kind of reflective story that moves us to change.

Importantly, at a time when the obsession with so-called artificial intelligence is capturing headlines everywhere, our perspective does not make the evolution of education and learning depend on technology, no matter how smart it may be. With its current framing, it is not a response to existential threats; rather, it accelerates them. Without ignoring nor discarding its potential if repurposed (as is also addressed here), our perspective starts with the imperative to rehumanise and reconnect with life. This is evident in every contribution you will read. And as you will see, it can be practised in many ways, shifting our approach to learning *from connected parts to nested wholes, from project-focused to place-oriented learning and from problem-solving to potential activation.*

Exiting self-fulfilling prophecies

Nowadays, perceptions of the future can differ greatly, depending on circumstances. For billions of people, particularly in Asia but also on other continents, the momentum of societal change provides some confidence about a better future. China has multiplied its GDP per capita by 65 in 40 years, a trajectory without any precedent in the history of humankind. This indicates that economic development could be within reach for the world majority, who have been left behind by centuries of modernity and colonisation. Even more, by adopting the goal of becoming an "ecological civilisation," the explicit aspiration of China is to make welfare for its citizens compatible with the health of the ecosystem.

At the same time, in the Western countries, which were supposed to be the bedrock of stable institutions and culture, the idea of civilisational progress seems to be receding, as if all sense that science, technology, education and democracy could realise the betterment of humanity had been abandoned. What is left, following the news in North America and Europe, is an exhibition of all kinds of fears, expressed in domestic and international fractures, confrontation and warmongering, racism and exclusion — and even genocide practised in the name of civilisation.

In short, it looks like the West is perplexed and afraid of the future. It is reacting by closing its borders and practising wide-scale violence, especially against other countries and peoples but also against its own citizens. In so doing, it is breaking the foundations of what it defined as "progress" and "civilisation" and flirting dangerously with worldwide nuclear confrontation. The obvious parallels with 1930s and 1940s Europe are, of course, not reassuring.

The way we frame the unfolding of a crisis and the meanings we associate with it are not neutral: if constrained by fear rather than hope, our capacity for collective decision-making will be limited and may accelerate the conditions that created the crisis in the first place. This resonates with the tragedies of ancient Greek traditions, in which the protagonist, by reacting fearfully to a fateful oracle, facilitates the conditions for the tragedy. Is this not exactly what happens now when we hear "leaders" and so many "experts" claiming to be better equipped for violence and war than cultivating peace?

In the late 1960s, the Black Consciousness Movement made clear to all the colonised people in South Africa and everywhere else that the most damaging prison is the one in our mind. And also that, whatever the privileges, oppression puts the oppressor in a mental jail as well. The warning of *The Limits to Growth* and the way it was received might have worked as yet another self-fulfilling tragedy. The interpretation of the book as a doomsday prophecy was effective; its lessons were put to the side, preventing us from learning. The fear of questioning a taken-for-granted assumption — the possibility of indefinite growth of material consumption — was strong enough to lead to the acceleration of processes that are driving us to collapse, precipitating what we were afraid of.

What we see today, at least in the evolution of Western countries, is not different from the diagnosis of the Black Consciousness Movement. Our collective psyche is captured in various ways by the fear of loss. We live a paradox: on the one hand, our capacities have never been so developed, so able to pave the way for the reconciliation of Earth and humanity — provided we assume that caring for our fellow humans and non-humans is the other name for a good life. At the same time, countries that struggled to reinvent in modern times the conditions for that equity and provide (at least at home) economic, political and moral foundations for human dignity, are the most scared about the future. It seems we are mentally jailed again, not daring to use our imagination to create the transformative way to better futures.

So, how does each of us consider what the future will bring, for ourselves and our descendants? At a collective level, how do we make sense of this moment in the history of humankind? We cannot help asking these questions because we are humans. But as humans, we can address them in very different ways.

What we learn from this book is that many initiatives worldwide are succeeding in surpassing the limitations of conventional learning. Even if we have not (yet?) escaped from the vicious circle by which conventional "development" leads to self-destruction, we cannot ignore the attempts to do otherwise, at whatever level they have been happening, from local to global. In this sense, this report will give you **a sense of what is happening** and provide hope for the evolution of individual and collective learning.

The "human gap" creates an incapacity for systemic change, a dissonance between the comprehension of our self-inflicted existential challenges and our reluctance to learn and change at the depth required to overcome them. This gap has many manifestations, including the dissonance between the combined capacities and motivations of so many positive initiatives and the insufficient resonance among them to create overall transformation. At the same time, we now have a much clearer perspective to (in the words of Aurelio Peccei) *learn what it takes to learn what we need to learn, and learn it!*

The path is not trivial. It includes *emotional complexity, shifting perspectives, impacts on future pathways and pedagogical insights*. And this book is not a compilation of recipes that could be applied anytime and everywhere in response to any question. But thanks to the hard work of thousands of researchers, teachers, learners, activists and citizens, including those dedicated to preserving pearls of traditional knowledge against all odds, we have not only much better questions to ask but also the elements of processes by which regenerative responses are co-created.

So, we hope this book will inspire you to keep working on the key questions in order to **make sense of what could happen**, inspired by the lights of so much knowledge and action that already exist. Moreover, we are already engaging with the contributors of this book to go further in connecting the dots and start co-creating a wider network, a resonating mycelium of people committed to transformative learning. The intention is to open the space of possibilities to practice unconventional responses leading to new ecological civilisations in which humans are reconciled with themselves, with life at large and with the inevitable condition of time.

On that path, being passionate about learning and education, concerned about humanity's future and intrigued by deep existential and ethical questions seem to be

inextricably intertwined attitudes. In a way, the initiative No Limits to Hope simply uses a new lens for an endless quest coming from the dawn of humanity: **the two-sided search for the meaning of our presence on Earth and what makes a good life**.

Good hints are the crucial role of human dignity and hope, overcoming fear and humiliation, and our capacity to imagine a world beyond domination and hegemony. *Education systems that were never designed to handle collapse might become adaptive, life-generating systems*. Ultimately, humanity will come to an end if we are not able to attune ourselves with the resonant and infinite web of life. And then, a good life is one in which our individuality is but one face of our deep connection with others and with the history of life on Earth.

Chapter 1

Learning from Communities on the Ground

Something is amiss in the way the world learns — the way we take in the voices, practices and wisdom of the communities who understand most intimately what is at stake. As ecological breakdown accelerates, social fabrics fray and institutional trust erodes, the dominant response from education systems has been to double down on what already exists: standardised curricula, credentialed expertise and top-down knowledge transfer. The case studies gathered in this chapter represent a different tradition, one that has never stopped working, even as it has been systematically overlooked. They document what learning looks like when it begins with communities, with land, with relationships and with the honest acknowledgment that the crises we face cannot be solved by the same epistemological frameworks that produced them.

These accounts span three continents and multiple ecological and cultural contexts; Amazonian biomes, Himalayan farming communities, Scottish islands, Swiss cooperatives, Indonesian and South African villages, Australian First Nations country and grassroots civic networks in Japan and India. Their geographic diversity is not incidental. It is an argument: community-rooted, place-based, intergenerational learning is not a niche experiment but a global reality, present wherever formal systems have failed to overpower it entirely.

The polycrisis, the simultaneous unravelling of ecological, social and institutional systems, is also a crisis of knowledge. It is a structural failure in how societies determine what counts as knowledge, who holds it and how it is transmitted. Writing in 1972, Meadows and colleagues warned that unconstrained growth within a finite biophysical system would produce systemic collapse across interconnected domains (ecological, economic and social) (Meadows et al., 2004). Fifty years later, that trajectory has not been meaningfully addressed. Conventional education systems, largely shaped by colonial and industrial logics, have optimised for standardisation, extraction and the production of economic utility. In doing so, they have systematically devalued the very knowledge systems that offer the most coherent responses to the crises now unfolding.

The consequences are visible across the case studies collected here. In Sikkim, the intergenerational transmission of agrarian ecological knowledge is being severed as young people disconnect from land-based life, not because that knowledge has lost relevance, but because education systems have stopped recognising it. In Australia, First Nations communities whose social-ecological systems have sustained human life within planetary boundaries for over 65,000 years remain peripheral to national conversations about sustainability and curriculum design.

These failures are not accidental. As Linda Tuhiwai Smith has argued, the research and educational frameworks inherited from colonialism were never

neutral instruments; they were technologies of epistemic dispossession, designed to delegitimise Indigenous ways of knowing and subordinate them to Western scientific authority (1999, pp. 1–20). Walter Mignolo's concept of the "colonial matrix of power" extends this analysis, showing how the hierarchies established between knowledge systems during the colonial period continue to structure what counts as legitimate learning today (2000, pp. 3–45). Vanessa Andreotti has further argued that decolonising education is not a matter of adding diverse content to existing curricula but of confronting the deeper onto-epistemic assumptions about progress, development and the human that curricula reproduce (2021, pp. 12–35).

What unites these failures is a deeper problem: the dominant human-nature paradigm embedded in Western educational and economic systems treats the natural world as a resource to be managed rather than a community of life to be participated in. Until that paradigm is named and challenged, reforms at the margins, however well intentioned, are unlikely to produce transformative change. The question is not how to improve existing systems, but how to learn from what communities are already doing differently.

What do the case studies reveal?

Read together, these eight case studies illuminate three interconnected dimensions of an alternative educational practice: a reorientation of epistemology, a reconception of the learner and a reimagining of what learning is for.

Epistemological reorientation runs through every case. In the paper "The power of paradigms: Recentring First Nations ways of knowing, doing and being for Sustainability," the Australian comparison of First Nations' circular economy with business-as-usual paradigms uses systems modelling to show that sustainability cannot be achieved through technical fixes alone. As Meadows argued in *Thinking in systems*, leverage points for systemic change lie not in parameters or feedback loops but in the paradigms, the shared ideas and assumptions, out of which systems arise (2008, pp. 145–165). Changing what a society teaches is, in this sense, one of the highest-leverage interventions available. As laid out in the paper "Reclaiming pedagogies rooted in Himalayan ecologies," in Sikkim transect walks (guided walks with local farmers to observe land, crops, and practices firsthand) and farmer-to-farmer conversations surface pedagogical tools like seed-saving, reciprocal labour and land-based mentorship that no standardised assessment would capture but without which climate adaptation becomes abstract and rootless. Ngũgĩ wa Thiong'o's foundational argument that decolonisation begins with language and the restoration of Indigenous modes of transmission is instructive here: the medium of learning is never separable from its content (1986, pp. 4–33).

The reconception of the learner is equally significant. Across these case studies, learners are not empty vessels to be filled with certified knowledge. As described in the paper "Meli's case study: Reimagining learning with Meli Bees Network," in the Amazon, Meli Bees Network's Pollinators are community members who diagnose local challenges, co-develop solutions and connect ecological stewardship with livelihood and governance. In "Commoning as learning" we see how IDEE 21's community of practice treats commoning itself as a form of collective learning, drawing on Elinor Ostrom's design principles for governing shared resources to translate commons theory into lived institutional practice in Switzerland (1990, pp. 88–102). Stakeholder workshops and governance prototyping are not preparation for action but action itself. In Argyll and Bute, a cohort that began as 10 people in 2022 has grown to over 30 by 2025, with participants developing relational skills and creative storytelling alongside and inseparable from the civic work of rebuilding a fragile regional economy, as described in the paper "Collective leadership to nurture a new democratic paradigm in remote and rural Scotland." "Human revolution as transformative learning: Educational practices within the Soka Gakkai Movement" explores how Soka Gakkai members serving in neighbourhood associations and public housing complexes in Japan and India are simultaneously learners, teachers and community stewards. The boundaries between these roles collapse when learning is understood as participation rather than transmission, a vision closely aligned with what Botkin and colleagues, in the report to the Club of Rome - *No Limits to Learning*, called "innovative learning" — learning characterised by anticipation and participation — rather than the "maintenance learning" of shock and adaptation that dominates most formal systems (1979, pp. 8–23).

The purpose of learning is perhaps the deepest reorientation these cases collectively propose. The Indonesia and South Africa community of practice explicitly frames its goal as establishing multispecies learning hubs that enable local green circular economies, learning as the regeneration of shared life ("Learning in nature's classroom"). The Swiss commons initiative draws on Ostrom's design principles alongside Indigenous ways of knowing to argue that stewardship, not control, is the appropriate orientation towards shared resources (Ostrom, 1990, p. 90). The Soka Gakkai framework of "Learn–Reflect–Empower" insists that inner transformation and outer social change are not sequential but mutually constitutive, that hope is not a feeling but a practice built through action in community. This is what Botkin et al. identified as the essential capacity that human learning must develop in response to the global problematique: not merely the ability to adapt to change but the capacity to anticipate it and to participate in shaping it (1979, pp. 37–52). Meadows, writing on systems thinking, described this orientation as "dancing with systems," a posture

of humility, attentiveness and responsiveness that is, at its core, a description of how communities on the ground have always learnt to survive (2001).

What is striking across all eight accounts is the consistency of certain design principles, arrived at independently across vastly different contexts: learning is place-based; it is intergenerational; it is participatory rather than delivered; it honours non-Western and Indigenous epistemologies not as supplemental but as foundational; and it understands ecological and social regeneration as inseparable. These are structural commitments with demonstrable outcomes ranging from restored food sovereignty in the Amazon to shifted power dynamics in Scottish public services.

This chapter offers evidence that communities across the world are already practising the kinds of learning that global crises demand and have been doing so long before those crises acquired names. The task for educators, researchers and policymakers is not to design new systems from scratch but to develop the institutional humility to recognise, protect and learn from what already exists.

The papers that follow are case studies in the fullest sense — not illustrations of theory but knowledge in their own right. They ask to be read not as reports from the periphery of educational discourse but as dispatches from the future. Together, they make the case that hope, in the face of polycrisis, is not naive. It is located. It is practised. It lives in communities on the ground.

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Meli's case study: reimagining learning with Meli Bees Network — Indigenous-led, community-driven, globally connected and regenerative by nature

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Abstract

As humanity confronts ecological collapse, food insecurity and fractured societies, conventional education systems remain unfit for purpose: standardised, extractive and dismissive to the knowledge held by those most intimately connected to the land. Despite stewarding vital practices of resilience, Indigenous and local communities are routinely excluded from shaping how the world learns, governs and regenerates.

Meli Bees Network offers a radically different path. Born in the Amazon and now rooted across Latin America, Meli's education model is peer-led, place-based and grounded in living systems thinking. Through its three core programmes — the Pollinators Fellowship, Pollinating Regeneration and the Meli Think Tank — communities become authors of their own futures: diagnosing local challenges, co-developing solutions and implementing regenerative practices that restore ecosystems, reclaim food sovereignty, revitalise health and culture, strengthen local governance, and influence global climate and education policy.

Learning at Meli begins with experience and territory, weaving ancestral wisdom with scientific knowledge and policy influence. It is applied, iterative and rooted in reciprocity and co-creation. Their territorial learning hubs, known as Meli Hives,

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anchor this model in diverse biomes. Each Hive is led by local Pollinators and serves as a decentralised Climate Action Hub, connecting education with ecological stewardship, livelihood generation and cultural renewal. More than a story, this case study offers proof. Meli's model demonstrates how learning, when it mirrors nature, can transform not just individuals but systems. It is not only about surviving the polycrisis of our time — it is about remembering how to live, together.

Keywords: regenerative education, Indigenous knowledge, territory-based learning, community-led innovation, systems transformation, territorial learning hubs.

Introduction: Education in the Anthropocene

Education today faces a crisis of relevance. Traditional learning models — standardised, extractive and disconnected — prioritise theoretical knowledge while failing to equip individuals and communities with the skills and relationships needed to navigate the climate crisis, biodiversity loss and deepening social fragmentation. These systems often extract knowledge from communities without reinvesting in their autonomy or vitality, reinforcing dependence on external solutions instead of cultivating peer-led problem-solving and cultural continuity.

Yet we are living in a time of profound transformation. As humanity confronts systemic collapse, a vital opportunity is emerging: to reimagine the very systems that shape how we live, relate and learn. Education, in particular, holds regenerative potential, not only to inform minds but to awaken capacities for care, resilience and renewal. When rooted in nature and guided by ancestral values, learning becomes a living process capable of restoring broken relationships between people and the planet.

Across the planet, more than 1.6 billion people — including over 476 million Indigenous individuals — steward approximately 50% of the world's land, including at least 36% of its remaining intact forests and biodiversity-rich ecosystems (Garnett et al., 2018; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2019; United Nations Development Programme, 2026). These communities sustain resilient, adaptive systems of stewardship, food sovereignty and intergenerational learning (Fa et al., 2020). And yet, they receive less than 1% of global climate finance — and of that, only about 17% reaches community-led organisations; meanwhile, they are consistently excluded from formal education, policymaking and investment design (Gjefsen, 2021; Rights and Resources Initiative

& Rainforest Foundation Norway, 2022).

This disconnect has real consequences: over 90% of conservation projects fail to meet their goals when communities are not meaningfully engaged from the outset (Dawson et al., 2021; Brooks et al., 2013). The urgency of addressing this interconnected crisis is undeniable.

Meli Bees Network is working to transform that reality. Rooted in Indigenous leadership and scientific collaboration, we offer a regenerative education model that is peer led, place based and grounded in the logic of living systems. Through three core programmes — the Pollinators Fellowship, the Pollinating Regeneration regranting programme and the Meli Think Tank — Meli equips communities with the tools, networks and knowledge to thrive while revitalising ecosystems, cultures and local autonomy.

At its core, Meli upholds a bold vision: education for this new era must reintroduce humans into nature as participants who are curious, creative and acting in reciprocity with life. This is not about returning to an idealised past but about remembering a truth modernity has tried to forget: learning is a relational, embodied, restorative force. This paper shares how Meli brings that vision to life and how its model can inspire new possibilities for education that regenerate not only ecosystems but our collective capacity to live well, together.

The Meli Bees Network model

Meli's education model is a living, breathing ecosystem of transformation. Anchored by three synergistic pillars — the Pollinators Fellowship, the Pollinating Regeneration regranting programme and the Meli Think Tank — this model turns learning into action and action into systemic change.

These core programmes are grounded in the territorial architecture of our Meli Hives: locally rooted climate action hubs that serve as laboratories for regeneration. Together, these interwoven pathways empower Indigenous and local communities to respond to challenges, shape their own narratives, regenerate their lands and reimagine futures rooted in ancestral wisdom and ecological coherence.

The Pollinators Fellowship: Nurturing leaders of regeneration

At the heart of Meli's education model lies the Pollinators Fellowship — our core leadership programme designed to deepen local autonomy by amplifying the impact of grassroots initiatives. While the fellowship is now the first step for communities joining our ecosystem, it was born out of a need identified during our early work with

microgrants: long-term impact demands local leadership, not just funding.

The 2024 pilot cohort brought together incredible leaders like Jonas (Guajajara), Shirlley (Aymara), Cruwakwyj (Krahô) and Arukapé (Aikewara) — many of whom were already educators, mobilisers and cultural guardians in their territories. Rather than starting them on a new path, the fellowshwn America and beyond.

Pollinating regeneration: Turning ideas into action

Pollinating Regeneration may be the current second step in Meli's ecosystem, but it was actually the first seed planted. As Meli began providing microgrants to support community-designed initiatives, a deeper need quickly surfaced; funding alone was not enough. For these regenerative projects to truly take root, communities needed ongoing mentorship, peer learning and space to grow their leadership. The fellowship was created in response to that insight; it builds capacity from within and ensures long-term, locally led impact.

Today, as fellows develop their visions, Pollinating Regeneration provides seed funding to bring those visions to life. These microgrants support the implementation of tangible, place-based projects such as restoring degraded land with native food forests, building locally governed seed banks and nurseries, initiating meliponiculture systems and creating spaces for intergenerational cultural exchange.

Unlike traditional top-down funding or aid, this programme is grounded in trust, autonomy and cultural relevance. It supports regenerative action that is defined by communities, owned by communities and sustained by communities. In doing so, it keeps fellows actively engaged, transforming inspiration into implementation and nurturing learners' transition to changemakers.

The Meli Think Tank: Bridging worldviews through knowledge

The Meli Think Tank is the connective tissue that links grounded community realities to the corridors of power. It serves as a living bridge between worlds — where Indigenous leaders, scientists, policymakers, educators, funders and changemakers come together to co-create research, policy tools and frameworks rooted in multiple ways of knowing.

More than a platform, it is a relational field — where north meets south, ancestral meets emergent and local wisdom challenges dominant paradigms. It ensures that the lived experiences of Meli's network not only inform — but actively shape — academic discourse, education systems and climate policy.

At its heart is a radical yet simple principle: communities must speak for themselves. By enabling Indigenous and local leaders to be their own interlocutors in global decision-making spaces, the think tank advances authenticity, agency and epistemic justice.

Outputs include community roundtables, co-authored white papers, policy guidance, educational toolkits and global convenings. It is through this generative cross-pollination that the local becomes global — and the global becomes accountable to the communities it seeks to serve.

Meli Hives: Adaptable blueprints scaling regeneration

All Meli's programmes are grounded in our territorial Meli Hives, decentralised Action Hubs that serve as living laboratories for community-led regeneration. Each Hive is co-led by a local Pollinator and their team, creating vibrant, evolving spaces where learning is hands-on, grounded and rooted in ecological stewardship.

Far more than physical locations, Meli Hives embody a methodology which is adaptable to each territory's biocultural context while maintaining a shared framework for peer learning, cross-regional collaboration and systemic transformation. They incubate regranting projects, anchor the fellowship and act as knowledge nodes within the Meli Think Tank, bridging local action with global discourse.

From hosting community gatherings and agroecology trainings to reviving ancestral practices and nurturing intergenerational and cross-sector exchange, Meli Hives transform regenerative education into long-term, lived experience. They remind us that education does not belong in the abstract, it belongs in relationship. It must be lived, embodied and rooted in the everyday rhythms of community and land.

Together with Meli's three pillars, it builds the base for a holistic, scalable model for transformative learning, designed by and for communities, rooted in place yet connected to the planetary systems we must all learn to heal.

Research questions and methodology

Investigative lens: Reframing the role of education

Meli's deeper inquiry is: how can education evolve from being a vessel of information into a vehicle for regeneration? Our case study explores how learning, when led by Indigenous and local communities, rooted in territory, and informed by plural knowledge systems, can contribute to systemic transformation. The following questions guide our investigation:

- How does problem-based, peer-led learning empower individuals and communities to create sustainable, locally anchored solutions?
- What role does integrating Indigenous wisdom and scientific methodologies play in reshaping education systems for the climate and biodiversity crises?
- How can this model be scaled while remaining culturally rooted and contextually relevant?
- What policy implications emerge when education shifts from extractive to regenerative, from standardised to relational?
- What new forms of international cooperation and education emerge when Indigenous and local communities are recognised as equal partners — rights-holders, not beneficiaries — in co-designing solutions?

Rather than offering definitive answers, Meli's model embodies a living response, an evolving practice of learning-in-relation that continuously adapts to the biocultural realities of each territory and the community living there. This regenerative vision emerges from a methodology that is lived, evolving and grounded in place. What follows are the principles that make Meli's pedagogy effective across cultures and contexts.

Methodological principles: A living pedagogy

Beyond a static curriculum, Meli's approach is a regenerative pedagogy — one that emerges from the land, adapts to its people and evolves through relationships. Five interdependent principles guide this living methodology:

Peer-led learning: Regeneration through relationship
Learning at Meli is anchored in community. Rather than being taught top-down, knowledge is exchanged horizontally, via peers rooted in the same social, ecological and cultural contexts. Local Pollinators serve as facilitators rather than instructors, activating trust, belonging and co-responsibility within and across territories.

Problem-based learning — Turning challenge into curriculum:

Education begins with diagnosis. Fellows identify challenges in their territories (from soil degradation to cultural erosion) and co-create solutions through guided experimentation. This applied approach strengthens critical thinking, initiative and long-term commitment to place.

Territory-based learning — Knowledge that lives where you are:
All learning is grounded in the biocultural realities of each Hive. From meliponiculture

in the Cerrado to food forests in the Amazon, participants learn not only about nature but with and through it, reviving ancestral ways of knowing from the Earth. Territory becomes both context and teacher, transforming abstract concepts into embodied understanding.

Story sharing as epistemology — Remembering through narrative: Sharing stories is more than communication; it is methodology. Oral narratives encode ecological knowledge, transmit cultural values and foster intergenerational connections. Meli harnesses this ancestral neuroscience to strengthen memory retention, agency and rootedness in identity.

Knowledge weaving — Bridging ancestral and scientific intelligences: Meli's pedagogy holds space for multiple knowledge systems to meet not in extraction or hierarchy but in dialogue. Fellows explore agroecology, climate data and biodiversity science alongside rituals, spiritual practices and local cosmologies. This co-weaving generates hybrid solutions grounded in both rigor and respect. Together, these principles cultivate the skills and the relational intelligence needed to navigate complexity, nurturing communities that learn how to regenerate from within.

Monitoring and evaluation: Measuring the seen and unseen

These guiding principles shape how learning happens, but how do we know it's working? To evaluate both visible outcomes and invisible transformations, Meli approaches impact as a multilayered, reflective practice.

Measuring the impact of regenerative education requires more than metrics. It calls for attentiveness to both the visible/quantitative and the invisible/qualitative, the immediate and the long term.

Quantitative indicators include:

- Number of hectares restored through agroforestry and meliponiculture.
- Number of Pollinators trained and projects implemented.
- Number of communities engaged and cross-territorial exchanges hosted.

Qualitative insights are gathered through:

- Participatory diagnostics that map community needs and aspirations.
- Ongoing story sharing and visual documentation (videos, testimonials, drawings).
- Facilitator reports that track shifts in confidence, leadership and cohesion.

Emerging evaluation practices:

Recognising that some of the most important transformations — cultural resilience, trust, intergenerational healing — are not easily quantified, Meli collaborates with academic allies to deepen evaluation tools. In partnership with institutions like the University of Bristol, State University of Maranhão (Universidade Estadual do Maranhão) UEMA and the University of Colorado Boulder, we are co-developing frameworks that blend community-led assessment with academic rigor. This includes tools to assess relational dynamics, cultural continuity and systemic influence, ensuring that the invisible gains of regenerative education are made visible, are valued and are shared.

Voices of regeneration

Across territories and continents, Meli's Pollinators are transforming education into lived regeneration. Each voice below carries a testimony and a lived truth: when communities reclaim the right to learn from their land, they reclaim the future.

"*With Meli, I realised that our knowledge is not only resistance — it is leadership. Now, we are not waiting for help from outside. We are the ones training others, planting food forests and creating our own future.*"
— *Arukapé Suruí Aikewara*, leader of Indigenous Health Council, vice-chief of Tukapehy Village (Amazon, Brazil)

"*As an agronomist, I've worked with Andean superfoods in the lab — but Meli helped me reconnect science with our ancestral knowledge. Now, I research not just for academic purposes, but for our people's health, food sovereignty and dignity.*"
— Shirley Mamani, Aymara agronomist and researcher (Andean Highlands, Peru)

"*Meli gave us the confidence to build our own solutions. Now we plant agroforests, raise stingless bees and train the next generation. It's like they knew exactly what we needed.*"
— Jonas Lima Guajajara, first Indigenous agroecologist of Araribóia Territory (Amazon, Brazil)

"*As a lawyer, I defend Indigenous rights in the courts. With Meli, I also defend them through agroforests, bees and stories. Our podcast gives voice to our people, and Meli helps us build solutions that are rooted, collective and alive.*"
— Gabino Damián, Zapoteco lawyer, podcaster and agroforestry advocate (Oaxaca, Mexico)

"*Through Meli, I've learned that regeneration is not just ecological,*

it's relational. Working with Indigenous knowledge holders has changed how I farm and how I live. It's a humbling and hopeful path." — Christiane Wiedemann, agroecologist and beekeeper (Germany)

"*When I saw Meli's model, I recognised our shared vision: using bees, trees and community knowledge to restore both land and dignity. Adapting this blueprint in Tanzania means we're not starting from scratch, but building on something alive, proven and deeply aligned with our goals.*" — Mayaya Kashinje Singu Mack, social entrepreneur and regenerative agriculture leader (Tanzania)

Together, these voices show that regeneration is a path walked, a story shared, a seed planted and a system remembered.

Critical reflections and replicability

Learning to regenerate in the real world: Tensions, lessons and pathways forward

While Meli's model has generated powerful outcomes, its journey is not without challenges. Working across biocultural territories, linguistic diversity and plural epistemologies demands both humility and adaptability. Regenerative learning, by its nature, is complex and nonlinear. And so is the path to scaling it with integrity.

Challenges faced:

- Digital Divide: Many communities lack stable internet access or digital infrastructure, limiting opportunities for exchange in real time and for broader visibility. While our weekly trilingual calls serve as a vital space for community-to-community connection, digital access remains uneven, requiring creative, low-tech solutions and asynchronous formats.
- Funding Constraints: Despite the proven impact of community-led climate action, funding remains scarce, especially for initiatives that prioritise relational outcomes over rapid metrics. Meli's deep, trust-based work often sits outside conventional funding frames, making long-term sustainability an ongoing challenge.
- Epistemic Injustice: Indigenous knowledge systems are still too often undervalued, extracted, or tokenised in academic and policy spaces. Building a truly pluriversal education model means confronting power imbalances and making space for ways of knowing that do not conform to dominant

paradigms. This requires ongoing dialogue, translation and collective unlearning.

- Time and Trust: Regeneration moves at the pace of relationship. Scaling a model that depends on depth, presence and reciprocity requires careful stewardship. There is no shortcut to trust and no substitute for time spent walking the land, listening and showing up consistently.

What makes Meli's approach scalable?

Meli's strength lies in resonance. Our model is scalable precisely because it is non-linear, modular and adaptable to each territory. Rather than imposing a one-size-fits-all curriculum, Meli offers a set of guiding principles, tools and pathways that communities can make their own.

The Meli Hives serve as place-based blueprints for this. Each Hive adapts the model to its cultural, ecological and social context, while still connecting to the wider network through shared values, methods and strategic learning loops. This creates a distributed, decentralised system that is strong in its diversity and unified in its commitment to regeneration.

Instead of duplicating form, replication happens by seeding function: inspiring new hubs, fellowships and learning spaces that respond to local realities while remaining linked to a global impact web.

This approach also lowers the barrier to entry: a Hive can begin with one Pollinator and a community garden, then grow organically into a full-fledged Climate Action Hub. What matters most is not scale in numbers but depth in impact, alignment in values and the ability to catalyse transformation from within.

Policy and paradigm shift

What began as a grassroots education initiative is now influencing broader systems. As Meli's local solutions scale and connect, their ripple effects are reaching policy, governance and global narratives on climate and learning. This section explores why Meli's work cannot be confined to the realm of education alone.

At Meli we aim for a paradigm shift in how we understand governance, knowledge and climate resilience. By centring Indigenous leadership, peer-led learning and territory-based action, our model expands the scope of what education can be: not merely a tool for individual advancement but a foundational process for community self-determination, ecological stewardship and systemic transformation.

Education as governance

In many territories, where formal state presence is limited or extractive, learning becomes a form of governance. Through Meli Hives, communities diagnose challenges, deliberate solutions and make collective decisions about land use, seed sovereignty, climate adaptation and cultural renewal. By equipping communities with the knowledge, confidence and networks to shape their futures, Meli strengthens local autonomy and reclaims decision-making power from top-down models. These self-governed societies result in better-educated individuals and more resilient ecosystems.

From policy recipients to policy authors

Most education and climate policies are designed far from the territories they aim to serve. Meli flips that script. Through the Meli Think Tank, Indigenous and local leaders are not passive recipients of policy, but co-authors of new frameworks. Participatory roundtables, white papers and cross-sector dialogues allow community-rooted knowledge to inform national and international processes from climate finance to biodiversity credits, from education reform to regenerative development.

This is especially relevant in multilateral arenas like the United Nations Framework Convention on Climate Change and the Intergovernmental Panel on Climate Change, where the inclusion of Indigenous knowledge is gaining recognition but often lacks meaningful implementation. Meli contributes with a field-tested model that shows how to embed diverse knowledge systems in practice through partnerships rather than through extraction.

A living update to No Limits to Learning

In 1979, the seminal report to the Club of Rome - *No Limits to Learning* challenged global institutions to reimagine education for planetary survival. It called for a shift from transmissive to transformative learning, from fragmented knowledge to integrative thinking and from centralised models to participatory processes.

Decades later, Meli answers that call with muddy feet, beeswax fingers and stories spoken under forest canopies. This is *No Limits to Learning* made tangible: a living system that learns with nature not despite it. By bridging ancestral and contemporary knowledge, Meli updates the vision with grounded experience, offering a replicable model for the kind of education the Earth now urgently needs.

Editors' Biographies: Reweaving the human role in a living world

Meli Bees Network emerged from a simple, radical belief: that learning, when rooted in place, guided by ancestral intelligence and shared in community, can regenerate not only ecosystems but our humanity by restoring our relationship with nature.

In a world fractured by disconnection, Meli offers a pathway to coherence. By reuniting knowledge with wisdom, education with experience and policy with lived practice, Meli bridges the human gap: the dissonance between what we know and how we live. It teaches that regeneration is not a concept to be taught but a relationship to be remembered.

At Meli, regeneration is learnt in the soil, through the hive, around the fire. It's felt in the courage of a Pollinator who dares to dream differently, in the resilience of a community reclaiming its seeds and in the voice of an elder whose story shapes a future.

Meli's case contributes a living hypothesis to the global education discourse: when learning is rooted in territory, driven by community and guided by ancestral wisdom, it can regenerate knowledge systems and the very fabric of human and planetary relationships.

As the climate crisis deepens and conventional solutions fall short, the time to invest in regenerative, relational learning models is now. We invite:

- Educators to expand what counts as knowledge and who gets to teach it.
- Funders to support initiatives that grow from the ground up and return value to the land.
- Policymakers to listen deeply, share power and co-create frameworks that honour plural ways of knowing.

If we are to learn how to live well together on this planet, we must begin by learning from those who still remember how. Let learning be what it was always meant to be: a regenerative force, rooted in life.

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Biographies

Ivani Pauli is a Biologist and systems thinker working at the intersection of biology, leadership and regenerative futures. Drawing from systems biology, Indigenous wisdom and living systems science, she explores how nervous systems, metabolism, and relational intelligence shape leadership and collective decision-making. Inspired by a lineage of land stewards and community leaders, her work helps leaders, organisations and families align with the principles of life. Through science, storytelling and systems thinking, she cultivates resilient, life-centred leadership for a regenerative and interconnected future. ivanipauli@gmail.com | ivi-pauli@meli-bees.org

Ana Rosa de Lima is a community weaver, initiator and director of Meli Bees Network. Omágua woman raised in the Amazon's arc of deforestation, she witnessed firsthand the links between environmental destruction and human rights abuses. Driven by this reality, she built a network that engages and supports hundreds of communities across endangered territories to foster regenerative practices, strengthen local leadership and advance climate justice. What began in the Amazon has since expanded across multiple biomes, weaving collaboration, restoration and community-led transformation globally. ana-rosa@meli-bees.org

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Learning in nature's classroom

Janet J. McIntyre-Mills, with a community of practice comprised of facilitators, members of the community and participants using many ways of knowing, including Yiannis Laouris, Mphatheleni Makaulule, Marcus Hallside, Patricia V. Lethole, Siphiwe I. Buthelezi, Nyamakazi Kgomotso, Ida Widianingsih and Riswanda*

Abstract

Our work addresses the concern that not only are we living beyond our limits as a human species but we are also using the resources of other species on which we are dependent. In order to "learn for life," the community of practice spans projects in Indonesia and South Africa with graduates, their students, colleagues and members of the community. The ancient societies of Ciptagler (West Java, Indonesia) and Bady (Bantam Province, Indonesia) and the resilient communities in South Africa led by Dzomo la Mupo are inspiring intergenerational learning. We have chosen to work in Africa and Indonesia, two emerging economies that share a colonial legacy. The case study areas also share concerns associated with the following: high rates of urbanisation, habitat and species loss and displacement and the risks associated with climate change, such as food, water and energy security.

The potential implementation of our research for future learning and educational policies would involve setting up learning communities as multispecies hubs that work together to enable local green circular economies. The common good needs to be supported by democratic engagement using metalogues and structured democratic dialogues. Our area of concern is 1) learning lessons from communities that have food security and are self-reliant; 2) how to protect these communities; 3)

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applying the lessons to support local green circular economies in other communities.

Keywords: co-learning, interbeing, Indigenous custodians, multispecies relationality, redressing species apartheid

Research questions, methodology and expected outcomes

Our applied mixed-methods praxis addresses the challenge of species apartheid by learning from communities that live in harmony with nature and applying these lessons to re-establish multispecies relationality in circular green economies. This research fills critical knowledge gaps and proposes pathways to address global challenges such as overpopulation, climate change, ecological degradation, displacement, hunger and thirst. By integrating traditional ecological knowledge from Ciptagler, Baduy and Dzomo la Mupo with modern regenerative and sustainability practices, we aim to create resilient systems that benefit humans and non-human species while inspiring educational policies rooted in intergenerational learning and ecological stewardship.

The aim of this engagement research is to explore participatory democracy and governance strategy with a community of practice in Australia, Indonesia and South Africa by building on the team's established track record on case studies of multispecies hubs linked with participating universities. Our research hypothesis is that the greater the level of participation by Indigenous custodians and local community participants in multispecies hubs, the greater the match between users' perceptions and governance outcomes. Our multimethod approach combines participatory action research within case study areas with synchronous Zoom meetings and asynchronous metalogues to engage with participants. For example, we host training sessions to enable and mentor across the following kinds of initiatives and efforts:

- Establishing and testing community engagement processes with the Future Worlds Centre and International Systems Sciences members to address the concern that currently democracy is under threat by confusing freedom from responsibility with freedom to exploit. Our community of practice comprises cross-cultural and multi faith groups.
- Training citizen scientists to test water and, using the iNaturalist website, which is freely available at https://www.inaturalist.org/pages, map species within the neighbourhood to raise awareness of local biodiversity and monitor and benchmark the local habitats.

- Setting up Indigenous plant nursery, seed bank, organic compost and associated organic market for vegetables, plants, compost and healthy snacks. The leadership of Dzomo la Mupo and the organic farmers' network (Participatory Guarantee System, PGSA) enables co-learning.
- Water testing to help improve the natural wetlands to support bird sanctuaries, for example at Daveyton (South Africa) and Tarumajaya (West Java) to protect the Citarum River.
- Creating a virtuous cycle to protect the local wetlands and to create a bird sanctuary. Together we address production, marketing and management of projects, including a sewing project making re-useable sanitary ware and a laundry located at the Daveyton campus of the University of South Africa.

Participatory action research in prefigurative projects together with the community

The organisations include local government, regional government and community groups — for example, in South Africa, Dzomo la Mupo (Voice of the Earth), Singabanakekeli beMvelo (looking after nature/Nurturing nature), Tlhahopele (Voice of Nature), Thusanang (Caring for others), and volunteers and trainers linked with the Participatory Guarantee System.

The facilitators are based at universities such as University of Adelaide, University of South Africa, Universitas Padjadjaran, University of Indonesia and Universitas Sultan Agang; at provincial and village-level governments and government departments such as the Ministry of Religious Affairs; at research institutes, such as the Future Worlds Center; and at professional organisations such as the International Society for the Systems Sciences.

Our multimethod approach combines qualitative and quantitative methods, which we apply through participatory design and praxis with Indigenous custodians and local communities to address multispecies relationality. Our fieldwork comprises both focus groups and in-depth interviews with relevant sectors of the local population.

Together we can grow, and together we can inspire hope by building on an existing community of practice with Indigenous knowledge holders and local communities. Co-creation is the process for collaborative community engagement. Metalogues can help to avoid (or remedy) misunderstanding, the omission of important

ideas, and speaking for or over others. It provides breathing space between the stimulus of engagement and the process of coming up with an agreed-upon output or outcome. This postcolonial and non-anthropocentric approach is rooted in collegiality and a recognition of our hybridity and interconnectedness with many species; as such, it celebrates our interbeing across species and cultures. We strive to test engagement and governance processes to protect multispecies relationality linked with circular green local economies according to the understanding that the "mistreatment of one species is mistreatment of all." This understanding "means expanding our epistemologies and methodologies" (Simard, 2021, p. 295).

Learning outcomes and outputs

Co-learning is based on many ways of knowing used by Indigenous and non-Indigenous academics, leaders and community practitioners, including farmers. Our work is a dynamic form of multispecies neuroscience in action. Our findings empower educators and practitioners to drive systemic change through a community of practice that addresses transformative education based on learning by doing, enabling people to understand the need to move away from polarisation to multispecies relationships (see McIntyre-Mills & Corcoran-Nantes, 2022) and helping to inspire practical affirmative interventions to support multispecies relationships (McIntyre-Mills, 2024a, 2024b). We incorporate traditional knowledge and Indigenous wisdom into our research by working with Indigenous custodians to learn lessons of resilience from communities that protect forests, rivers and wetlands and rely on organic farming methods that foster multispecies relationships. In South Africa, for example, unemployment is at 31%, but it is much higher among young people and those with disabilities. Food production and enterprises that support food security for the unemployed and can also promote hope for self-employment by building experience and skill.

Our research has implications for future learning and educational policies insofar as it demonstrates how to set up learning communities, one multispecies hub at a time. This is what we are doing in our community of practice. We "learn by doing" with community leaders and Indigenous custodians in a prefigurative, multidisciplinary action learning project.

Future learning and educational policies are supported by the University of South Africa, which has so-called flagship status, with community engagement leadership by Patricia Lethole of the Daveyton hub. Facilitation and mentorship are also provided by members at the University of Adelaide, Universitas Padjadjaran. Additionally,

McIntyre chairs the Special Integration Group at the International Society for the Systems Sciences[1] called "Balancing Individualism and Collectivism" and facilitates a related community of practice.

Our research addresses the challenges of the Anthropocene and the broken relationship between humans and nature. A cross-cultural, interdisciplinary team focuses on intergenerational learning, as Indigenous custodians support knowledge on regeneration, multispecies relationality and wellbeing. We foster youth leadership by sharing the lessons of best practice and action learning teaching and learning through our community of practice, which is well placed to collaborate with partner investigators in South Africa, Australia and Indonesia. To sum up, community engagement is through:

Setting up a learning community with a range of stakeholders, including the employed and unemployed, to enable ongoing learning across generations, disciplines and cultures. Our transdisciplinary approach engages communities and universities in exploring practices that regenerate life-forces (Mupo) and create employment opportunities by working with the environment.

Collaborative efforts using mixed methods by collaborating with the University of South Africa, the Participatory Guarantee System, the University of Venda, the University of Adelaide, Universitas Padjadjaran and Universitas Sultan Agung to learn from Ciptagler and Baduy communities. Graduates who are linked with the areas; the custodian Mphatheleni Makaulule, who leads Dzomo la Mupo; and other institutions integrate Indigenous and Western knowledge systems.

Teaching and learning to balance Indigenous knowledge with Western scientific approaches, promoting a green circular economy using a metalogue approach to weave together many ways of knowing.

Community engagement and action learning in nature's classroom

Our systemic educational practices include the use of metalogues to co-learn with Indigenous custodians and facilitators. We combine eco-mapping and mapping pathways to wellbeing techniques supported by PhD graduates, and we use structured democratic dialogues with leaders such as Dr Yiannis Laouris of the Future Worlds Center. Our praxis is based on engagement with a community of practice and includes case studies, reflections and metalogues based on participatory design

1 https://www.isss.org/home/

and engagement; participatory action research and an extended form of critical systemic approach is applied to local areas of concern.

Metalogues can be defined as commentary on Zoom conversations that can be synchronous or conducted asynchronously as commentary by email or WhatsApp after interactions. This enables people to weave together strands of experience when they have thought about what was said in meetings. It enables people to add to ideas in ways that they feel comfortable.

Structured democratic dialogues (see Laouris, 2024) build on the legacy of the founders of global agoras, in particular Emeritus Prof Christakis and Bausch (2006), Bausch et al(2012) and Flanagan et al, 2012) to enable participants to engage with one another synchronously and asynchronously by generating a triggering question, which motivates them to suggest ways forward to address areas of concern. Our focus is on sustainable living and on ways to promote peace and to balance multispecies needs (see McIntyre-Mills et al., 2024). Our triggering question is: What actions can we take to shift from competition to collaboration and to foster a sense of harmony/ unity in resolving our conflicts?

We use augmented artificial intelligence (AI) in a very limited manner to record meetings. The transcripts are then corrected by comparing them with the recorded Zoom videos and are considered in the light of metalogues so that the context and meanings could be explored and checked by all the participants who were involved in the research and decision-making. Our assumption is that "biology is best" and that AI needs to be governed to serve the interests of the common good, namely social and environmental justice (McIntyre-Mills, 2024a,2024b, 2025a,2025b).

The code is no replacement for learning by, with and for living systems as discussed in a forthcoming volume *All for one and one for all: Setting up multispecies neighbourhoods*. The members of the community of practice work together to build on our work detailed in *From polarisation to multispecies relationships* (2021), *Transformative education* (2022) and *Affirmative intervention to support multispecies relationships* (2024), for example. The structured democratic dialogues process involved 16 active participants who provided action ideas, 35 participants who provided bios and a further 7 participants in the Zoom conversations; the total number of participants was 42. Emailed conversations and WhatsApp groups formed the wider research conversation and research proposal. The participants varied across the sessions, and we needed to rely on asynchronous communication to complement the synchronous meetings. An added concern was the cost of connecting to SDD meetings, as the members did not have access to personal computers and relied on access to computers at the University of South Africa. Sharing computers and voting

using WhatsApp made the process feasible for some of the participants. Face to face workshops were held every week and members of the hubs meet daily within their neighbourhoods. Hub leaders facilitate using distributive leadership that we call "Lotus Leadership" to co-create solutions, despite challenges.

When the structured democratic dialogue was conducted in 2024 with members of the community of practice, a form of AI meeting recording was used to help summarise the minutes. Similarly when data were collected in Tarumajaya (West Java) with members of the community of practice in Tarumajaya (Wirawan et al., 2023) based on summaries that were generated using AI, it was programmed to provide a basic data sort and to group the themes according to the pathways of wellbeing design, namely: "Business as usual," "Taking small steps" or "Living in ways that support wellbeing." The patterns were grouped in terms of material and non-material haves, needs, barriers and turning points for better and worse (as detailed in McIntyre-Mills et al., 2014). To sum up, the engagement research on democracy and governance underpinning our current and planned research builds on, updates and extends the legacy of the founders of the Club of Rome, in particular Alexander Christakis, to enable participants to engage with one another synchronously and asynchronously. A triggering question motivates them to suggest ways forward to address areas of concern. Together we consider if-then scenarios and consider the consequences for ourselves, others (spanning diverse life chances and other species) and our shared habitat.



Figure 1: Mapping to incorporate co-learning. Photo provided by Patrica Lethole and Mphatheleni Makaululu

We use a range of methods to support community learning, such as mapping and learning to use the iNaturalist website, despite the challenge of limited access to home computing. The Indigenous custodians focus on protecting forests, rivers and wetlands and rely on organic farming methods through multispecies relationships. This is where the ecological mapping method is applied. Participatory workshops that engage all age groups from the community as well as academic researchers use appropriate action learning approaches.

The research at the Daveyton Hub takes place despite limited resources within the community. Learning hubs equipped with computers and classrooms can be used as work spaces for small enterprises. The entire campus is dedicated to learning by doing in order to support the local wetlands area. As a result of the engagement, the community is becoming aware of the implications of protecting the environment through small enterprises dedicated to recycling and showcasing the environment. The student facilitators, such as Kgomotso and Sipho Innocent Buthelezi, play an active role to empower members of the community and to help hub leaders to connect with a range of organisations.



Figure 2: Learning how to use the iNaturalist website in Daveyton, South Africa. Photo provided by Patrica Lethole. The members of the community of practice are making use of University of South Africa equipment to enable community training.



Figure 3: Learning to use the iNaturalist website in Tarumajaya, West Java and action learning groups. Photo provided by Ida Widianingsih.



Figure 4. Members of the community of practice linked with Universitas Padjadjaran planting trees. Photo provided by Ida Widianingsih.



Figure 5. Planting Tarum trees with the community in nature's classroom. Photo provided by Ida Widianingsih.

One of the outcomes of the community engagement is regeneration of the Tarum tree in the Tarumajaya area by collecting seeds from the solitary remaining tree in the district and growing seedlings for replanting along the Citarum River where they originally grew (Usmadi et al, 2021). The students, researchers linked with Universitas Padjadjaran, worked together with community members to plant the Tarum trees in January 2025. Regular training sessions are held and linked to competitions to inspire learning about the environment. Together with other stakeholders, the Citarum Harum Program and taskforce managed to regenerate the Tarum trees but since the Citarum Harum Program ended in March 2025, there was growing concern as to whether reforestation would continue. So, the head of Tarumajaya Village decided to work with Universitas Padjadjaran's research team, which was linked with this community of practice. To date about 400 Tarum trees have been planted. Batik makers now focus on using the Tarum tree as a symbol for their patterns as another way to raise awareness. At the end of the workshop a celebration was hosted by local government and Universitas Padjadjaran.



Figure 6. Using the Tarum tree as a symbol to decorate Batik. Photo provided by Ida Widianingsih.

Analysis

The concept of multispecies relationships suggests critical systemic pathways to protect shared habitats in line with the UN's 2030 sustainable development agenda by drawing on local wisdom and the need to implement laws to prevent ecocide (Higgins et al., 2013; TEDx Talks, 2012). Our work demonstrates a) how the eradication of species as a result of rapid urbanisation places humanity at risk and b) demonstrates how narrow anthropocentrism has focused on the rights of human beings at the expense of other species and the environment. It explores norms and indicators that include and protect multiple species. It discusses ways to foster engagement at the local level with a community of practice spanning cultures and disciplines to prefigure change at the local level by focusing on social enterprises that address food and water security. Some of the patterns of engagement that could contribute to the human stewardship of habitat include:

- Recognition of the interdependency of living systems and understanding the implications of "interbeing" for social and environmental justice.
- Responding in context and making ongoing policy adjustments. This requires new architectures of democracy and governance that redress power imbalances.
- Appreciation of cycles for regeneration in designs that sustain living systems. This requires a rural-urban balance to protect habitat for domestic, farm and wildlife — an approach based on extending Ashby's (1956) notion of "requisite variety" to span multiple species.

Barriers to achieving these goals include power imbalances within and across species which require intersectional understanding of the way in which species membership, gender, race, culture and abilities shape the postcolonial power dynamics that underpin injustice.

Our ongoing research addresses new architectures for democracy and governance to extend solidarity and an understanding of our co-dependency on diverse living systems, in order to prevent ecocide (see McIntyre-Mills, et al 2023, 2024).

Political fragmentation and populism, driven by capitalism, anthropocentrism, sexism, speciesism, nationalism and racism, have become a new dominant order. The case has been made that liberalism has gone too far and is undermining collective (cosmopolitan) responsibility. Our current programme of research continues to address ways to enhance representation, accountability and the regeneration of living systems. The first author, Janet, facilitates an interdisciplinary and cross-cultural community of practice spanning organisations and universities and chairs

the Special Integration Group 'Balancing Individualism and Collectivism' for the International Society for the Systems Sciences. This is demonstrated by emphasising 'All for one and one for all: action learning through multispecies hubs that strive to protect and re-generate local environments through arts, crafts and organic growing methods.' (McIntyre-Mills, 2025a, 2025b).

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Commoning as learning: building a Swiss commons manual and community of practice

Philipp Schweizer Huguenot[*]*, Jonas Beck and Jemima Robertson*

Abstract

In response to today's interlinked ecological, social and institutional crises — often referred to as the polycrisis — this paper explores the potential of commoning as a practice of place-based learning, governance and transformation. Grounded in a case study from Switzerland, it presents an initiative led by IDEE 21, an eco-social cooperative that combines the co-creation of a commons manual with the development of a transdisciplinary community of practice. This dual intervention bridges the gap between commons theory and implementation by translating key principles — drawn from Elinor Ostrom's design principles, Indigenous ways of knowing, systems thinking and bio-regioning — into practical, context-sensitive tools for collective stewardship. It offers insights into how commoning can serve as embodied, collective learning and collaborative stewardship, particularly in multistakeholder processes dealing with complex, uncertain problems. Positioned at the intersection of theory and grounded experimentation, the project explores how commons-based learning can reweave relationships between people, place and the living world. It emphasises stewardship over control and learning as a relational and participatory process rooted in specific ecologies and communities. Through participatory methodologies — such as stakeholder workshops, governance prototyping and peer exchange — the project highlights the importance of social process design, ecological thinking and distributed leadership in building resilient commons. The paper argues that commoning, when grounded in place and supported by intentional social learning, holds transformative potential for navigating complexity and cultivating systems resilience. It contributes to emerging scholarship on commons-based governance by documenting applied

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practices and design insights, positioning the commons as both a framework for action and a site for multigenerational, practice-led learning.

Keywords: commoning, stewardship, participatory governance, place-based learning, systems change

Introduction: Commoning as learning in a time of polycrisis

In 1979, No Limits to Learning warned of the "human gap" — the widening disconnect between the accelerating capacity of human societies to transform the planet and our limited collective ability to understand and govern those transformations wisely (Botkin at al., 1979). Over 40 years since this initial warning, we find ourselves in a decade marked by systemic breakdowns in the climate, biodiversity, our economies and democratic integrity — constituting the so-called polycrisis or metacrisis (Schmachtenberger et al., 2023). The imperative to bridge the "human gap" is thus more urgent than ever.

This paper examines the commons as a paradigm and practice with the transformative potential to bridge the human gap and lays out the approach of a concrete initiative, facilitated by IDEE 21, in the context of Swiss commons. More than a resource-management system, commons-based governance is a form of deep planetary stewardship grounded in mutual care, place-based reciprocity and participatory learning. It serves as a living framework for enacting collective intelligence — particularly when embedded in bioregional settings where human and nonhuman agencies are tightly interwoven. While there are clearly biophysical limits to growth (Meadows et al., 1972) in terms of economics, population and material use, our capacity for learning and transformation is limitless. Donella Meadows has identified paradigm shifts and the capacity to transcend paradigms as being the highest and most fundamental leverage point for meaningful systems intervention (Meadows, 2010). As such, this paper proposes that commoning as a practice may facilitate the ontological shift that is critical for place-based communities to collectively navigate the polycrisis. In the words of Simon Grant (2026, para. 2), "ontological commoning is the 'process and practice of finding common ground between different perspectives on a complex situation'; it involves "finding ways to make sense of each other's conceptual models, without erasing differences, but generating a wider perspective within which individual perspectives can be inter-related.". Commons can be the classrooms that capitalist societies need for communities to rapidly cultivate the knowledge and wisdom to live well within planetary boundaries. We assert that this framing of the commons opens up new

possibilities for multigenerational other-than-institutional learning.

To address the potential of commoning, we present a case study of an ongoing context-specific project initiated by IDEE 21 in Switzerland, which involves the co-creation of a commons manual and the formation of a community of practice. Together, these efforts aim to explore and support the learning potential of commoning. By grounding theory in place-based experimentation, the project develops practical tools, fosters peer exchange and creates conditions for communities to engage in collaborative stewardship and shared inquiry. In what follows, we introduce our initiative in Switzerland. We outline the theoretical grounding that shaped the project, describe our participatory methodology and reflect on the lessons emerging from place-based experimentation in commoning as a learning practice.

Commoning as practice: co-creating a manual and community of practice

Grounding the project: conceptual foundations and contextual observations

This section lays out a brief introduction to commons discourse and its influence on our project approach. Interest in the commons has re-emerged as a response to what is termed the polycrisis (Scorsone, 2026). Historical evidence (Ostrom, 1990) demonstrates that shared resource governance has often succeeded and was only recently marginalised. David Bollier defines the commons as "a pervasive, generative, and neglected social lifeform. They are Complex, Adaptive, Living Processes that generate wealth (both tangible and intangible) through which people address their shared needs with minimal or no reliance on markets or states" (Bollier & Helfrich, 2019, p. 74). This definition moves beyond conventional economic models that classify commons as non-excludable, rivalrous goods, distinct from private, public, or club goods, by focusing on collective stewardship that operates outside both market and state structures.

The commons recur as a foundational theme across academic and practitioner discourses, including degrowth, ecological economics and Indigenous knowledge systems. They are not a marginal or utopian idea but have been widely practiced — globally and specifically in Switzerland — despite the ongoing capitalist and colonialist plundering and erasure of commons and commoning practices. As such, they represent a historically grounded and enduring form of resource stewardship. Their contemporary relevance lies in their ability to complement, rather than replace, market and state institutions, while challenging the dominant assumption that markets are the most efficient means of managing fragile resources. Instead, commons emphasise

the situated knowledge and agency of local communities (Bollier & Helfrich, 2019). However, our research revealed a persistent gap between the theory and practice of commoning and a lack of place-based/context/bioregional-specific literature. The concept of the commons often remains inaccessible to practitioners due to limited knowledge dissemination; a lack of actionable frameworks; or entrenched assumptions around property, individualism and market-based solutions.

Failures in commons-based projects are frequently attributable to structural conditions or design flaws — issues that could be addressed earlier in the process — or to the challenge of confronting deeply embedded neoliberal worldviews grounded in competition and economic rationality.

To enhance the relevance of the commons across domains — agriculture, community spaces, digital environments, small businesses — it is helpful to shift from "the commons" as a static resource category to commoning as a relational, adaptive practice. This enables broader participation, including by private actors, if core principles are upheld. As David Bollier writes: "It is less a noun than a verb because it is primarily about the social practices of commoning — acts of mutual support, conflict, negotiation, communication and experimentation that are needed to create systems to manage shared resources" (2016, p. 2). As such, commoning holds transformative potential for place-based and practice-led forms of learning and governance and is the approach used in this initiative.

Project initiator: IDEE 21

IDEE 21 is a Swiss cooperative based in Lausanne and Bern, working at the intersection of participatory governance, sustainability and social innovation. It collaborates with public institutions, civil society and communities to design inclusive processes and support collective decision-making. Organised sociocratically[1], the structure and approach of IDEE 21 align closely with commons-based principles such as shared responsibility, mutual learning and transparent governance. A member of the Chambre de l'Économie Sociale et Solidaire, IDEE 21 combines applied research, facilitation and strategic design. Since 2021, it has hosted an innovation hub to incubate socially and ecologically impactful initiatives.

1 In terms of Idee 21, sociocratic governance is a way of distributing authority across several collaborating teams or 'circles', each with defined purposes, roles, tasks, and areas of authority. While a certain degree of hierarchy or "verticality" remains to ensure efficiency, authority is distributed across the circles rather than being concentrated at the top.

Methodology

This project employs a practice-based, participatory approach rooted in commons theory and place-based learning. It combines stakeholder workshops, governance co-design and iterative prototyping with an extensive literature review and ongoing exchanges with both local and international researchers and practitioners. Drawing on IDEE 21's facilitation expertise, the work emphasises social process design, adaptive stewardship and ecological thinking. Learning is embedded in real-world initiatives — such as agricultural commons and agroforestry labs — allowing for mutual, embodied and situated knowledge exchange. Insights are synthesised into practical tools and heuristics. The approach foregrounds commoning as a dynamic, regenerative practice rather than a fixed resource framework.

The project: co-creating a commons manual and community of practice in Switzerland

This project emerges from a recognised gap between commons theory and its practical implementation. While extensive literature exists on the principles and governance of commons (Ostrom, 1990; Bollier & Helfrich, 2019), there remains a lack of practice-oriented methodologies that guide actors through the complexities of designing and sustaining commons in specific contexts. Our experience with various commons projects has suggested that commons initiatives often falter due to insufficient tools, inadequate process design and a lack of shared know-how.

In response, this initiative introduces two interconnected, early-stage interventions: 1) the co-creation of a commons manual for Switzerland and 2) the formation of a Swiss-based *Community of Practice* (Lave & Wenger, 1991). Both are currently in development and aim to bridge the gap between theory and action by integrating empirical insights from Swiss and international commons research and initiatives with grounded, practice-led experimentation.

The manual will distil actionable principles, methods and patterns derived from real-world experiences — particularly those encountered in our work at IDEE 21 and in collaboration with other initiatives. It will include participatory tools, governance diagnostics, visual frameworks and legal and cultural insights tailored to Switzerland's unique institutional and legal context. Its aim is not only to support the creation of context-sensitive commons systems but also to make the concept of *commoning* accessible and applicable across diverse domains, such as agriculture, land use, community infrastructure and digital innovation.

The Community of Practice will serve multiple functions: it will facilitate peer

exchange in different forms — written, online and in-person — across fragmented initiatives; support the iterative development of the manual; and broaden public understanding of the commons beyond their traditional association with natural resources. Our approach builds from a Swiss core of place-based exchange but is connected to a wider international circle of aligned initiatives. This arrangement enables local actors to stay rooted while sharing practices, tools and experiences across similar contexts.

Building on this practical orientation, it is worth noting that IDEE 21 has also played a catalytic role in Switzerland's broader participation landscape: in 2023, IDEE 21 co-initiated and helped launch *Participare*, the national umbrella association for participatory practices. The experience of convening and structuring this multi-stakeholder network — grounded in shared values of empowerment, inclusion and collective intelligence — directly informs the initiative. IDEE 21's team also brings a diverse range of practical experiences, with members having acted as facilitators, coaches and stewards in various commons-based projects. These include stakeholder engagement, multistakeholder governance design and fostering interdisciplinary collaboration — often in settings marked by conflicting interests and siloed expertise.

Notable examples include the Agricultural Commons project in the Canton of Vaud, where we co-developed a governance model for shared agricultural landscapes in collaboration with Prométerre and 60 farmers. This initiative strengthened both biodiversity and co-responsibility, contributing to broader policy discussions on agricultural reform. Similarly, La Sylvanière — a living lab focused on syntropic agroforestry — illustrates our commitment to practice-based experimentation and collective land care. These efforts are supported by our internal Innovation Pole, launched to incubate commons-oriented projects.

Ultimately, this initiative aims to achieve three goals: 1) to advance the concept of the commons while preserving its integrity; 2) to popularise *commoning* beyond academic circles; and 3) to equip local actors with practical tools for building resilient, equitable commons. An iterative exchange between practitioners and researchers (as a community of practice) within a specific context and the process of place-based knowledge generation (the commons manual) feed into each other. The manual does not need to be a linear or fixed document; rather, it can function as a kind of "living document" — a knowledge system akin to Wikipedia — that can be continually adjusted and expanded based on specific insights gained or contributions from new participants, rather than serving as a static and finished product.

Commoning in practice: a process overview

Commoning as a self-organising system that requires stewarding

While commons are often described as fully self-organising systems with decentralised decision-making, our experience has shown the need for some form of stewardship. This doesn't mean control, but care: an entity or person creating the conditions for collaboration, facilitating rather than leading and adapting to the needs of those involved.

A network approach can support this. Even actors with hierarchical structures — like private landowners — can be part of a commons network, as long as they're willing to think together about the whole. The region or resource becomes the focus. When participants begin to see themselves as part of a larger ecological and social fabric, individual interests often take a step back. A clear example is how wildfire risks have helped shift thinking, making landowners realise that resilience can't be achieved through isolated action.

In this kind of stewardship, the emphasis is on holding space for diverse actors to come together. Commoning is thus, at its core, a social practice. It needs intentional social-process design. Of course, this isn't without its challenges. A key observation from the IDEE 21 team is that individuals stewarding a commons often represent their own interests initially, shaped by their own diverse economic realities. We note that conflict and friction are not inherent signs of a "tragic" commons (Hardin, 1968) but are a generative part of the emergent process. Commoning asks people in Western societies to engage in ways that run counter to dominant norms of individualism, notions of ownership and control. Tensions arise out of differing capacities and experiences of dissonance when commoning in a neoliberal society. Personal attitudes and half-commitments can block momentum, but initiatives need boundaries and must take place at "appropriate" scales so that actors can come into a process of community- and identity-building around the specific commons. A stewarded process, which respects differences in expertise and lived experience, while designing for adaptability, feedback and iteration, can balance these requirements.

Because commons dissolve the boundaries between ecology, economy and culture, facilitation requires a generalist, whole-systems perspective. This means recognising where knowledge lies and connecting it — crossing silos and disciplines to build a shared understanding that is greater than the sum of its parts. A generalist perspective that can "take" from the expertise of the different actors in the commons and synthesise them provides more clarity than fragmented disciplinary views of the

same region.

Commoning as ecological thinking

Another core pillar of our approach to creating this manual is a socio-ecological perspective. The Western tradition has long separated nature and culture into two distinct spheres — one passive and determined, the other active and free. This worldview has shaped how we relate to nature: conventional conservation paradigms often uphold this dualism, displacing Indigenous peoples or assuming that humans can only harm, or at best avoid harming, ecosystems.

We approach the commons from a regenerative perspective, as true commons are inherently ecological, by deeply acknowledging that Indigenous communities around the world have stewarded a significant share of global biodiversity through similar practices. In the Amazon, for example, research shows that its extraordinary biodiversity is not solely the result of untouched wilderness but due in part to long-term, active management by Indigenous peoples (Levis et al., 2018; Beltran & Uchoa; Rainforest Foundation US, 2024). The utilitarian "do no harm" principle of sustainability is insufficient — first, because many ecosystems are already severely degraded and, second, because it implies that human-nature relationships are inherently destructive. Yet approaches like agroecology show that humans and ecosystems can exist in symbiosis. Especially in times of climate change and ecological collapse, humanity has a role to play both in downscaling its impact on ecosystems but also in helping them migrate and adapt to changing conditions that were a given in the Holocene. In commoning practice, we are always already embedded — within ecosystems and within the commons.

In a rural commons, for example, the act of stewarding resituates humans as embedded in their place and ecology — not as dominators or controllers but as participants in a larger system. The human community is part of a greater whole and must begin to see itself as such. When we understand human society as embedded within ecosystems, as ecological economics increasingly emphasises, it becomes clear that a commons project is not solely based on resources but on intricate relationships and interconnections between human and nonhuman actors.

This shift in perspective fosters a broader sense of care and belonging that transcends private, individual needs. The process of commoning — and the conversations it sparks — is itself a way for a landscape to get to know itself. Even for conventional actors like forestry businesses, this ecological perspective reveals the importance of healthy land systems and interconnections for long-term resilience and profitability.

Commoning as social learning

There's a shared recognition that people can do things together they couldn't achieve alone. A sense of empowerment emerges when a collective identity forms around a piece of land. The transformation isn't just ecological — it affects the participants themselves. The way they relate to each other and the resources being stewarded are changed through the process. Being part of a commons calls on skills often neglected in modern societies, which are shaped by enclosure — skills that are lost in individualistic, competitive cultures and that require a deep sensitivity to social processes (Bollier & Helfrich, 2019). Social relationships between actors can lead to unexpected forms of collaboration. Even when a facilitator steps back, the relationships fostered with their guidance can endure, making a region more resilient through community and mutual support. This emergent way of working builds the capacity to navigate uncertainty and identify leverage points within complex, shifting contexts.

However, this requires a shift among those involved. People often arrive with their own interests — and understandably so. Commoning requires a different way of engaging. For many, especially those shaped by capitalist norms, even the idea of a commons is unfamiliar. The process is not only about managing shared resources but also about learning how to relate differently — together. It entails experiencing, in an embodied way, that commoning is not just a shift in a kind of ownership or governance; it is learning a fundamentally different way of relating to place and to the community within it. Learning here isn't just individual reflection but something collective, something that builds relationships and community.

Conclusion: Commoning as embodied learning and transformative practice in times of polycrisis

In response to the escalating complexity of the polycrisis, we explore commoning not only as a model for governance but as a practice of social, ecological and collective learning and transformation. It shifts our orientation: from ownership to stewardship, from fragmentation to relationality and from learning as passive acquisition to learning as active co-becoming.

Conventional education often isolates thinking from doing, theory from context. In contrast, commons-based learning is relational, embodied and place-based. It cultivates capacities such as trust, adaptability, cooperation and care — crucial for navigating today's challenges. Crucially, learning in the commons is mutual and situated. It unfolds through real interactions — between people, organisations

and landscapes. When individuals, particularly those embedded in hierarchical systems, collaborate in non-hierarchical, self-organised ways, they often reimagine themselves and their institutions. Empowerment emerges not from authority but from shared responsibility and co-creation.

Commoning requires us to navigate uncomfortable and uncertain terrain. It challenges the logic of control, prediction and efficiency that underpins dominant management paradigms. Yet it is precisely within these tensions — conflict, disagreement, iteration — that deep learning and emergence occur. There are no universal templates. Commons practices are deeply contextual; they are shaped by legal, ecological and cultural conditions. Even in Switzerland, success depends on sensitivity to place. The local scale is especially generative: it allows for faster adaptation, minimised risk and deeper connection. Systems change can begin here, embedded within and despite failing institutional frameworks.

Commoning reframes our understanding of education. It sees learning as something that occurs beyond classrooms and educational institutions and includes non-traditional educators — stewards, facilitators, farmers, organisers — who co-create learning through practice. The commons itself becomes a school, and commoning becomes a method of learning in real time, grounded in lived realities. To foster the next generation of commoners, we must cultivate both tools and capacities: systems thinking, collaborative action and ecological awareness. At IDEE 21 and elsewhere, we have seen how commoning becomes a site of inquiry, not a finished solution. It is a process of learning within complexity, with others and through doing. In this sense, commoning is not simply a tool for transition — it is the terrain on which alternative ways of living, learning and being together are already emerging.

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Reclaiming pedagogies rooted in Himalayan ecologies

Anushya Pradhan and Aishwarya Pradhan*

Abstract

This paper explores the potential of a *living pedagogy*, a regenerative, place-based pedagogical framework grounded in intergenerational knowledge, place-based practice and collective responsibility, within the Himalayan context of Sikkim, India. As the region confronts intensifying climate vulnerability and a growing disconnection between young people and agrarian life, we argue that education systems must shift from maintenance learning to transformative learning.

Drawing on our conversational and transect walks[1] with farmers, the study identifies pedagogical tools rooted in traditional ecological knowledge, such as seed-saving practices, reciprocal labour systems like *Aicho Paicho* and farm-based mentorship. These tools exemplify how land-based knowledge transmission from farmer practitioners can cultivate ecological literacy, cultural continuity and community resilience among younger generations.

Rather than treating Indigenous and local knowledge systems as supplemental, this paper positions them as foundational to building climate resilience and reimagining education systems. It contributes to global debates on decolonial education and intergenerational learning by proposing mechanisms for reviving and integrating these unconventional pedagogies into contemporary frameworks. While these approaches are envisioned as complementary to formal education and embedded in extracurricular activities, we investigate community-rooted

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1 By transect walks, we refer to short, informal and participatory walks undertaken with community members through their everyday landscapes, combining observation, conversation and participatory mapping to surface place-based ecological knowledge with the land.

experiences as nonetheless integral to fostering climate consciousness and belonging among learners. By mapping the pedagogical power of intergenerational knowledge, place and seeds, underpinned by local social practices, the paper presents a vision for climate-adaptive pedagogies rooted in relationships between people, land and generations and invites broader reflection on how learning systems might reconnect with life through context-specific, relational and embodied practices.

Keywords: place-based, intergenerational, living pedagogy, transformative learning, ecological and educational justice

Introduction and context

Sikkim, a small Himalayan state in north-eastern India, has a predominantly agrarian economy and stands at the forefront of climate vulnerability. Agriculture provides livelihoods for nearly 80% of the state's population, ensuring food, nutritional and economic security (Kumar, 2012; Bhutia et al., 2014; SAPCC, 2015; Sharma & Sharma, 2017). However, small-scale farming, once central to local livelihoods and ecological balance, is now under growing stress due to environmental challenges and limited alternative employment.

Agriculture, long core to Sikkim's "organic" identity (Dorjee, 2023), depends on diverse crops like rice, buckwheat, maize, cardamom and oranges, which are deeply rooted in local ecological and cultural traditions. However, the impacts of climate change, erratic rainfall, drying springs, shifting crop cycles and pest outbreaks are disrupting traditional farming systems (Sharma & Sharma, 2017). These climate-related stresses have revealed limitations in nuanced institutional support, adaptability and knowledge transmission in the agricultural sector.

Simultaneously, younger generations are becoming increasingly disconnected from agrarian life (Singh et al., 2007). Influenced by state-run job schemes such as One Family One Job,[2] the expansion of the private sector and shifting aspirations, many young people increasingly perceive farming as labour intensive, economically insecure and socially undervalued. This disconnection is not merely economic; it is educational and epistemological. As Dewey (1899) presciently warned, separating education from lived experience erodes both individual agency and community wellbeing. That concern remains alarmingly relevant today. He thus proposed a model of education grounded in real-world, community-based activity, cautioning

2 One Family One Job is a flagship employment initiative launched by the Government of Sikkim in January 2019 with the objective of ensuring livelihood security for households lacking public sector employment.

that learning detached from everyday life would erode both personal growth and collective wellbeing.

In the Himalayan context, this divide is exacerbated by the erosion of traditional institutions and intergenerational knowledge, especially among youth (Singh et al., 2007). While official data suggest that over 40% of youth remain engaged in agriculture (Singh et al., 2007), our field observations indicate a stark contrast, with fewer than 20% of young people actively involved in farming. Both farm signals and local officials consistently highlight a noticeable decline in youth participation and interest in agricultural livelihoods.

It is evident that weakened socio-ecological relationships have made it increasingly challenging for communities to adapt to rapid environmental shifts. To deep dive into local ecology and traditional knowledge of the land, we began our conversations with farmers who revealed recurring concerns such as fading of ecological memory and collective farming traditions, which signal deeper cultural loss, and with it, a loss of resilience (Lepcha & Khaling, n.d.).

As scholars have noted, agriculture in the Eastern Himalayas reflects a co-evolution of nature and culture, a relational model that links ecology, identity and livelihoods over time (Zimmerer & Bassett, 2003; Wells, 2011; Sharma & Sharma, 2017). The ecological dimensions of these practices are inseparable from their social dimensions. Recognising this, we argue that strengthening traditional place-based knowledge, particularly through education and reimagining pedagogies, can be key to building climate-resilient communities. Documenting local practices has positively impacted sectors such as agriculture, water management, forestry, biodiversity and infrastructure (Priyadarshini & Abhilash, 2019). And transforming these knowledge systems into pedagogies can serve as a vital complement to conventional education and helping to reimagine, reclaim and foster stronger community resilience, filling the gap between younger generations and nature.

This study is an attempt to use a decolonial perspective to reframe pedagogies as a relational, context-rooted and intergenerational practice rather than a technocratic or extractive intervention. The study challenges dominant educational paradigms that separate knowledge from place, learners from land and hope from lived practice. Instead, it positions traditional ecological knowledge, seeds and everyday agrarian practices as sites of pedagogical authority, foregrounding community wisdom not as supplementary content but as the epistemic foundation of learning.

This work is part of Grounded Futures, a woman-led grassroots initiative based in Sikkim that builds regenerative futures through community-driven and place-based

education. Belonging to the region, our aim is not only to document local knowledge but to co-create, conceptualise and integrate *living pedagogy*, a pedagogical approach that centres land, lineage and learning, as practitioners. We envision this as a model that can support both ecological resilience and epistemic justice in Himalayan communities and beyond.

Purpose and process:

This study adopts a conversational, practice-based and participatory methodology grounded in decolonial and place-based pedagogical frameworks. Rather than imposing a top-down structure of inquiry, the research centres the lived experiences and ecological knowledge of farmers and young people as co-creators of knowledge. It foregrounds oral traditions, community mapping and intergenerational dialogue as valid and vital modes of learning and knowledge transmission. By positioning farming communities, particularly within Sikkim's Himalayan context, as educators and epistemic agents, the methodology challenges the extractive logics of dominant research and educational paradigms. This approach critically interrogates what constitutes legitimate knowledge within formal learning systems and advances pedagogical tools that emerge from relational, place-based and culturally rooted ways of knowing. In doing so, the research not only documents traditional practices but reimagines them as foundational elements of regenerative and transformative educational futures.

Reclaiming pedagogy: critiquing the epistemic limits of mainstream education

Intervening at the level of education offers a powerful opportunity to challenge dominant narratives around knowledge, value and progress. Within the field of climate education, Kahn (2010) critiques prevailing top-down models of "environmental education" for their failure to interrogate the systemic structures underlying ecological degradation, a concern echoed by de Rijke and Osgood (2025). In India, this critique is visible in the National Curriculum Framework for School Education (National Council of Educational Research and Training, 2023), which, despite advocating experiential, contextual and interdisciplinary learning, remains largely embedded in what Freire (1970) termed the "banking model" of education, whereby knowledge is deposited into passive recipients rather than co-produced through critical, relational dialogue.

Although recent policy documents gesture towards integrating Indigenous

and local knowledge systems, in practice such inclusion remains "tokenistic." This knowledge is often instrumentalised to illustrate concepts superficially rather than deployed to shape the epistemic foundations of curriculum and pedagogy (Maheshkumar & Soundarapandian, 2024). Knowledge embedded in agrarian and ecological lifeways is validated only when filtered through dominant scientific rationality. Vishwanathan (2024) warns that even progressive reforms risk framing traditional ecological knowledge through a deficit lens, reinforcing epistemic hierarchies that marginalise traditional or community-based wisdom.

When "environmental education" is abstracted from lived contexts and community knowledge, it limits learners' capacities to develop meaningful ecological consciousness. Environmental education, when stripped of context and community, becomes a prescriptive exercise, disconnected from land, culture and life (Gruenewald, 2003). The absence of structured pathways for integrating traditional ecological knowledge, oral histories and place-based pedagogies into mainstream curricula not only marginalises lived experience but also undermines learners' ecological consciousness (Bang et al., 2014; Kimmerer, 2002). Without intentional frameworks for dialogical and intergenerational learning, it risks becoming depoliticised, erasing the very rootedness and diversity it claims to value (Bartlett at al., 2012; Aikenhead & Michell, 2011).

This marginalisation contributes to a deeper epistemic disconnect, in which abstract, standardised curricula are privileged over relational, embodied and land-based ways of knowing (Smith, 2002; Battiste, 2013). This gap became especially evident during a three-month Engage with Nature: PermaKids workshop conducted with 5- to 12-year-old students in Gangtok, Sikkim, as part of a practice-based, participatory learning process. During a collective activity focused on preparing garden beds, an eight-year-old participant from Lachung, a village in North Sikkim, articulated detailed knowledge of growing beans and strawberries, knowledge she described as having acquired through observing her mother's farming practices on their family land. Her confidence, specificity and ease of explanation indicated a well-developed ecological literacy grounded in everyday practice and intergenerational learning. However, such forms of knowledge are rarely recognised or validated within the formal school curriculum, where learning remains largely disconnected from students' lived and place-based experiences.

Rather than an isolated instance, this interaction reflects a broader systemic pattern: when education systems disregard everyday ecological practices and community-based knowledge, they alienate children from their cultural inheritance and weaken their capacity for ecological responsibility (Simpson, 2014; Bang et al., 2018).

Reclaiming these diverse epistemologies is thus central to building regenerative and place-based education systems, particularly in the Himalayan context, where livelihoods, ecosystems and cultural knowledge are deeply entangled.

A *living pedagogy*, therefore, recognises that learning does not begin or end within institutional structures. It unfolds through daily acts of care, seeds, stories and seasonal rituals and is embedded in the rhythms of community life (Kimmerer, 2002; Gruenewald, 2003). It is this orientation that informs climate-adaptive pedagogies grounded in regenerative and transformative learning systems.

Regenerating local knowledge systems

Local and intergenerational knowledge systems are essential for cultivating sustainable, place-based strategies that support long-term socio-ecological resilience, a resilience that, as Walker et al. (2004) emphasise, "supports the capacity to absorb disturbance and reorganise while undergoing change so as to retain essentially the same function, structure, identity, and feedbacks." Traditional ecological knowledge, in this context, can be seen as a "living library" of adaptive strategies, one that connects past experiences with present challenges and offers options for renewal and innovation (Gunderson et al., 1995; Berkes et al., 2000).

Building ecological knowledge has historically been key to improving a community's chances of survival by enabling them to recognise, interpret and respond to qualitative changes in complex systems. These knowledge systems are embedded in everyday life, transmitted through oral traditions, seasonal practices, ecological memory and relationships with forests, rivers, mountains and farmlands (Moller et al., 2004).

As Smith and Sobel (2010) suggest, rooted, context-rich educational experiences cultivate lifelong stewardship and foster relational values in youth. Similarly, pedagogical experiences grounded in local and traditional ecological knowledge offer more than skills; they offer a way of being, of belonging and of navigating uncertainty with care, memory and resilience.

This interconnection between land, learning and community becomes especially critical in Himalayan contexts, where the effects of climate change are already being acutely felt. In these regions, communities have long sustained biodiversity through sophisticated and adaptive food systems rooted in traditional ecological knowledge (Food and Agriculture Organization, 2021; United Nations, 2009).

In Sikkim, many of these knowledge systems continue to be actively practised

and sustained by farming communities responding to shifting weather patterns, ecological stress and socio-economic change. However, a growing gap is emerging: while elders continue to hold and apply this knowledge, it is not being adequately transmitted to younger generations. As dominant technocratic models of environmental management prove increasingly inadequate in addressing local realities (Pimbert, 2018), the embodied wisdom embedded in local practices offers an urgently needed alternative, one grounded in reciprocity, regeneration and relational ways of knowing.

This dynamic became evident during a conversation with an NGO worker in Dzongu, a village in North Sikkim, a region regarded as sacred for its rich biodiversity, ancestral heritage and resilient communities. They described how cultural and ecological knowledge is actively sustained through the annual dry paddy cultivation festival. Beyond its symbolic and communal value, the festival functions as a living archive, reviving traditional agricultural knowledge while creating space for communities to share practices, stories and rituals. Such gatherings operate as regenerative pedagogical sites, in which intergenerational learning unfolds through embodied and participatory engagement.

As younger generations participate in planting, harvesting, storytelling and singing traditional songs, they acquire more than technical skills. They inherit ecological ethics, cultural memory and a sense of responsibility for the land. In this way, community festivals can be intentionally nurtured as intergenerational spaces of reciprocal education, blending ancestral wisdom with contemporary relevance while reinforcing community resilience through shared experience.

Seen in this light, festivals function not only as sites of cultural celebration but as pedagogical infrastructures. Documenting and supporting these forms of knowledge transmission is therefore not only urgent but deeply generative, enabling the co-creation of pedagogical tools rooted in care, kinship and ecological stewardship. Yet such embodied wisdom remains increasingly marginalised within socio-political landscapes shaped by neoliberal policies, extractive development models and ongoing processes of cultural erosion.

Extending this understanding of pedagogy beyond ritualised communal spaces, the following section examines how ecological knowledge continues to be generated, adapted and transmitted through livelihood decisions embedded in place.

As North (1990) and Berkes, Colding and Folke (2000) emphasise, ecological knowledge is deeply embedded within social institutions and local norms. This embeddedness is reflected in the account of Mr. Pemba, a farmer from Chuba,

who observes, "Our farmlands are disappearing. And as they vanish, wild animals are drawn to the few that remain." In response, he and other farmers have begun planting *amliso* (broom-grass), which also serves as a source of income, along the boundaries of their farmlands. This tall, resilient grass not only deters animals but also provides vertical support for climbing crops such as cucumbers, illustrating a layered and adaptive farming technique grounded in ecological intuition and lived experience.

While such innovations demonstrate local ingenuity, they also point to deeper ecological and cultural losses. Mr. Pemba recalls a time when expansive farmlands supported abundance and coexistence, in which humans, animals and landscapes functioned in reciprocal harmony. "Back then, wild animals weren't threats," he reflects. "They were part of the system." Today, that balance is increasingly disrupted. As farmland contracts, so too do the interlinked practices, relationships and ways of knowing that have long sustained these communities.

Importantly, such "lived knowledge" offers more than practical insight; it carries pedagogical significance. When transmitted across generations through storytelling, observation and hands-on engagement, these narratives become powerful tools for intergenerational learning. They invite younger generations to reflect on ecological interdependence, resilience and care. In this sense, place-based learning fosters a grounded sense of ecological responsibility and belonging, positioning learners as active agents within a shared and evolving ecological system.

Taken together, these instances demonstrate that pedagogy emerges through everyday place-based practices rather than solely within formal educational institutions. Farming decisions, storytelling and adaptive responses to ecological change function as pedagogical processes through which knowledge is generated, tested and transmitted across generations. When engaged as an evolving and relational practice, Traditional ecological knowledge offers a vital foundation for regenerative education. Reframing community knowledge systems as living pedagogical resources, rather than residual cultural artefacts, foregrounds their potential to cultivate ecological responsibility and inform climate-responsive, place-based learning futures.

The pedagogical power of place

To move beyond "maintenance learning" — that is, the retention and reproduction of existing dominant knowledge and skills (Davis & Francis, 2021) — which ultimately reinforces the status quo, it is necessary to re-evaluate the foundational values of education. Transformative learning capable of addressing today's urgent ecological and social challenges requires a shift away from disconnected and outdated paradigms that leave learners ill-equipped to contribute meaningfully to just and regenerative futures (Bodinet, 2016).

What is urgently required is a pedagogical shift that centres place-based, decolonial and holistic approaches to climate-adaptive education. As the Intergovernmental Panel on Climate Change (2023) affirms, "meaningful climate resilience can only emerge through educational frameworks rooted in justice, participation, and contextual knowledge." In Sikkim, existing pedagogical approaches to climate resilience raise pressing questions: how will younger generations respond to worsening environmental conditions, declining agricultural systems and increasingly fragile food ecologies? Who bears responsibility for preparing them not only with information but with place-specific ethical tools for resilience? These are not merely pedagogical concerns; they are ecological, cultural and political imperatives that demand a fundamental reimagining of what and how we learn and transmit knowledge.

Another critical gap lies in the erosion of collaborative and experiential learning within both everyday life and formal education. Models of collective responsibility, once central to agrarian systems, have steadily diminished. During one of our field conversations, Mr. Pemba, a farmer from Chuba, Sikkim, reflected on the fading practice of *Aicho Paicho* (also known as the Parma system; Rai, 2018), a traditional form of reciprocal labour exchange among farmers that functioned as a form of community-based farming.

"Earlier, we used to farm together," he recalled. "Everyone in the village helped each other on their lands. Now, with most people working in pharma companies, that tradition has stopped" (Pemba, personal communication, March 2025).

Aicho Paicho was more than a system of shared labour; it embodied a living pedagogy of mutual care, social learning and cultural continuity. Its erosion reflects not only shifts in rural livelihoods but also the weakening of communal ethics rooted in ecological cooperation and interdependence.

Reviving such intergenerational practices holds profound potential not only for agricultural resilience but for collective resilience and educational renewal. As a deeply embedded form of peer-based, land-connected learning, *Aicho Paicho* offers

valuable insight into how community-rooted pedagogies can be reintegrated into everyday life. It represents education through participation rather than abstraction, whereby knowledge flows from neighbour to neighbour and field to field across generations.

While Mr. Pemba's account reveals the erosion of shared ecological responsibility, the work of Mr. Nima, whose farm in Khimsithang, Gangtok District, is locally recognised as a space of learning, offers a glimpse into how ecological knowledge continues to be sustained and shared. His farm provides hands-on mentorship in pest control, mushroom cultivation and seasonal planting techniques. Community members regularly visit to observe and learn through practice, blending knowledge transmission with lived, experiential engagement.

Institutionally, the site is labelled as a "demo farm," primarily serving as agricultural training grounds under state-led extension programmes. This framing, however, overlooks the broader pedagogical value of the space and its role in fostering intergenerational exchange, ecological observation and embedded learning that connects people to place and tradition. Mr. Nima's farm thus illustrates how everyday spaces can function as living classrooms: sites of what we describe as *living pedagogy*, where local knowledge is actively cultivated, adapted and transmitted through relationships and practice. Recognising and supporting such spaces as pedagogical infrastructures, rather than limiting them to demonstration purposes, could significantly expand the scope of regenerative education in Himalayan contexts. These practices underscores the need for pedagogical frameworks that value lived experience, relational learning and community stewardship as core components of climate-resilient education.

Taken together, these examples illustrate the potential of place-based pedagogy to provide an appropriate scale and relevance for engaging with the complex socio-ecological challenges young people will increasingly face (Sobel, 1997). As Smith and Sobel (2010) argue, a central aim of place-based pedagogies is to help learners develop enduring bonds with their local environments and communities. It is not enough to teach young people how to learn; education must also engage them in discerning what is worth preserving and passing on across generations. In this sense, living pedagogy becomes a pathway not only for knowledge transmission but for cultural continuity, care and climate-conscious futures.

Importantly, this vision is not about adding cultural knowledge to existing learning spaces as an afterthought. Rather, pedagogy becomes an act of remembering, restoring and regenerating the ecological and cultural systems (Battiste, 2002; Smith & Sobel, 2010).

Towards a living pedagogy of seed

As Robin Wall Kimmerer (2002) emphasises, incorporating traditional ecological knowledge into environmental education not only enriches pedagogical practice but also fosters deeper ecological awareness and cross-cultural respect. While traditional ecological knowledge may diverge from dominant scientific paradigms, it offers vital insights into relational ways of knowing, seasonal rhythms and the interdependence between human and ecological systems, making it a powerful foundation for place-based and culturally responsive learning (Berkes et al., 2000).

Within this framework, the pedagogy of seed emerges as a particularly potent tool. In many Himalayan and Indigenous contexts, seeds are far more than agricultural inputs; they are dynamic repositories of cultural memory, ecological intelligence and ancestral resilience (Nabhan, 2009). Traditional seed-saving practices reflect generations of accumulated knowledge — of soil, seasons and sustenance — and are shaped through collective stewardship rooted in specific ecosystems (Zimmerer, 1996; Vernooy et al., 2015).

The pedagogy of seed thus extends learning beyond the classroom into natural ecosystems, land, eco-social realms and communal rituals, where knowledge is embodied and enacted. It encourages younger generations to view themselves not as passive recipients of information but as active stewards, caretakers and ecologically informed agents of both biological and cultural heritage. This approach cultivates ecological literacy and grounded responsibility, preparing learners to respond to the intertwined crises of environmental degradation and cultural erosion with creativity and care (Kimmerer, 2013).

Throughout this article, we have explored how local knowledge systems and intergenerational exchanges form the foundation of a *living pedagogy*. Seeds are then not only a metaphor for renewal but also a pedagogical method, teaching relationality, patience and regeneration (Kimmerer, 2013). For instance, the pedagogical flow of resilience between farmers and young people illustrates how seeds serve as "living connectors, carrying ancestral knowledge, cultivating intergenerational relationships, and opening pathways for collective adaptation amidst rapid climate change" (Zimmerer & Vanek, 2016). Rooted in traditional ecological knowledge, seed practices embody dynamic systems of learning and adaptation, passed on through embodied, seasonal and communal rhythms (Berkes et al., 2000). Learning needs the same *living pedagogies*, just as a seed does to grow organically through the care given to its environment, nutrient-rich soil, sufficient water and a balanced climate.

Similarly, we envision the co-creation of a *living pedagogy* and its supporting

ecosystem: one that does not simply transmit knowledge but cultivates it. By focusing on enabling conditions; access to meaningful information; exposure to diverse worldviews; and a responsive, supportive environment, we lay the foundation for a fertile learning culture (Wahl, 2016). By intentionally cultivating these conditions, we believe a learning ecosystem can take root, adapt and flourish in abundance. Inspired by such place-based adaptations, the pedagogy of seed is inherently adaptive, acknowledging that environmental conditions are ever changing and that resilience lies in society's ability to adjust, renew and evolve (Folke et al., 2002).

What sets this practice apart is its integrative and fluid nature: it weaves together ecological care and educational imagination, grounds community wisdom in youth agency and leadership and reorients learning towards climate resilience through a decolonial pedagogical lens. In line with Indigenous and decolonial scholars, this approach challenges extractive and hierarchical models of knowledge production, affirming learning as relational, land based and collectively sustained (Cajete, 1994; Battiste, 2002). Rather than preserving tradition as static heritage, it regenerates knowledge through living practice, deepening evolving place-based relationships that cultivate resilience, connection and shared hope.

Implications for practice

Grounded Futures seeks to affirm and amplify the lived knowledge of farmers by recognising them as vital-resource persons and co-educators capable of enacting a pedagogy of the seed grounded in local ecologies and ancestral wisdom. In reimagining pedagogies in Sikkim, we propose a shift away from top-down models towards positioning farmers as facilitators and co-learners within intergenerational learning processes. This orientation reflects our participatory, practice-based methodology, which understands knowledge as relational, embodied and collectively cultivated.

We envision an adaptive curriculum co-created through intergenerational exchange and embedded within existing "demo farms"[3] or farm schools identified by the Sikkim Government Agriculture Department. Reframing these sites as living classrooms enables regenerative learning to emerge through everyday agricultural practice, observation and dialogue. This approach fosters reciprocal relationships between food systems and education systems, allowing both to respond to climate uncertainty through context-specific and adaptive processes.

3 A "demo farm" in Sikkim refers to a "Farm School" or frontline demonstration plot introduced by the Agriculture Department and its affiliated Agricultural Technology Management Agency (ATMA).

As practitioners, our next step is to co-develop and pilot learning modules that operationalise these pedagogical tools through intergenerational seed-saving workshops, participatory storytelling and nature mapping and sensing practices. These initiatives will be introduced across community-centred farm schools and relevant local government training contexts, grounding learning in lived, place-based experience. In collaboration with local educators, elders and children, we aim to co-create a flexible curriculum that adapts across seasons and learning levels, reconnecting young people and farmers to land as a shared space of learning, care and co-creation.

While these practices may not yet be formally embedded within institutional education systems, we understand them as emergent lifelong learning tools that complement and extend existing frameworks, with the potential to inform more inclusive and regenerative educational reform.

Looking ahead, we also envision developing a digital knowledge repository as a living archive to document and circulate these pedagogical innovations. Featuring stories, tools, lesson plans and multimedia contributions from community members, this platform will support the ongoing adaptation and reimagining of locally rooted, intergenerational knowledge in response to shifting ecological and social realities.

Overall, this research advocates a shift away from extractive, top-down models of education towards regenerative, community-rooted approaches that honour local ecological wisdom and position learning as an ongoing, place-based process.

Cultivating tools for living pedagogy

To bring the concept of a *living pedagogy* to life, a pedagogy rooted in intergenerational knowledge, collective responsibility and reciprocal relationships — this study has identified several context-specific and adaptively emerging pedagogical tools rooted in place-based practices and community wisdom in Sikkim. Though still evolving, these approaches are grounded in traditional ecological knowledge and reflect social mechanisms that inform both regenerative education and alternative systems of stewardship (Berkes et al., 2000) as climate adaptive pedagogies.

Among these tools, we have highlighted:

- **Regenerative pedagogy**, which centres local knowledge systems to enable generative intergenerational knowledge exchange, nurturing ecological citizenship and civic responsibility (Sobel, 2004; Kimmerer, 2013). When lived knowledge is transmitted through storytelling and embodied practice,

it becomes a powerful medium for cultivating awareness of interdependence, resilience and care.

- **Place-based pedagogy**, which fosters a sense of belonging and collective responsibility by rooting learning in lived community experiences, such as farming practices, festivals and shared rituals (Smith & Sobel, 2010). Such grounding provides young people with a sense of purpose and a grounded connection to place.
- **Pedagogy of seed**, informed by traditional ecological knowledge, places farmers and local knowledge holders at the centre of educational transformation. It emphasises continuity, care and relational learning through practices like seed saving and seasonal observation, promoting stewardship, agency and humility (Zimmerer & Vanek, 2016; Berkes & Turner, 2006) while focusing on enabling conditions, access to meaningful information and diverse worldviews.

These frameworks are not fixed models but evolving pedagogical approaches requiring ongoing contextual adaptation. Together, they provide a hopeful foundation for reimagining education in Sikkim and other Himalayan regions, supporting agro-ecological literacy, community resilience and climate-responsive learning through place-based, experiential practices.

By documenting and theorising these community-based pedagogies, the study also aims to empower educators and practitioners to reimagine their roles not as transmitters of predefined knowledge but as facilitators of context-responsive learning ecosystems. The implications extend beyond alternative educational practices towards rethinking curriculum, policy and institutional priorities in ways that value plurality, epistemic justice and relational accountability. In doing so, this work contributes to broader conversations about how education might reclaim its role as a regenerative force capable of nurturing resilience, belonging and collective futures rooted in place.

In the context of the Anthropocene, in which climate crises are deeply entangled with histories of dispossession and ecological rupture, this research addresses the broken relationship between humans and nature by attending to how learning is embodied, seasonal and relational. Hope, here, is not imagined as a future promise but enacted through practices of care: seed saving, reciprocal labour and intergenerational mentorship, which sustain both ecological systems and social bonds. These practices offer pathways for adaptation that are locally grounded yet globally resonant. Ultimately, we argue that when pedagogies rooted in place, traditions and community complement existing pedagogies and are adapted to

contemporary realities, they offer transformative potential. Not only can they cultivate resilience in the Himalayas, but they have the potential to inspire broader educational paradigms that are participatory and life-affirming.

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Collective leadership to nurture a new democratic paradigm in remote and rural Scotland.

Alison McGrory[*] *and Ailsa Clark*

Abstract

Argyll and Bute embraces innovation out of necessity. Despite its natural beauty, including 23 inhabited islands, the region faces significant challenges like an aging and declining population, a finite public sector and a fragile economy. Partners have worked for over 15 years to nurture collective power in local communities to respond to these challenges. Having gained momentum following the pandemic, partnerships were built on a vibrant third social enterprise sector, high social capital, plentiful natural resources, plus engaged citizens.

Collaborations and partnerships have been nurtured and invested in over time to empower communities to work together on intersecting issues like health, inequality, poverty, the economy and climate. Objectives include building relationships across sectors, shifting power to local communities to reset a top-down public sector and working together to co-produce local solutions.

A cohort of 10 members formed in 2022 and expanded to a community of practice of more than 30 people from a range of sectors and locations by 2025. Financial investment from the public sector has been matched by a significant charitable grant to resource this work. Participants are developing relational working practices and community engagement skills alongside creative storytelling, which is resulting in increased reach and enthusiasm for these transformative approaches.

Looking ahead the initiative has clear priorities. Firstly, a smaller public sector with increased demands requires a theory of change involving a brave new

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social democracy. Secondly, enacting a paradigm shift can empowers and activate communities to be in control of their own destinies. In this case, it has the potential to transform decline on the fringes of Scotland to success and optimism for the future.

Keywords: remote, rural, islands, community, collective leadership, collaboration, co-production, transformation, democracy, engagement.

Introduction

Innovative and democratic collaborations have emerged throughout remote and rural areas of the west of Scotland in recent years. Often driven by the wide-ranging and interconnected challenges facing communities, these approaches are grounded in a traditional heritage of community development. These approaches, which gathered momentum after the pandemic, aim to combine collective energy and local knowledge while empowering communities to respond in coherent and person-centred ways. This participatory ethos aligns with assets-based community development (ABCD), which recognises that local people understand their own contexts and can shape solutions that improve lived experiences. ABCD approaches emphasise community strengths, local knowledge, agency and relationships as prerequisites of change, yet require design and leadership to achieve desired results (Ward, 2023).

Living in remote and rural Scotland is becoming increasingly difficult. Demographic shifts continue as people of working age migrate to urban areas, leaving aging and declining populations behind. The cost of rural living is higher, and affordable housing is scarce. These pressures increase the cost of delivering public services and make recruiting essential workers extremely challenging. Many rural communities are coastal and face heightened risks from the accelerating impacts of climate change, including more frequent and severe storms. Social democracy is also weakening, with voter turnout in local elections at historic lows; people feel disconnected from decisions that shape their everyday lives.

Traditional responses to such complex societal issues have relied on linear, top-down policy directives from local and national government. However, this approach has not produced meaningful improvements in quality-of-life indicators in rural areas or elsewhere, and it is unlikely to succeed as the scale of these challenges grows. Alongside increasingly rigid target-driven performance cultures across the public sector, there is an expectation that services must transform and modernise despite shrinking financial resources. But clarity is often lacking about what this transformation should achieve, how it should unfold over time or what investment

is needed. Underpinning this reality is a paradigm in which the state is solely responsible for addressing society's social, economic and environmental problems (Quilter-Pinner & Khan, 2023).

The work outlined in this Argyll and Bute case study challenges that assumption. It illustrates a shift towards building a complementary system of empowered communities that can respond creatively and collaboratively to local challenges. Central to this approach is the development of local skills, motivation and confidence, enabling people to work together, take action and co-create solutions that matter to them. It emphasises human relationships, investment in people and attention to how work is done rather than solely to what is delivered. This way of working, which can be traced back to emerging practices of the 2010s, gained renewed prominence after the pandemic as public health, community development, employability and economic development disciplines aligned around shared aspirations.

The World Health Organisation's Ottawa Charter for Health Promotion, published in 1986, provides a long-standing foundation for improving health and wellbeing (World Health Organization, 1986). A core tenet of this charter is the development of personal skills so that individuals can gain more control over their health, wellbeing and environment. Forty years on, there is wider recognition that collective skills, shared learning and community-wide capacity building are equally essential.

No Limits to Hope provides an opportunity to highlight creativity, resilience and vision emerging in smaller communities, which experience societal pressures earlier and more intensely than elsewhere. This Argyll and Bute collective leadership case study offers practical building blocks for other communities seeking to strengthen local relationships, bridge gaps and cultivate shared responsibility for the future. In doing so, this demonstrates how empowered communities that are supported but not dictated to by traditional systems can form a vital part of addressing the complex challenges facing society today.

Background

People, place and heritage

Argyll and Bute, located on Scotland's west coast, is home to around 86,000 people living across small towns, villages and 23 inhabited islands. Its communities are distinct, each with a strong sense of identity and place. Strong social capital and sense of belonging is evident through volunteering, community involvement and charitable activity, which exceed levels seen elsewhere in Scotland. Many residents have deep generational connections to the land, and the population is older and less ethnically diverse than the national average.

The area's coastal geography, characterised by sea lochs, peninsulas, islands, hills and mountains, results in long road journeys and reliance on ferry travel. These conditions create challenges in accessing services and complicate efforts by public agencies to deliver services.

Visitors are drawn to the natural beauty and outdoor activities such as hillwalking, sea sports and golf. Whisky tourism has expanded over the past 25 years, with Campbeltown and Islay representing two of Scotland's five whisky regions. Wider tourism brings significant economic benefits and employment, but contributes to housing pressures, as shortterm lets and second homes limit affordable housing for local people.

The economy is predominantly service based, with public services and tourism being central to local employment. Although agriculture and fishing are more common here than in other parts of Scotland, these sectors have declined markedly over the past three decades. In comparison, the aquaculture industry has expanded in recent decades, and forestry remains an important component of the rural economy. Traditional land-based occupations have decreased, but new opportunities in food and drink production have emerged. The area's geography, while posing challenges for transporting goods, is well suited to renewable energy generation aligned with global carbon reduction goals. However, most of these renewable energy projects have been developed with private investment, and little profit returns to local communities.

Argyll and Bute's history is rich and farreaching. Prehistoric sites, such as standing stones and the rock carvings at Kilmartin Glen, reveal thriving communities from the Stone Age to the Bronze Age. In 563 AD, Saint Columba arrived from Ireland via the Kintyre peninsula, establishing Christianity and founding the monastic community on Iona. The region formed part of the Gaelic kingdom of Dal Riata, which shaped cultural and political life for centuries.

In the 18th century, Inveraray became the seat of the Duke of Argyll, marking feudal land control, a system that continues to influence land ownership patterns today. Many communities across Scotland advocate for land reform to unlock local potential, a goal supported by the Scottish government but not yet fully realised. The Highland Clearances of the 19th century had a profound impact on Argyll and Bute, with villages such as Kilmory Oib and Arichonan forcibly cleared. These evictions caused widespread displacement and emigration, leaving longlasting scars on both the landscape and the ancestry of local people.

Historical events on the scale of the Highland Clearances have been conceptualised as collective trauma with effects that persist across generations, shaping current wellbeing through social, cultural and biological mechanisms. Intergenerational trauma research supports the position that population-level displacement and cultural disruption is transmitted via family and community processes and produces structural disadvantage, contributing to enduring health inequalities (Keaney et al., 2024).

Over time in Argyll and Bute, changes in land management, fewer tenants and more industrialised economic structures have encouraged a move from shared community living towards more individualised patterns of life. Despite these challenges, Argyll and Bute has retained a powerful sense of community and has been proactive in tackling inequalities in land ownership. The island of Gigha is a standout example, having moved into community ownership in 2001. Since then, the island has been revitalised, with new housing, employment opportunities and community-run enterprises contributing to a growing population that had previously been in decline.

Renewable energy has played a leading role in this transformation. Community-owned wind turbines generate electricity for the island and provide significant income. This revenue enables long-term stewardship of land and environment, benefitting both current residents and future generations. It also shows how communities can challenge extractive economic models by retaining wealth locally and reinvesting it in social and environmental wellbeing. Gigha illustrates the potential of a *wellbeing economy* approach. By shifting ownership, power and financial benefit to local people, there is potential to rebalance inequalities and enable populations to flourish (Wellbeing Economic Alliance Scotland, 2021).

Rationale for collective leadership in Argyll and Bute

Argyll and Bute experienced COVID-19 along with the rest of the world; however, remote and rural characteristics of the area had both positive and negative impacts. People living in remote locations experienced hardships such as loneliness and difficulty accessing essential supplies, yet the social capital and connectedness of tight knit communities provided fast and responsive support to people in need. Statutory resilience responses were often surpassed by large numbers of community volunteers. This approach was refined following government grant funding to community-led organisations, which enabled dynamic responses to local needs.

Recovery from the pandemic saw people return to work, and the locus for recovery shifted back to the public sector. Key personnel in this case study, however, reflected on the learning gained in the pandemic and used it to lay the foundations of new ways of working with communities. This approach was rooted in Carnegie UK action research delivered from 2010 to 2013 in Argyll and Bute, which investigated the relationship between the public sector and community-led services to map key enabling factors for successful local service delivery (Argyll and Bute Local Services Initiative, 2013).

Telling our story

Aspirations for collective and collaborative leadership gathered momentum in Argyll and Bute as pandemic recovery morphed into a growing cost of living crisis. Over a three-year period from 2022 to 2025 alliances formed, relationships developed and activity were refined. This work, although rooted in local communities, recognised the value in joining up community-led action with policymaking and strategic direction.

Intricate networks exist in rural communities, and people have many different and overlapping professional and personal roles. Within this context of place, we considered how to move from hierarchical structures to flatter lines of collaboration and, in doing so, develop the collective capacity to enable people in our communities to live a good life. A shrinking public sector, which is increasingly in demand starkly calls into question the long-term viability of living a good life in rural Scotland. But reframing resilience in terms of social capital and of community strength nurtures hope — which is key to collectively address these challenges (Carmen et al., 2022).

Building our collective leadership and skills base

Recognising the strong social capital and established relationships across Argyll and Bute, a cohort of public and thirdsector learners formed in 2022 to develop collective approaches. This included participation in an international learning group facilitated by Margaret Wheatley, whose extensive experience in systems thinking and collective leadership shaped a six-month programme. The learning combined theory with personal development, helping participants build the skills and capacities needed to support their organisations and communities (Wheatley, 2007). The value of the time invested in building trust and relationships remains evident several years on.

Building on this foundation, funding was secured in 2023 to bring Toke Møller to Argyll to deliver an Art of Hosting training[2]. This methodology supports meaningful conversations, shared understanding and collective action. The training enabled leaders from across sectors to translate theory into practice using well-established tools and approaches. By situating the work within broader systems thinking, participants were able to communicate its value more effectively and gain wider support from partners and communities.

The programme was further strengthened in 2024 with training for an expanded cohort and the establishment of a community of practice to support implementation and build confidence. This group provides peer-to-peer learning and allows new approaches to emerge organically. Momentum continued in June 2025, when 33 people took part in Scotland-wide training, half of whom were from Argyll and Bute. Interest from participants elsewhere in Scotland was inspired by Argyll and Bute's early adoption and endorsement of these approaches.

Success factors

By 2025, the collective-leadership community of practice in Argyll and Bute had matured into a confident, skilled and well-connected network capable of supporting ongoing growth. Its development, guided by light-touch leadership and modest financial investment, emerged organically over several years. The freedom to emerge naturally is widely recognised as a key factor in its success, allowing relationships, skills and shared purpose to deepen at a sustainable pace.

The initiative has benefited from the involvement of internationally respected coaches, including Margaret Wheatley and Toke Møller. Their expertise in systems

2 https://www.artofhosting.org

thinking and living-systems approaches has strengthened local confidence and capability while providing valuable mentorship as the direction of the community evolved. This external support anchored the work in global best practices while enabling local influence.

Growing pressure on public- and thirdsector organisations is necessitating alternative ways of working. Traditional hierarchical models are increasingly viewed as unsustainable, prompting organisations to look to participatory and communitycentred approaches for solutions. The complexity of contemporary challenges, including the climate emergency and widening inequality, further reinforces the need for holistic and locally grounded responses.

A further marker of success lies in the growing strength of the community of practice itself. Collective leadership approaches emphasise trust, honesty, vulnerability and the recognition that complex societal issues rarely have a single clear answer. New approaches in Argyll and Bute have been embedded in many ways — for example, through regular peer check-ins, in which practitioners support one another, share experiences and seek help across sectors, and via educational seminars to share theory and learning. This culture of mutual support and collective inquiry is enabling the deeper understanding of how to work effectively with communities on multifaceted issues and is helping the network grow in confidence, coherence and impact.

Demonstrating results

Over the three-year period of this case study there have been many examples of collective leadership practitioners embedding their newly developed skills in their immediate settings and modelling new ways of working. These examples exist in different settings, for example, multiagency statutory partnerships involved in community planning or employability; they also exist in community-led spaces involved in community resilience or wellbeing. We record these successful case studies in order to share the results of working collaboratively with communities and to provide practical examples to showcase to others how doing things differently with communities has resulted in lasting improvement.

Example 1 — Weather resilience

Argyll and Bute, like many regions worldwide, is experiencing increasingly frequent and severe weather emergencies. Its remote, rural and coastal geography means the impacts of climate change are often different, more intense and harder to anticipate (Intergovernmental Panel on Climate Change, 2022). Storm Eowyn was

the most disruptive storm to hit Scotland in over a decade. The region was badly affected by flooding and widespread loss of power, water and phone connections, with some communities disconnected for five days. In reflecting on the aftermath, many felt more could have been done during the crisis.

A community event held in the aftermath brought together local groups, volunteers and publicsector partners to consider lessons. Using collective leadership approaches, participants explored what had worked well in previous emergencies and identified ways to strengthen community resilience. The event encouraged open, honest dialogue and enabled diverse perspectives to be shared respectfully. It not only supported collective learning but also demonstrated the value of working collaboratively across sectors. A key insight was that coordinated action can help secure additional resources and strengthen climate resilience across the region.

Storm Eowyn, although unprecedented in the UK for its extent and ferocity, was another of a series of severe weather events, which with our changing climate, will grow even more frequent and intense. The learning exchange afterwards was outstanding in not only identifying a range of practical actions to reduce disruption and enhance community resilience in the face of what will be increasingly normal weather but also in promoting openness, respect and shared purpose among the participants.

Example 2 — Community drug recovery

In 2025, partners used collective leadership over six months to guide the investment of new funding into drug recovery support services. Scotland continues to experience one of the highest rates of drugrelated deaths in the Western world, with substance use closely tied to wider social determinants such as trauma and poverty. Responses to this crisis are complex and require coordinated approaches across recovery services, harm reduction and communitybased support. While additional funding is welcome, it also introduces challenges around ensuring that investment genuinely meets the needs of people affected by drug problems — that is, around governance, accountability and equitable distribution.

In one area of Argyll and Bute, £80,000 was allocated to strengthen wholesystem support. Partners recognised that historically, distributing such funds had been difficult, particularly when multiple organisations were involved and competition created unhelpful boundaries between services. The collective leadership approach provided an opportunity to work collaboratively towards an agreed investment plan.

Two in-person sessions and four online meetings took place, facilitated by an independent community-development practitioner who was viewed as neutral by

all parties. This extended process allowed participants to understand the complexity of local services from the perspective of someone trying to access support. Through this shared lens, the group codesigned a grant process that enabled partners to bid to host a development worker for three years; provide a suitable base for the role; and commission independent evaluation. The group also adopted a broader shift towards personcentred service delivery and began developing a local manifesto to guide future collaboration across the system. One of the facilitators said:

As a facilitator, the Art of Hosting methods enabled the group to gain a joint understanding of the issues, agree priorities, consider practical options and build a consensus for their next steps. It was interesting to see that people recognised the transparency of the process. While there wasn't always agreement, there was respect for the consensus they were part of and saw develop over time.

Example 3 — Implementing national strategy on an island

The communities of Argyll and Bute have distinct characteristics compared with the rest of Scotland, yet most national strategies are designed from an urban perspective. This creates extra work for local statutory partners, who must reinterpret national policy for rural delivery. One example in the health policy context is community-link workers, who support people in general practice with underlying social issues such as loneliness, financial concerns or housing problems. Link workers offer appointments over weeks and months to help individuals develop selfmanagement plans.

National policy places link workers in areas of concentrated high deprivation. However, deprivation in rural areas manifests differently than they do in urban areas, and some rural general practices reported that link workers would not be a useful resource. To address this gap, national research funding was made available to Argyll and Bute partners to build on the limited evidence base. Collective leadership methods explored these issues with community participants, whose insights supported the value of link working in rural areas, albeit in a different format. One of the facilitators said:

> *"Good community engagement is essential for developing a strong rural-link working model, as it ensures that local voices are heard, local needs are identified and communities are involved in local decision-making. By building trust and nurturing collaboration, good community engagement helps tailor services to the unique context of rural areas, ultimately helps to reduce health inequalities, improve access to services and have meaningful outcomes."*

Dreaming big — next steps

People living and working in areas shaped by societal problems need hope that their aspirations are not in vain. Working harder to find elusive solutions to systemic problems is not the answer. Hope arises from transformation rather than incremental change, with coherence around an aligning vision. In Argyll and Bute, that theory of change centres on communities thriving rather than declining, with place, relationship, advocacy and a fair and just economy at its heart. By 2025, the collective leadership work in Argyll and Bute reached a tipping point, providing ways of working with tangible next steps based on collaborating better with people.

A central learning from this case study is that relational working in community development is not an optional extra (Redvers et al., 2024). This is the infrastructure that makes whole system change possible. In rural and island contexts, where roles overlap and capacity is stretched, trusted relationships enable faster coordination, better decisions and more sustainable action. Meaningful progress has emerged through a community of practice that can hold complexity with humility. This way of working requires comfort with uncertainty and faith that the right next step can be discovered through listening, convening and learning together, rather than imposed through a fixed plan.

Argyll and Bute's challenges interact and compound each other, and linear, top-down responses can fragment larger efforts and reinforce silos. Collective leadership brings public sector, third sector and community partners into shared spaces where they can build a joint understanding, agree on priorities and take coordinated action in order to shift from a narrow problem-focused response to a wider systems thinking approach (Gadsby & Wilding, 2024). The examples in this report show that this approach can lessen obstructive boundaries between services, strengthen person-centred responses and improve the fit between national strategy and rural reality.

Several success factors have been particularly important in Argyll and Bute. Committed leaders have been present for more than ten years and they live and work locally, providing continuity and belief in the area's potential. There has also been a shared confidence that things can be better when we work differently, and this shared vision has helped partners stay the course when outcomes were difficult to express through conventional measures. Modest funding has been enough when used wisely, enabling convening, facilitation, education and coordination. Wider structures, including the community of practice, have enabled the work to be shared rather than held by one organisation. Storytelling has helped translate learning into practical examples and build momentum across communities. This is reflected in

Communities Working Together, which positions itself as a movement that invests in people, relationships and place, and shares its journey through an accessible public narrative (Living Well in Argyll and Bute, 2025).

Looking ahead, future success depends on widening capability while keeping values at the centre. This includes continuing education and training, strengthening the community of practice and showcasing success so others can see the potential of doing things differently. The work also needs to be consistently values driven and include trust, equity, empathy and honesty; the commitment to collaborate over time must be maintained in recognition that relationships are inherent to the success of any project. There is value in using collective leadership to strengthen progressive democratic models that pass power to communities, including wellbeing-economy approaches and fairer redistribution of wealth. This requires a sustained commitment from public services to work *with* communities rather than *for* communities and reassurance that emergence can be accountable without being measured against narrow targets.

The work outlined in this case study can be easily replicated in other areas, given important key elements; indeed, partners have already been sharing this learning throughout Scotland and internationally. These key elements include staff capacity; space and time to nurture and develop relationships; investment of time and funding; agreed vision; a clear methodology; and a commitment to record and share the outputs of the work. While the work in Argyll and Bute may not be wholly quantifiable in traditional empirical terms, it can be evaluated through simple indicators that reflect its purpose, including trust and collaboration, access and inclusion, networks and partnerships, and innovation and commitment. Importantly, replication in other areas must have a strong foundation of shared aspirations and rely on community power rather than external frameworks, principles rather than procedures and relationships rather than structures. Further information on replicating this work can be found in Annex 1.

In conclusion, Argyll and Bute has a rich heritage of communal approaches to survival. In this context, social capital, including kindness, care, compassion and connectedness, remains our single biggest asset. Building from and with this social capital in order to grow collective-leadership capacity is a pioneering strategy for responding to complex challenges in our rural and island communities. Collective leadership takes bravery because it requires doing things differently and staying faithful to the idea that a positive future is possible as long as the wealth of people, relationships and community are tapped. There is no limit to the hope that can emerge from the collective will and energies of local people, when they are nurtured through

connection, education and learning. And this hope enables communities not only to cope with change but to imagine and create a future grounded in wellbeing, justice, equity and shared responsibilities.

Annex 1: Learning framework for replicating collective leadership elsewhere

This annex is an invitation, not a template. It distils what travelled well from Argyll and Bute's experience, so other places can adapt the approach within their own context.

Purpose and stance

Work relationally, not transactionally. Prioritise trust, belonging and shared purpose as the conditions for change. Treat plans as hypotheses; let direction emerge from inquiry, listening and doing, rather than from a fixed blueprint.

Guiding principles

- Relational foundations: Build psychological safety; make time for checkins, reflection and storytelling.
- Emergent practice: Focus on the "next wise step" and document decisions openly so learning compounds.
- Wholesystem convening: Bring together community members, public services and third-sector partners who may not usually meet; centre lived and placebased knowledge.
- Power with communities: Share agenda setting and decisions; support participation (travel, timing, digital access, care costs).
- Transparency: Harvest what was heard, learnt and agreed; publish short, accessible notes.

Lighttouch scaffolding

Hold the work with minimal structure: develop a shared purpose statement that can evolve; cocreate ground rules; keep a simple decision log; agree to proportionate accountability. Keep facilitation neutral where resources are allocated.

Practical roles (adapt, don't adopt)

Someone to convene and connect; a trusted facilitator; light administrative

support; named partner contacts with protected time. These roles can be distributed across organisations and community groups.

Learning signals (not performance targets)

Are people feeling heard and respected? Are new crossboundary relationships and actions emerging? Are community voices shaping decisions? Are barriers to participation reducing? Use brief pulse checks and short stories of change to notice progress.

Invitation

Start where you are. Convene a first conversation, agree to the next step and make the learning visible. Let relationships do the heavy lifting; let context shape the form.

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The power of paradigms: recentring First Nations ways of knowing, doing and being for sustainability

Jacqueline Colmar and Katherine von Stackelberg*

Abstract

Humans have developed the concept of sustainability to describe actions that maintain the quality of life for current generations without undermining future generations' ability to meet their own needs. However, operationalising this vision is challenging given the diversity of values shaping its implementation. As the economy, which is embedded in society, which is embedded in nature continues on a business as usual trajectory, the risk of polycrisis grows.

The current global social-ecological system is extractive, polluting and prioritises monetised economic growth within a constrained biophysical system. A circular economy seeks to decouple growth from environmental degradation and non-renewable resource use, but whether it can achieve sustainability without a paradigm shift remains unclear. First Nations communities in Australia are known to hold a different human-nature paradigm to business as usual and have supported health and wellbeing within planetary boundaries for over 65,000 years. This article qualitatively compares these three social-ecological systems to explore how paradigms shape sustainability outcomes and the implications for sustainability learning and education.

Using systems modelling, we show that sustainability requires solutions that directly address the human-nature relationship and that reframe the paradigms underpinning education and economic systems. Our theoretical framework and high-level models reveal how a flawed human-nature relationship undermines

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system sustainability. We then explore learning and knowledge across systems, with particular emphasis on First Nations ways of knowing, doing and being. Grounded in relational responsibility, connectedness and complexity, these approaches offer clear principles for designing social-ecological systems that sustain both people and the planet — but achieving this shift first requires recentring First Nations voices and knowledge, including in education.

Keywords: sustainability, human-nature relationship, First Nations, economic systems thinking, ecology

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As non-Indigenous authors, we are not holders of traditional knowledge. We draw on publicly shared work by First Nations scholars, leaders and communities, and on Colmar's experience working alongside First Nations communities. We use the term "First Nations" to refer to Aboriginal and Torres Strait Islander peoples across Australia and the Torres Strait, recognising their enduring custodianship of the land, seas and skies.

Since violent colonisation, First Nations knowledge has been dismissed as primitive, but it is now increasingly recognised as critical to addressing climate and biodiversity crises. It is with both irony and reckoning that non-Indigenous communities who once silenced these voices must now seek their guidance. A sustainable and just future demands genuine partnership, built on deep listening, truth-telling, decolonisation, power-sharing and advocating for First Nations self-determination and sovereignty.

Introduction

Social-ecological systems are complex, interconnected systems in which humans are explicitly recognised as an intrinsic part of nature (Berkes & Folke, 1998). Since the Anthropocene began, accelerating climate change, biodiversity loss and other human-driven pressures have increasingly strained social-ecological systems (Steffen et al., 2018), threatening economic structures, supply chains, human wellbeing and life itself. Due to the emergent properties of social-ecological systems, shifting systems can produce unexpected and sometimes irreversible outcomes (Meadows, 1999). This highlights the need to understand how to avoid systems change and potential collapse triggered by environmental degradation and reduce the harmful impacts of a destabilised system.

Today, humanity is pushing Earth far past its biophysical limits through production, consumption and waste generation (Intergovernmental Panel on Climate Change, 2022). The instability of our social-ecological systems is so great that the term polycrisis — the multiple extreme emergencies requiring urgent response — is now used to describe our current status (Lawrence et al., 2024). The planetary boundaries framework lists nine environmental thresholds required to maintain current life, and as of 2025, seven of the nine boundaries have been exceeded (Planetary Boundaries Science, 2025), pushing ecosystems to the brink of collapse (Ekins & Gupta, 2019).

So why haven't we made progress on sustainability — that is, Earth system stability that achieves human wellbeing within planetary boundaries (Richardson et al., 2023)? A key explanation is that interventions often focus on symptoms and responding to events rather than on deeper system structures such as beliefs and values — an approach that results in superficial solutions (Meadows, 1999). Societies operate within dominant paradigms, or shared worldviews, that shape how social, economic, political and environmental issues are addressed. Reinforced through education (van Egmond & de Vries, 2011, as cited in Kennedy at al., 2020), these paradigms are closely linked to underlying human-nature relationship types (Kantartzis & Molineux, 2011, as cited in Bogert et al., 2022). This work explores how these relationships differ across three defined systems and the implications for sustainability and learning.

Methods

We first identified three high-level conceptual systems describing different ways humans organise themselves: business as usual representing the current status quo for

the bulk of the global economy; circular economy, a frequently promoted sustainability response to business as usual; and a First Nations system, with a structure that differs profoundly from that of business as usual and circular economy.

We then extracted literature-based data for each system across five themes — system goals, system structure and components, and economic, social and environmental traits — using the 39-question social-ecological system structural analysis framework,[1] a systematic and replicable process developed and applied in Colmar (2025). Each system was then presented visually using causal loop diagrams mapped in Kumu following methods established by Haraldsson (2004), Barbrook-Johnson and Penn (2022) and Lawrence (2024). In these maps, nodes represent key system variables, arrows indicate causal relationships (blue arrows represent reinforcing effects while red arrows represent balancing effects), and feedback loops are labelled R1, R2, etc. for reinforcing and B1, B2, etc. for balancing.

To characterise each system's human-nature relationship paradigm, we applied Bogert et al.'s (2022) framework, which identifies 12 distinct relationship types (e.g. mastery, utilisation, stewardship, etc.) defined by combinations of the human-nature divide (separate, equal, interrelated), core values (instrumental, relational, intrinsic) and levels of ecocentrism or anthropocentrism. This framework was then used to explore differences across systems and implications for system behaviour.

Finally, we conducted a review of First Nations ways of knowing, doing, being and learning to understand how this human-nature paradigm influences knowledge systems and educational practices. This step aimed to identify principles to inform more impactful approaches to sustainability interventions and education.

Results

System 1: Business as usual

The business as usual social-ecological system represents the dominant social paradigm underpinning current and historical global economic, social and environmental activity. It is characterised by industrialisation, neoliberalism, colonisation and globalisation grounded in an anthropocentric human-nature relationship, in which people are separate to nature and nature serves as a resource for economic activity (Steinberg, 1986; Bogert et al., 2022). Within this system,

1 The complete framework, including its development process, questions and the use of the framework are provided in Colmar, J. (2025). The transformative power of paradigms: How shifting the human–nature relationship impacts social-ecological systems (Publication No. 3218435694) [Master's thesis, Harvard Extension School, Harvard University]. ProQuest Dissertations & Theses Global.

economic growth, which is measured through, for example, gross domestic product (Kotz, 2010), is treated as the primary indicator of progress, health and wellbeing. Markets are driven by supply and demand, whereby, it is assumed, rational, self-interested individuals maximise utility and profits, with monetised profits serving as an indicator of utility (de Vries, 2012).

Core characteristics of the business as usual system include:

- System goals: Continuous economic growth measured in gross domestic product (Ekins & Gupta, 2019).
- Human-nature relationship: People are separate from and dominant over nature, which is viewed as a resource to be used for economic gain (Diesendorf et al., 2024).
- Wellbeing: Assumed to increase as gross domestic product increases (Tapia Granados & Ionides, 2008).
- Provisioning, extraction and consumption: Human needs are met through large-scale extraction, production and high levels of consumption of virgin materials and fossil fuels (Ekins & Gupta, 2019).
- Distribution and inequality: Resources and wealth are distributed through markets, which contain structural inequalities (Diesendorf et al., 2024).
- Accumulation: Accumulation of capital as monetised profit and monetary wealth is prioritised (Wilkie & Young, 2009).
- Limits: Ecological limits are treated as constraints to be overcome through technological and social innovation rather than as a fixed system boundary (Liodakis, 2016).
- Concept of time: Short-term thinking dominates decision-making (Fusso, 2013).
- Values and priorities: Individualism, competition, efficiency and financial success (Fiss, 1992; Kasser et al., 2007, as cited in Butler, 2019).

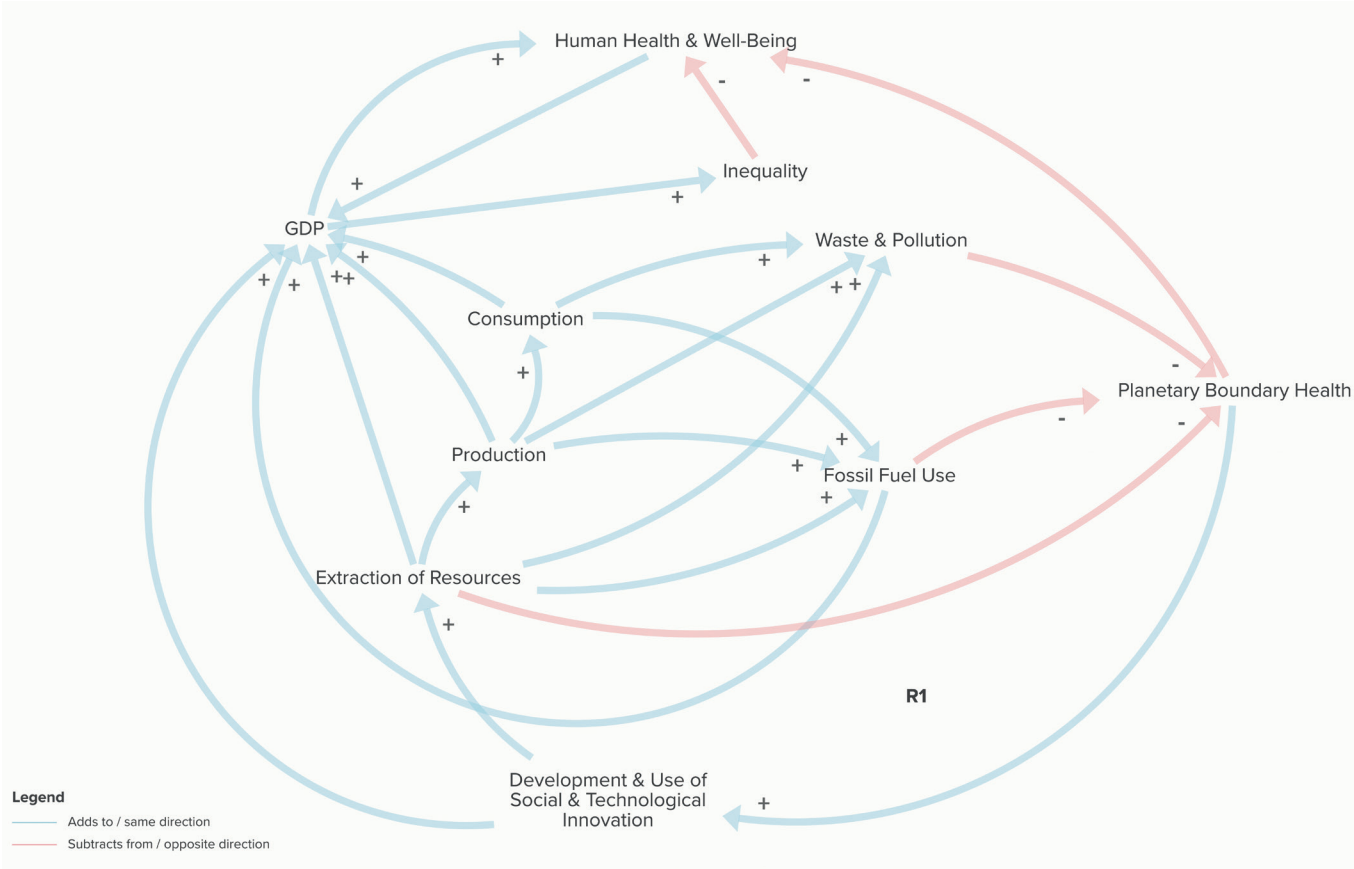


Figure 1: Systems map of business as usual social-ecological system

The business as usual systems map (Figure 1) shows the reinforcing dynamic between economic growth and planetary boundary health. The system depends on resource extraction, production and consumption to drive gross domestic product growth, which inevitably pushes against planetary boundary limits (Richardson et al., 2023). When environmental limits are reached, social and technological innovation is used to overcome constraints and sustain resource extraction and consumption, reinforcing feedback loops that further degrade planetary boundary health, with no internal balancing mechanisms.

System 2: Circular economy

The circular economy is promoted as a more sustainable alternative to business as usual, seeking to reduce environmental degradation while maintaining economic growth (Ellen MacArthur Foundation, n.d.-a). Circular economy emerges from the recognition that business as usual has contributed to climate change, biodiversity loss, pollution and more (European Environment Agency, 2024; Organisation for Economic Co-operation and Development, 2021) and attempts to address this by redesigning production, consumption and energy systems including transitioning from fossil fuels to renewable energy (Ellen MacArthur Foundation, 2019). However, circular economy retains key features of business as usual, including a growth-oriented economic model and technological optimism.

Core characteristics of the circular economy system include:

- System goals: Continued economic growth (Dzhengiz et al., 2023), with a secondary goal of reducing environmental harm through circular design and resource efficiency (Ellen MacArthur Foundation, n.d.-b).
- Human-nature relationship: Humans are separate from nature but dependent on ecosystems and ecosystem services, which are treated as resources to be managed (Ellen MacArthur Foundation, 2021).
- Wellbeing: Achieved through economic growth, with the assumption that reducing environmental harm will sustain ecosystem services that support human wellbeing (Ellen MacArthur Foundation, n.d.-c).
- Provisioning, extraction and consumption: Similar to business as usual, with an added focus on repair, reuse, recycling and waste reduction (Korhonen et al., 2018).
- Distribution and inequality: Distribution remains market-based, with existing inequalities largely unaddressed (Schröder et al., 2020).

- Accumulation: Accumulation and growth of monetised profit remain central (Tóth, 2019).
- Limits: Environmental limits treated as manageable through efficiency gains, technological innovation, partial decoupling and regeneration, rather than as fixed boundaries (Liodakis, 2016).
- Concept of time: Short-term to medium-term thinking is dominant, prioritising near-term economic performance alongside future-oriented environmental goals (Lupikawaty, 2025).
- Values and priorities: Efficiency, optimisation, innovation, environmental management and economic growth (Geissdoerfer et al., 2017).

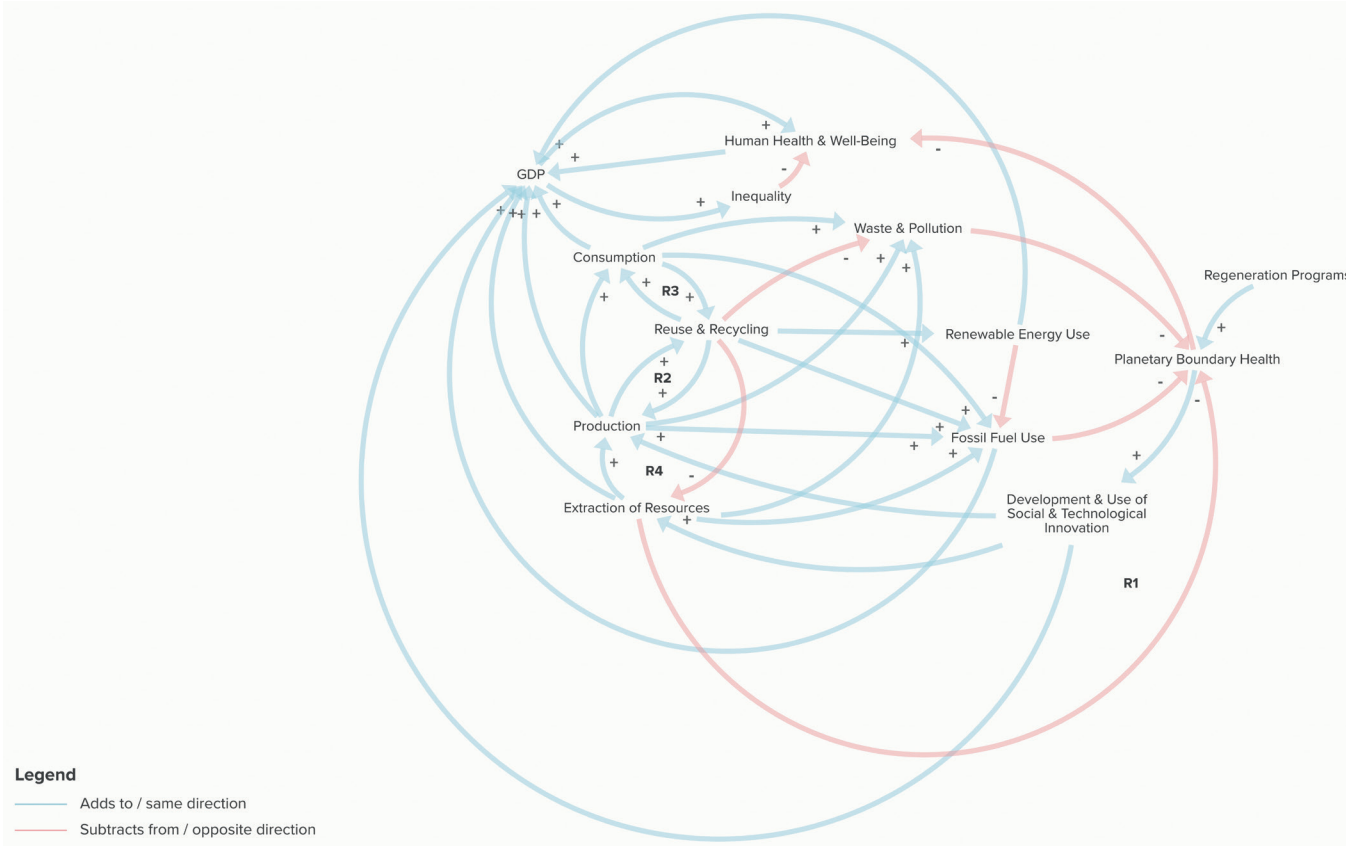


Figure 2: Systems map of circular economy social-ecological system

The circular economy systems map (Figure 2) appears structurally very similar to business as usual, with additional interventions aimed at slowing environmental degradation. While circular production, regeneration programmes and renewable energy transitions reduce the rate of planetary boundary decline, gross domestic product growth continues to drive extraction, production and consumption. Constraints including entropy and ongoing material and energy requirements also limit the potential for full decoupling (Dzhengiz et al., 2023). As a result, circular economy slows environmental degradation compared to business as usual but does not prevent it.

System 3: First Nations

First Nations culture in Australia has continued for over 65,000 years, making it the oldest surviving culture in the world. Across highly diverse and environmentally variable landscapes, these communities have sustained life through deep ecological knowledge and resilience. Prior to colonisation, hundreds of First Nations existed with distinct languages, cultures and governance structures (Australian Institute of Aboriginal and Torres Strait Islander Studies, 2020). While diverse, First Nations ways of knowing, doing and being share foundational principles that shape social, economic and environmental interactions in ways that fundamentally differ from business as usual and circular economy.

Several key concepts underpin this system, including country, the dreaming, songlines and kinship. At the core of First Nations culture is the concept of country, understood as a living entity with agency and that includes land, culture, knowledge and spiritual identity (Langton, 2018). Caring for country is a core feature of First Nations societies, ensuring both human and environmental wellbeing. People are embedded within country and are bound by reciprocal responsibilities that connect individual, collective and ecological wellbeing (Bird Rose, 2000).

The dreaming refers to a collective spiritual identity across all, providing guidance, law and knowledge that connects past, present and future. Country is said to have dreaming, and the country is dreaming (Sims & Davis, 2018). Songlines function as place-based knowledge systems embedded in the land. Visualised as corridors or pathways of knowledge, like dreaming tracks, they form a network of story places, in which knowledge is embedded, like a library, frequently associated with animals, events and natural elements. Meanwhile kinship systems define relationships, roles and responsibilities that reinforce concepts of reciprocity, care and sustainability across all (Neale & Kelly, 2020). Communities can often consist of multiple kinship groups which provide people with meaning, a sense of place, security, safety and wellbeing (Graham, 1999).

Unlike business as usual and circular economy, the First Nations social-ecological system does not contain an independent economic subsystem oriented towards growth or accumulation. Provisioning and resource use are embedded within relationships between people, country and kin, with cultural protocols ensuring ecological limits are respected and collective wellbeing prioritised over individual gain (Sims & Davis, 2018). Economic organisation is therefore relational and needs based rather than extractive or growth driven.

Core characteristics of the First Nations social-ecological system include:

- System goals: A healthy relationship between country and people, and healthy relationships among people (Graham, 1999).
- Human-nature relationship: All living things are deeply interrelated, with relational and intrinsic values and high ecocentrism (Bird Rose, 2000).
- Wellbeing: Comes from a sense of belonging and place and balanced relationships with country, community and kin (Slife, 2004, as cited in Stocker et al., 2015).
- Provisioning, extraction and consumption: Needs are met through subsistence living that respects ecological limits and works with nature, its rhythms and the land (Neale & Kelly, 2020).
- Distribution and inequality: Resources are shared across family and community, with a focus on reducing inequality and ensuring harmonious relationships (Langton, 2018).
- Accumulation: Accumulation beyond immediate need is limited. Surplus is shared or stored collectively rather than privately accumulated (Neale & Kelly, 2020).
- Limits: Ecological limits are embedded within culture and law. Nature cannot be controlled, and consumption is governed by cultural obligations to care for country and steward environmental, cultural, intellectual, spiritual and human resources (Stocker et al., 2015).
- Concept of time: Long-term, intergenerational thinking is foundational (Bird Rose, 2000).
- Values and priorities: Collective wellbeing, reciprocity, responsibility and sharing, with individualism and competition seen as lonely and dangerous (Graham, 1999).

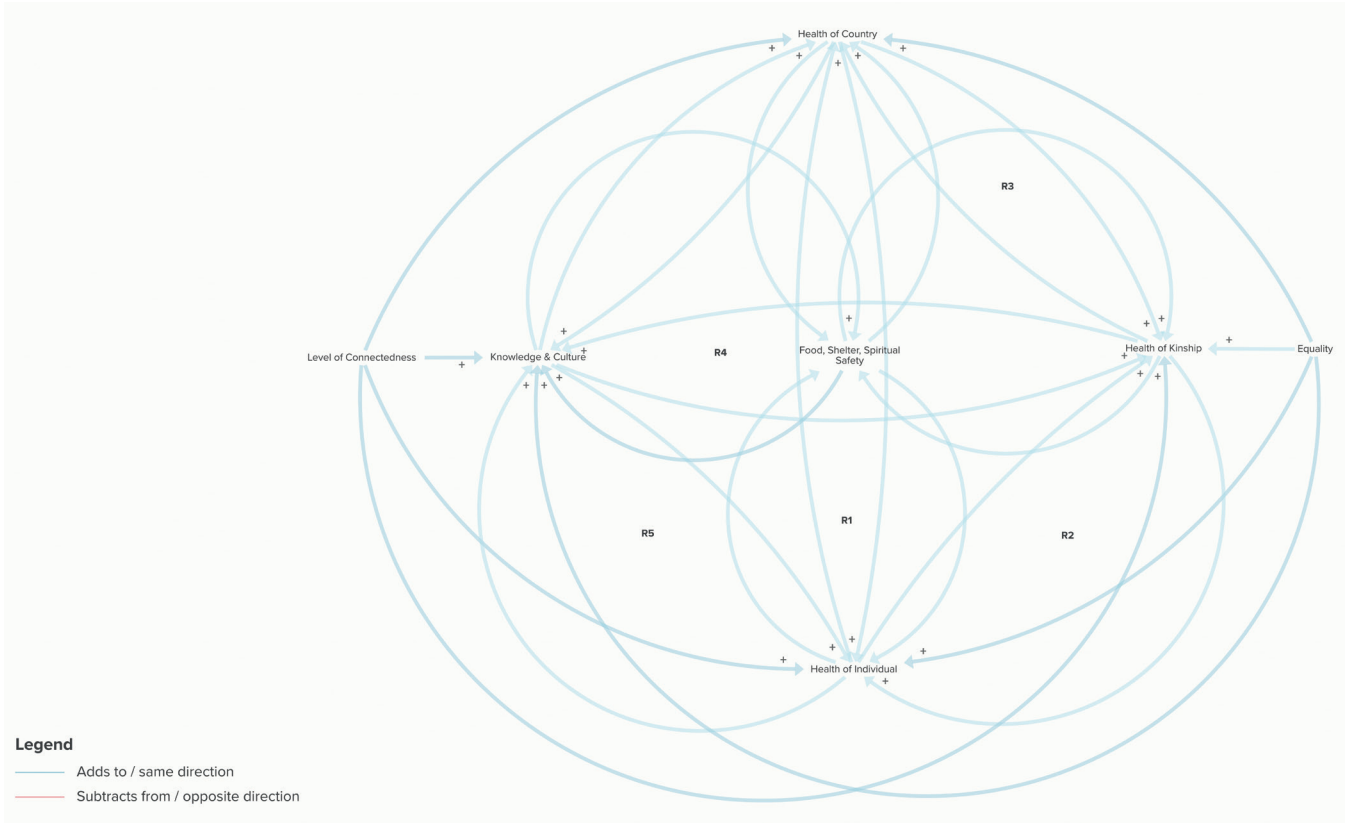


Figure 3: Systems map of First Nations social-ecological system

The systems map for First Nations (Figure 3) is visually distinct from business as usual and circular economy reflecting a fundamentally different organising logic. Rather than centring economic growth, system dynamics are organised around relationships that foster the health of country, community and individuals. As the health of country increases, individual and collective wellbeing also increases, strengthening stewardship and care for country. Although represented as reinforcing feedback loops, these dynamics are inherently self-regulating because ecological limits and relational responsibilities are embedded in the foundation of the system. As a result, the system is structured to prevent environmental degradation rather than respond to it retrospectively — thus, supporting long-term sustainability.

Unlike business as usual and circular economy, in which economic growth is prioritised and environmental harm is managed reactively, the First Nations social-ecological system is structured to prevent degradation through needs-based provisioning, respect for ecological limits and collective wellbeing rather than growth and accumulation. Economic organisation is embedded within relationships between people, country and kin rather than operating as an individual subsystem. These reinforcing feedback loops are inherently balanced, and the term "reinforcing" visually represents how the system interacts across variables by strengthening the connections between them.

Human-nature relationships: impacts across systems

Applying Bogert et al.'s (2022) framework reveals clear human-nature paradigms that shape system behaviour. business as usual aligns with *mastery*; humans view nature as separate, often employing anthropocentrism and acting in accordance with instrumental values. Within this paradigm, nature is treated as external to human wellbeing and valued primarily as a resource for economic gain. Environmental degradation is therefore framed as a problem to be solved through social and technological innovation in order to maintain economic growth. As planetary boundaries are not seen as structural system constraints, meeting and exceeding them does not trigger system correction; instead, the system continues until scarcity or collapse.

Circular economy reflects a mixed paradigm aligned with *stewardship* and *utilisation*. While circular economy acknowledges human dependence on nature, incorporates regenerative elements and aims to reduce degradation through measures including recycling and renewable energy, its primary goal remains gross domestic product growth. Environmental limits therefore are not structurally embedded, and social and technological innovation is relied upon to reduce harm

without addressing the underlying causes of overproduction and consumption. So while circular economy slows environmental degradation, it does not prevent it, reinforcing the same extractive logic — but applying it more efficiently.

In contrast, the First Nations system aligns with the *holistic* category, demonstrating ecocentrism and applying relational and intrinsic values. Humans and nature are understood as deeply interrelated, and human, ecological and community wellbeing are inseparable. Environmental degradation therefore undermines the health of the entire system and is avoided by design. Rather than seeking to repair harm, the system is structured to prevent it, resulting in a relational and resilient system that is designed to sustain life.

The differences in these paradigms are also reflected in how wellbeing is understood and pursued. In business as usual and circular economy, wellbeing is proxied through economic growth, despite evidence that increases in wellbeing are uneven (Diesendorf et al., 2024) and that there is an inverse relationship between happiness and gross domestic product (Easterlin et al., 2010). In contrast, the First Nations social-ecological system frames wellbeing as a relational outcome achieved through balanced relationships with Country, culture, community and kin, rather than from economic growth or increased consumption.

Implications for learning and education: First Nations ways of knowing, doing and being

The paradigms that underpin systems shape not only feedback and structures, but also how knowledge is created, shared and embodied. While this article does not aim to comprehensively represent First Nations knowledge systems, particularly as the authors are not First Nations people, several reflections emerged from our exploration. These insights show how the First Nations human-nature paradigm, grounded in interconnectedness, ecocentrism, and relational and intrinsic values, shapes learning and knowledge practices, and offers a useful contrast to dominant approaches found in business as usual and circular economy.

In First Nations communities, where interconnectedness and relationality are foundational, knowledge systems reflect a profound relationship with Country. Language offers one glimpse into this connection. In many First Nations cultures, language is not simply a tool for communication but is linked to land or a region and is an essential part of collective and individual identity. Each spoken word helps maintain spiritual harmony with Country (Williams, 2011). Knowledge is also considered valuable and legitimate when it resonates with the being and is felt

to be true. This embodied sense of knowing is grounded in relational experience and differs significantly from Eurocentric models that prioritise testability and the separation of mind, body and spirit (Hughes & Laura, 2017).

Teaching and learning are guided by relational responsibility, according to which people and relationships, including those with Country and kin, come first. This is clearly reflected in the 8 Ways First Nations learning pedagogy. Centring people, Country and community, it requires relational responsiveness: a protocol of working with integrity to honour the specific people, places and responsibilities one is accountable to. The framework has eight interwoven elements: story sharing (connecting through sharing stories), learning maps (visualising processes to picture knowledge pathways), non-verbal (connecting with knowledge reflectively, critically, ancestrally and physically), symbols and images (encoding ideas visually), land links (place-based learning from community, land and nature), nonlinear (thinking in cycles and systems), deconstruction and reconstruction (working from wholes to parts) and community links (returning knowledge for community benefit) (Yunkaporta, 2009). One example of how story sharing, the non-verbal and land links are achieved is apparent in Dadirri, a practice of deep listening, reflection and stillness rooted in Ngangiwumirr culture. Passed down through generations, Dadirri teaches people to sit in stillness and reconnect with self, others and Country as a way of learning and understanding (Miriam Rose Foundation, n.d.).

Learning is also nonlinear. In First Nations cultures the winding path is the norm, reflected in the paths of rivers, creeks and streams. In one First Nation story, a man who attempted to walk in a straight line thousands of years ago was called *wamba* (crazy) and punished by being thrown into the sky (Yunkaporta, 2019). This story highlights the value placed on the journey, rather than the destination, in contrast to dominant learning models that prioritise outcomes such as test scores and efficiency. In the Gamilaraay worldview, this is embedded in language; the word *manila-y*, means to hunt, search and find all at the same time, emphasising process over the end result (Ash, Giacon, & Lissarrague, 2003, as cited in Yunkaporta & McGinty, 2009).

Knowledge itself is deeply interconnected rather than siloed, with meaning emerging through relationships, context and practice. When knowledge is fragmented, its complexity is diminished in ways that undermine its capacity to sustain life. Instead, relational knowledge systems sustain life with their dynamism, adaptivity and interconnectedness (McNiven & Russell, 2020).

Finally, the First Nations social-ecological system is oriented towards optimisation rather than maximisation. This also shows up in learning, where the goal is not to maximise individual knowledge but to optimise learning across community.

Knowledge serves collective wellbeing and ensures the right relationship between people, spirit, Country and future generations.

Together, these ways of knowing, doing and being offer critical insights into how First Nations systems have sustained life in harmony with nature over time, reflecting and embodying the principles of the natural systems they are embedded within.

Discussion

Key findings reveal that business as usual demonstrates a clear human-nature divide, high anthropocentrism and instrumental values towards nature. Circular economy presents a mixed human-nature divide; it acknowledges some dependence on ecosystems but is still grounded in instrumental and anthropocentric values. In contrast, First Nations systems reflect deep interconnectedness, ecocentrism and relational and intrinsic values.

These paradigms shape system behaviour. In business as usual, nature is external to human wellbeing and valued primarily for economic gain, leading to environmental degradation, which can only be solved through innovation so that growth can continue. Circular economy seeks to reduce harm through regenerative design and decoupling but still prioritises gross domestic product and relies on technological innovation, creating a system that has the same extractive logic, if articulated in more efficient form.

First Nations systems achieve wellbeing through balance, not economic growth. Feedback loops are structured to prevent degradation in the first place, which creates highly connected, reinforcing feedback loops where health is seen as shared across people, community and Country, ensuring resilience and self-regulation. The imperialist, colonialist and extractive economy embedded in nature, which is the basis of business as usual and circular economy, fundamentally does not exist in First Nations.

A core distinction is the relationship to planetary boundaries in each system. In business as usual and circular economy, limits represent constraints to be overcome. circular economy aims to reduce harm through innovation, but still assumes that limits can be exceeded, at least temporarily. The irreversibility of biodiversity loss and climate tipping points remain unacknowledged in business as usual and circular economy. Extinction is forever (Dasgupta, 2021).

The dramatically different structure of the First Nations system provides powerful insights into the impact of shifting system paradigms to those based in

nature. This is reflected visually through the fractal structure of the system. Fractals are self-replicating geometric patterns found in nature that appear at different scales and create complexity from simple patterns. This visual resemblance is striking. This resemblance shows how a deeply ecocentric system that values balance and has sustained life for over 65,000 years may naturally reflect nature's own logic. Nature-based ways of doing and being clearly offer critical insights for designing sustainable systems.

Critically, education also reflects these paradigms. First Nations education and learning emphasise relational responsibility, systems thinking, interconnectedness, a felt sense of knowing and collective-wellbeing and more. business as usual and circular economy, on the other hand, prioritise outcomes — such as new innovations — over processes. Revaluing the First Nations learning approaches offers critical opportunities to reimagine an education that can sustain both people and the planet.

These findings support the idea that addressing sustainability requires not just new technologies or policies, but a paradigm shift. Without this deeper change, systemic transformation is unlikely. If we want a different outcome, we need a different system. That starts with how we see and relate to the world around us.

Conclusion

Despite the circular economy's promise of sustainability, its structure and outcomes largely mirror those of business as usual. Adjusting rules and parameters alone without addressing the system's underlying paradigm is therefore unlikely to drive meaningful transformation. In contrast, the First Nations system is grounded in a fundamentally different human-nature paradigm and produces distinct structures and outcomes. Rather than seeking growth, it optimises for relational balance, achieving human wellbeing through ecological wellbeing. When environmental limits are embedded in ways of knowing, doing and being, systems can become self-regulating and resilient by design.

Worldview shifts such as this have important implications for education, which is not analysed through systems modelling here but considered conceptually. Dominant education approaches continue to reflect paradigms that drive environmental degradation, including human-nature separation, the treatment of nature as a resource, and anthropocentric assumptions about human innovation being able to transcend environmental limits. Rather than inventing new approaches and perpetuating this logic, sustainability education may need to revalue ways of knowing, doing and being

that honour complexity, connection and custodianship that have sustained life for over 65,000 years.

This should not be about extracting knowledge from First Nations knowledge systems, but about remembering, reconnecting and revaluing. Recentring First Nations voices in sustainability is long overdue and essential to a sustainable future. If true systems change requires paradigm change, then this shift must also change how we feel, learn and live, as people within, not outside or above, a living, interconnected world.

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Human revolution as transformative learning: educational practices within the Soka Gakkai Movement

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Abstract

This paper explores grassroots educational practices inspired by the Soka Gakkai's concept of "human revolution," and their alignment with the call for transformative learning outlined in *No Limits to Learning* (Botkin et al., 1979). Through the framework of "Learn–Reflect–Empower," Soka Gakkai members in Japan and India have developed community-based educational activities that embody the values of participatory, integrative and anticipatory learning. Three case studies are examined: (1) the awareness-raising campaign on the Sustainable Development Goals (SDGs) conducted by Bharat Soka Gakkai (India), which empowers youth to take concrete steps towards achieving the SDGs; (2) the Tohoku Future Research initiative in Japan, in which youth engage local communities through surveys and dialogue to address an aging society and revitalise their cultural identity; and (3) the lived practices of community engagement undertaken by Soka Gakkai members serving as leaders in neighbourhood associations and public housing complexes, which serve as informal sites of lifelong learning.

These examples demonstrate how inner transformation can generate sustainable social impact at the local level. They also offer insight into how spiritually based empowerment and community learning can help address the "human gap" and build capacity for hope and resilience amid global uncertainty. This paper argues that these practices are not only compatible with global educational discourses but also provide unique contributions to the evolving understanding of transformative learning for better futures.

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Keywords: human revolution, Learn–Reflect–Empower, education for sustainable development, aging society, community leadership

Introduction

In a world increasingly characterised by fragmentation, polarisation and ecological breakdown, the concept of hope is often dismissed as naive or sentimental. All too often, the more people learn about the complex issues affecting humanity, the more powerless they feel. Yet, in *No Limits to Learning*, co-authors James W. Botkin et al. (1979) argue that cultivating new ways of learning is central to addressing what they call the "human gap" — the growing disconnect between technological advancement and ethical, emotional and societal development. Their warning remains as powerful as ever after 45 years and continues to resonate strongly with us today. This paper examines the educational practices of the Soka Gakkai, a global Buddhist movement, as one contribution to lessening the human gap through transformative learning and human revolution.

In keeping with the core message of *No Limits to Learning* (Botkin et al., 1979) — that it is not information we lack, but the ability to turn information into understanding and action that is missing — the heart of Soka Gakkai's approach lies in the concept of human revolution: the idea that the inner transformation of the individual becomes the starting point for social engagement and value creation. The Japanese word *Soka* itself means "value creation." In *Before It Is Too Late*, his dialogue with Aurelio Peccei, first president and co-founder of the Club of Rome, Daisaku Ikeda, the third president of Soka Gakkai, briefly explains the necessity of human revolution as follows: "Man's most pressing task today is the elevation and reformation of his inner spiritual life. This is what I call the human revolution" (Peccei & Ikeda, 2009, p. 21). Far from being a solely personal or spiritual endeavour, human revolution is inherently educational and social. The unleashing of inner human potential naturally inspires hope and action.

Ikeda (2002) expanded this concept in his proposal for a UN Decade of Education for Sustainable Development and applied it in proposing a learning model of "Learn–Reflect–Empower," whereby learning leads to reflection and empowerment. In it, he wrote: "Nothing is more crucially important today than the kind of humanistic education that enables people to sense the reality of interconnectedness, to appreciate the infinite potential in each person's life, and to cultivate that dormant human potential to the fullest." Soka Gakkai has employed this model to provide supplementary educational opportunities in school settings and as a grassroots, community-based activity.

This paper presents three cases of such practices: (1) the awareness-raising campaign on the SDGs organised by Bharat Soka Gakkai (BSG), the Soka Gakkai organisation in India; (2) a locally rooted learning initiative by youth in Tohoku, Japan; and (3) everyday efforts by Soka Gakkai members who live in public housing complexes in Japan to contribute to their local communities based on human revolution. These initiatives show how grassroots, "value-creating" education can become a force for regeneration, solidarity and hope. Aligned with the principles outlined in *No Limits to Learning* (Botkin et al., 1979), these practices offer a compelling model for education that is participatory, integrative and oriented towards global responsibility.

Theoretical foundation: human revolution and learning for transformation

The concept of human revolution (*ningen kakumei*) as articulated by Ikeda (1991–2011) represents a process of profound inner transformation that begins with the individual but extends outward to shape society. This transformation is not limited to personal development or spiritual attainment; rather, it is an educational act — one that challenges people to awaken to their own agency, dignity and interconnectedness with others and the environment (Fuchs, 2024; Goulah, 2021). In this sense, human revolution is inseparable from learning: it is an act of learning that alters the way one sees oneself, others and one's role in society. Fuchs (2024) further argues that Soka Gakkai communities serve as learning communities in which members strive for and encourage one another to achieve their own respective human revolution.

Human revolution begins with deep introspection and a commitment to change from within, but it is always linked to concrete action. It is a refusal to be resigned to structural injustice or inherited limitations, a belief that positive change is always possible and a determination to create value in any circumstance (Inukai & Okamura, 2021). This perspective sees education not merely as the transmission of knowledge but as a practice of liberation and empowerment — an ongoing process of becoming fully human in relationship to others (Goulah, 2021). In this way, human revolution functions as a transformative learning paradigm rooted in hope. It asserts that individuals, no matter their circumstances, have the capacity to transform suffering into strength and isolation into solidarity. As such, it offers a powerful educational response to the human gap identified in *No Limits to Learning* — by placing human dignity and relational transformation at the centre of the learning process.

In October 2024, multiple organisations, including the Club of Rome and Soka

Gakkai, co-hosted a conference titled "It's Time for a Human Revolution" at Taplow Court, Berkshire, United Kingdom, exploring the mechanisms by which inner transformation sparks social change. The conference highlighted, through the delegates' own experiences of struggling in often challenging situations, how a single individual's inner transformation — their human revolution — can even influence entrenched beliefs in particular areas of society and bring about institutional transformations. In addition to presentations on topics such as the relationship between humans and nature and inner transformation, the majority of the conference was dedicated to fostering dialogue among intergenerational participants with diverse backgrounds. A supplement to The Japan Times published a report on the conference, which observed that a human revolution was emerging—one that begins with each individual but inevitably expands to encompass others and the community of life. When Louis Klein moderated the main panel discussion, he described human revolution as "a process of becoming more human." This conference showed that human revolution is not mere internal reflection on knowledge or a simple change of perspective. It is a process that actively encourages thinking through dialogue with others and exploring what can be done in reality to solve problems.

Learn–Reflect–Empower: a model for value-creating education

The idea of human revolution has been further developed and elevated into an educational model for sustainable development. Outlined in Ikeda's proposals to major sustainability-related UN conferences (2002, 2012), it is expressed in the cycle of "Learn–Reflect–Empower." This formula is laid out in the following terms: learning involves more than the passive reception of information; it includes questioning assumptions, engaging emotionally and ethically and identifying with the struggles of others. Reflection enables individuals to internalise knowledge in light of their own lived experiences. Empowerment, then, is not granted from outside but arises from the realisation of one's inherent potential and the will to act for the greater good.

The learning phase extends beyond acquiring information about the natural environment, local customs, or community history. It invites learners to see their surroundings not as inert facts but as living relationships. Learning in this sense includes empathetically understanding the realities of those who suffer, feeling their pain as our own and becoming conscious of our interconnectedness. In the reflection phase, individuals critically examine their experiences, values and assumptions. This is not limited to intellectual reflection but includes ethical and emotional engagement — questioning not only what we know but how we live. This phase also enables

learners to see their lives in relation to the needs of future generations.

The final phase, empowerment, is realised when individuals come to see themselves as protagonists within their communities — people who can initiate change and encourage others. This is not empowerment as an external gift but as a deep awakening to one's inherent potential to act, connect and lead.

Ultimately, this cycle fosters a shift from personal insight to social commitment. It reflects a form of community-based education that does not end with awareness but moves towards leadership, care and responsible action — an embodiment of human revolution in daily life. In this way, Learn–Reflect–Empower offers a living educational framework that responds to the pressing need for participatory, ethical and future-oriented learning in the 21st century. The following presents examples of this process in action in India and Japan.

Case studies of practice-based learning rooted in human revolution

BSG for SDG campaign in India

Bharat Soka Gakkai (BSG), the Soka Gakkai organisation in India, has launched a nationwide initiative titled "BSG for SDG" under the banner "Towards 2030: Achieving SDGs through Sustainable Human Behaviour." This campaign, introduced in 2021, reflects a deep commitment to advancing the Sustainable Development Goals (SDGs) by fostering behavioural transformation at the individual and community levels. It seeks to inspire youth to overcome feelings of powerlessness and to act as protagonists in the creation of a sustainable and just society.

At the heart of the campaign is the "Seeds of Hope & Action (SOHA)" exhibition, which was originally co-produced by Soka Gakkai International and Earth Charter International in 2021 and has been shown in more than 20 countries and territories as of 2025. This exhibition consists of 25 panels emphasising the power of individual action and the importance of human revolution as the basis for global change. Its overall flow is based on the Learn–Reflect–Empower framework. By presenting stories of individuals who have responded creatively and courageously to social and environmental challenges, the exhibition fosters a sense of agency and hope among young participants. At the second-to-last panel, viewers are encouraged to think of their own actions for the SDGs and to attach a sticky note to the panel or use a QR code to express what they hope to do.

BSG is one of the national Soka Gakkai organisations that has strongly promoted this exhibition. As of June 2025, the exhibition has been hosted in over 210 schools and colleges in India and has reached more than 100,000 students and educators (Bharat Soka Gakkai, n.d.). Prior to the exhibition showing, a training session is often organised by BSG for school students, in which the various aspects of the exhibition are introduced. The students learn and, in turn, play a guiding role by explaining each panel to viewers. They also showcase initiatives they have undertaken towards sustainability.

This occasionally results in the establishment of SDG Clubs in various educational institutions. These clubs offer students a platform to meet regularly, discuss local and global sustainability issues and develop and share ideas for action. In a BSG YouTube interview (Bharat Soka Gakkai, 2023), Harsh Bhanudas Bhapkar, a student at D. Y. Patil University in Mumbai, shared how organising the SOHA exhibition and serving as an SDG Club ambassador sparked his passion for sustainability. Believing that change starts with one person, he committed to daily actions and to inspiring others — efforts that, when multiplied, contribute to broader community impact.

An example of such collective spirit can be seen in the initiative of St Joseph's College, School Department, North Point, Darjeeling, which launched an SDG Club to promote awareness and action among its students. In 2025, the school held its third annual SDG Conclave titled "Planet Calling," an event that has become a cornerstone of its sustainability education efforts. The conclave featured a range of performances, poster-making and presentations and interactive learning activities, contributing to a successful programme that actively engaged both students and educators, including participants from neighbouring schools and local NGOs.

In addition, BSG's original mobile app, "SDG × BSG," is helping to promote the movement. Rooted in the belief that sustainable behaviour begins with individuals, the app enables users to document and share their eco-friendly actions — such as composting or using public transport — thereby creating a visible community of grassroots environmental leadership. With features such as a carbon footprint calculator and practical resources, it bridges awareness and action, empowering people to take meaningful steps. Nangia (2025) reports that the app has been downloaded by over 15,000 users across India and beyond. BSG supports these efforts by curating educational materials on the SDGs and encouraging a learning model grounded in the Learn–Reflect–Empower cycle. More than 30,000 pledges of individual action have been uploaded by users.

Notably, individual members are taking innovative actions rooted in sustainable human behaviour (Gupta, 2022). For instance, one young member initiated a composting system in their community using household organic waste to promote a circular local economy, while another organised biodiversity documentation and birdwatching sessions to raise awareness of ecological preservation in urban spaces. These stories reflect a bottom-up approach to sustainability that empowers individuals to take ownership of global challenges within their immediate environments.

In line with *No Limits to Learning* (Botkin et al., 1979), BSG's campaign exemplifies participatory, anticipatory and innovative education that transcends the mere transmission of knowledge. It nurtures the determination to treasure community and environment, inspires dialogue-based reflection and encourages proactive steps towards a shared future. This ongoing initiative not only fosters ecological awareness but also cultivates leadership and solidarity among youth, laying the foundation for a new culture of sustainability driven by humanistic values.

Tohoku Future Research initiative by youth in Japan

Japan's rural and mountainous regions have long faced pressing challenges such as population decline, depopulation and the erosion of local social infrastructure. In many areas, traditional community events are disappearing due to a lack of younger successors, and civic organisations such as neighbourhood associations and volunteer fire corps, which have long been key components of civil society across Japan, are struggling to sustain themselves.

These symptoms are most obvious in the Tohoku region, the north-eastern part of Japan's main island, consisting of six prefectures. Traditionally, this region has been known particularly for agriculture, forestry and fisheries. Over the past couple of decades, these industries have deteriorated, and aging and population decline have advanced more severely than in other regions of Japan. Each year, the population of the region declines by more than 1%. Two of the fastest-declining prefectures in Japan are located in this region. The average age of the population is over 50 and is projected to continue to rise. This tendency was accelerated by the Great East Japan Earthquake in 2011, which directly struck and devastated the coastal areas of the region.

Local communities in the region sit on the front lines of social transformation, as conventional, unidirectional models of knowledge transmission are no longer adequate. In response, members of Soka Gakkai's youth division in the region reflected on the situation in their communities and decided to initiate an initiative called

Tohoku Future Research in 2024. This grassroots endeavour represents a dynamic and participatory response to emerging local needs, involving deep listening through dialogue and the creation of value based on what is already present.

In this practice, learning begins not with lectures or manuals but with questions posed by the community itself: What is being lost? What do we care about? How do we live well here, together? Youth members form a steering committee within the community and then conduct an awareness survey that includes individual interviews with residents, asking about local culture and traditions, the most attractive places, reasons for living in the area, future challenges and what they hope to pass on to future generations. Individual interviews provide opportunities for respondents to elaborate on their daily challenges and concerns, leading to further mutual learning. Interviewees typically account for around 5 to 10% of local residents, covering all generations. In some cases, senior respondents find that the interview itself sparks memories and a renewed sense of love for, and pride in, their community.

The results are often shared in public discussion meetings held with the support of local municipal governments. Typically the meetings are attended by around 100 participants and include local traditional performances and music, which are presented as symbols of local culture and serve as catalysts for community empowerment. One such event, held in the town of Yahaba in Iwate Prefecture, included a traditional local dance that had not been performed for several decades. The Soka Gakkai youth division in Tohoku plans to implement this process in all 227 cities, towns and villages in the region over the coming decade. As of May 2025, the initiative has been completed in nine towns.

One participant remarked, "I realised I had already given up on this place without even knowing it." Others described how the process of listening and learning rekindled their affection for their hometowns, fostered mutual respect and shifted their self-perception from passive observers to active caretakers of place.

Oriented towards building resilience in the face of demographic and social change, the initiative involves residents not merely as recipients of assistance but as co-producers of knowledge. Moreover, the process fosters deep reflection, prompting participants to re-examine their assumptions and commitments, and ultimately empowering them to take action in their communities in accordance with the Learn–Reflect–Empower model. What emerges is not only a model for regional revitalisation but also a vivid example of learning as human revolution — a transformative cycle of awareness, care and responsibility developing from the ground up.

Grassroots community contributions

In Japan, local neighbourhood associations — known in large-scale public housing complexes (*danchi*) as "housing complex self-governing associations" — have played a key role in local governance for over a century. Historically, the government encouraged the creation of such associations to supplement the functions of local municipal offices (Tamano, 2024). These associations are organised within regular housing areas of between 30 and 100 households, as well as within public housing complexes. Networks linking multiple associations have also been formed. Their functions include setting rules for waste disposal, developing disaster evacuation plans and organising events that promote interaction among residents. The associations operate on a voluntary basis, sometimes with a small honorarium for leaders, who today are often older adults.

Previous studies (Tamano, 2011; Koike, 2021) have reported that many Soka Gakkai members serve as board members and volunteer leaders in these community-based organisations. For example, a study of a housing complex in Fukuoka Prefecture found that one in four neighbourhood association leaders was a Soka Gakkai member (Koike, 2021). This engagement reflects a core tenet of Soka Gakkai's values grounded in the concept of human revolution: contributing to the betterment of one's community is viewed as an expression of faith. Human revolution entails moving from a narrow focus on one's own circumstances towards the cultivation of compassion and a natural desire to contribute to the wider community. This perspective positions Soka Gakkai not merely as a religious organisation but as a lifelong learning institution — a community in which individuals cultivate civic responsibility, leadership skills and deep ethical engagement throughout their lives.

Members share and learn from one another's challenges and experiences through monthly Soka Gakkai discussion meetings. For members living in public housing complexes, where large numbers of households coexist in sometimes crowded conditions, ten guiding mottos were introduced in 1995 to encourage positive social relationships. These mottos emphasised building friendships with other residents and participating proactively in community activities. Discussion meetings provide a space to reaffirm this spirit and renew participants' determination to strive for human revolution.

Akiko Oka, a woman in her 70s living in the Tokyo Metropolitan Government's Toyama Heights public housing complex observed challenges arising from the growing number of Asian residents who were not yet fully integrated into the community. Tensions emerged around issues such as waste disposal and noise. Guided by her belief in the power of dialogue, Akiko engaged both groups — explaining local rules

to foreign residents while encouraging Japanese neighbours to better understand other cultures. Over time, this approach fostered mutual exchange, and foreign residents began participating in the complex's twice-yearly clean-up events.

In Ehime Prefecture, Chihoko Tanimoto moved to a newly developed area without a neighbourhood association. Faced with local issues, she initiated discussions with neighbours, which led to the formation of an association in 2012, with Tanimoto serving as its first leader. When flooding struck the area in 2018, the association proved essential, as municipal authorities prioritised requests from organised groups over those from individuals.

Thus, both ideologically and in practice, Soka Gakkai contributes to the sustainability of local communities by bridging religious conviction with civic participation. In this sense, it functions as a decentralised, non-formal educational network that promotes lifelong learning through everyday acts of public service and community leadership. Its encouragement of participation in neighbourhood associations — particularly in public housing complexes — offers a compelling model of how learning-oriented organisations can act as agents of community resilience in an aging and increasingly fragmented society.

Conclusion: Reimagining education through human revolution

The learning practices examined in this paper — rooted in the Learn–Reflect–Empower framework and the ethos of human revolution — exemplify the kind of educational paradigm urgently needed to enable societies and local communities to adapt to the multiple changes of our time.

Across all three initiatives, learners are not passive recipients of information. They engage directly with the challenges and potential of their local communities — whether through interactive exhibitions, inquiry into depopulated regions, or everyday acts of compassion and support. This active engagement fosters agency and co-creation.

The learning process is neither reactive nor backward-looking; it is oriented towards imagining and building alternative futures. Whether addressing the SDGs, regional futures or neighbourhood revitalisation, these practices encourage learners to consider the kind of society they wish to co-create for themselves and for future generations.

By placing hope at the centre of the learning process, these practices reframe

education not merely as a response to problems but as a means of creating new possibilities. They cultivate the capacity to live with uncertainty while taking action grounded in dignity, compassion and solidarity. In doing so, Soka Gakkai's educational efforts directly confront the human gap by fostering qualities of consciousness, care and creativity that technological progress alone cannot supply.

Central to this vision is the idea that every person has the potential to become a protagonist of change. Education, viewed in this light, is not simply preparation for life but life itself — lived with full awareness of one's capacity to create value amid challenge. Human revolution, therefore, is not an abstract ideal but a lived reality, expressing education in its broadest sense: what emerges when individuals recognise their agency, reflect deeply on their circumstances and empower themselves and others to act for the greater good.

Daisaku Ikeda's (2013) commentary in *The New Human Revolution*, a novelised history of Soka Gakkai, captures this moment: "Individuals, society and the world were seeking human revolution — the process of becoming a person who is strong at heart and takes on life's hardships in a positive way … Young people in particular were focused on transforming themselves and their ways of living. He sensed the approach of an era of human revolution" (p. 182).

As calls grow louder for new paradigms to address the planetary emergencies we face, the contribution of the international Soka Gakkai network — rooted in Ikeda's writings and anchored in human dignity, hope and responsibility — offers a model of lifelong learning that refuses to give up on people, communities or the future.

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Chapter 2

Moving the Lines in Educational Institutions

Education is being asked to do something it has rarely been asked to do at this speed or this scale: change faster than the crises it is meant to help societies navigate. The convergence of climate breakdown, AI-driven labour disruption, geopolitical fragmentation and a documented mental health crisis among young people is not a distant scenario to plan for; it is the operating environment educators face today. A 2021 global survey published in *The Lancet Planetary Health* found that the majority of young people across 10 countries reported feeling afraid, sad or powerless about climate change, and nearly half said this distress affected their daily functioning (Hickman et al., 2021). The World Economic Forum's most recent *Future of Jobs* analysis projects that 39% of workers' core skills will change by 2030, with employers ranking analytical thinking, resilience, flexibility and agility, and leadership and social influence among the most essential capabilities, ahead of most specific technical competencies (World Economic Forum, 2025). UNESCO's *Reimagining Our Futures Together* report goes further, arguing that education itself stands at a crossroads and that the social contract underpinning it, built for an earlier, more stable world, requires renewal rather than maintenance (International Commission on the Futures of Education, 2021). Taken together, these are not separate problems requiring separate responses. They describe a single condition: the systems that prepare people to understand and act in the world are now structurally out of step with the speed and complexity of the world they are preparing young people for.

While not a new observation, the urgency of this reality has changed in character. As early as 1979, the report to the Club of Rome - *No Limits to Learning* diagnosed what its authors called the "human gap," the widening distance between humanity's accelerating capacity to act upon the world and its comparatively stagnant capacity to understand, anticipate and govern the consequences of those actions (Botkin at al., 1979). The report's central claim was that most formal education functions as "maintenance learning": the transmission of previously validated knowledge, skills and norms to the next generation. Maintenance learning is necessary, societies could not function without it, but it is oriented backward, towards consolidating what is already known, rather than forward, towards what will be needed. Botkin and his co-authors called instead for learning that is anticipatory (oriented towards future scenarios, not only past facts), participatory (built through dialogue and shared agency rather than transmission), integrative (working across disciplinary and cultural boundaries rather than within them) and innovative in the literal sense of generating genuinely new responses rather than recombining old ones. Paulo Freire had made a structurally similar argument a decade earlier in *Pedagogy of the Oppressed*, describing conventional schooling as a "banking model" in which knowledge is deposited into passive students and arguing that liberatory

education must instead be dialogical, problem-posing, and rooted in learners' own lived reality (Freire, 1970). Jack Mezirow's later theory of transformative learning gave this critique a developmental architecture, describing how genuine learning often requires a "disorienting dilemma" that destabilises a learner's existing frames of reference before new, more inclusive and discriminating ones can be constructed (Mezirow, 1991, 2000).

What is striking is how much of the international policy architecture has already absorbed this diagnosis, at least rhetorically. UNESCO's *Learning: The Treasure Within* set out four pillars of education—learning to know, to do, to live together and to be—to explicitly counter narrowly instrumental, knowledge-transmission models of schooling (Delors, 1996). The OECD's *Learning Compass 2030* frames education around student agency, co-agency and the cultivation of transformative competencies for creating new value, reconciling tensions and taking responsibility (OECD, 2019). The European Commission's GreenComp framework formalises sustainability as a competence to be built across all levels of education, not appended as elective content (Bianchi et al., 2022). Sustainable Development Goal 4, Target 4.7, commits signatory states to ensuring all learners acquire the knowledge and skills to promote sustainable development and global citizenship (United Nations, 2015). On paper, the case for moving away from maintenance learning has been made repeatedly by some of the most influential bodies in global education policy, for nearly three decades.

And yet implementation has left a lot to be desired. Michael Fullan's research on educational change describes a persistent gap between policy adoption and what he calls "the meaning of change" at the level of actual classroom and institutional practice. The gap between policy intention and lived classroom reality has proven stubbornly wide: reform is mandated and measured without necessarily being meaningfully enacted (Fullan, 2007). Gert Biesta has argued that this gap is partly self-inflicted, tracing it to what he calls the "learnification" of education: the way an era of intensified measurement and accountability has allowed the language of learning outcomes to crowd out the deeper questions of educational purpose that matter most, among them qualification; socialisation; and subjectification, the formation of a person capable of independent thought and action (Biesta, 2010). Stephen Sterling, writing specifically on sustainability in higher education, has made a parallel argument: most institutional responses to sustainability remain additions to an otherwise unchanged curriculum, when what is required is a whole-institution reorientation of purpose, pedagogy and governance (Sterling, 2001). The result, across several decades and several reform cycles, is an unusually wide and well-documented

chasm between what education theory and policy recommend and what actually happens inside classrooms, faculties and institutions.

It is this chasm, and the urgency of closing it now, that gives this chapter its title. The Club of Rome's recent The Fifth Element programme has reframed the human gap for the present moment, arguing that the deficit is no longer primarily one of insight: countless initiatives worldwide already embody anticipatory, participatory and integrative learning, but they remain insufficiently connected to one another to shift the dominant patterns of business as usual (Álvarez Pereira et al., 2025). Donella Meadows had earlier identified the capacity to question and transcend a paradigm as among the highest leverage points available for changing any complex system, higher than changing rules, structures or even goals (Meadows, 1999). To "move the lines" is to do something more demanding than adjusting a policy lever. It is to deliberately redraw the boundaries governing whose knowledge counts; which languages are legitimate; and whether hope, emotion and uncertainty have any educational standing at all.

The window for gradual change has closed. The children sitting in classrooms today will come of age in a world already shaped by the consequences of decisions being made now, and no policy framework, however well designed, will substitute for the quality of the education they receive. Something more than incremental adjustment is called for. And it is already happening.

It is against this backdrop that the case studies gathered in this chapter should be read: as field evidence that the lines described above are, in specific and well-documented instances, already being moved. Their value lies precisely in being empirically grounded: each case study documents what an institution did, with whom and what changed, in contrast to the considerable body of policy literature that specifies what institutions *should* do. Read together, they also offer something the policy literature on its own cannot: a sense that transformation looks different depending on where it happens, while still sharing a common underlying logic. These case studies are not diverse illustrations of one universal model. They emerge from distinct contexts, knowledge traditions and relationships with the land and communities they serve, and that plurality is itself part of the argument this volume makes. A pluriversal world, as the Club of Rome has proposed, is not one in which a single recipe for change is scaled up and exported, but one in which many different pathways towards wellbeing are recognised, respected and allowed to nourish one another. They are distinct, situated responses to a shared structural problem, and that plurality is itself part of the argument this volume makes.

Two of the case studies work at the earliest stages of formation, where the human gap, left unaddressed, calcifies fastest. Spiteri's research with children under eight in Malta documents a rising prevalence of climate anxiety driven by fragmented, fear-based exposure to environmental crisis and argues for embedding climate literacy into national curricula through storytelling and nature-based, solution-oriented methods. Pellizzato and Nicomedi's account of the *Cambio io, cambia il mondo* programme in Italian public schools shows mutual learning operating in practice: circles of observation, dialogue and participatory problem-solving around local sustainability issues, grounded in Daisaku Ikeda's philosophy of value-creating (*Soka*) education and in Aurelio Peccei and Ikeda's (1984) earlier call for an inner "human revolution" as the precondition for outer, societal change. Both chapters insist that the capacities Botkin and his colleagues called anticipatory and participatory learning are not adult competencies retrofitted downward but capacities that must be cultivated from early childhood if they are to be available later.

A second cluster moves into higher education, where institutional inertia is typically strongest and where the line-moving documented here is correspondingly more structural. Mhlongo, Sindane, Manono and Nzala describe a project in the Faculty of Engineering & the Built Environment at the University of Cape Town that combines an early risk-assessment framework, peer mentorship and a multilingual digital glossary in isiXhosa, Sesotho, Kiswahili, Afrikaans and accessible English with an AI-enabled support hub. The project directly confronts the academic exclusion and language marginalisation that conventional, monolingual "maintenance" curricula reproduce and offers a replicable model for doing so at scale. Berstrand, Hoskyns, Raonic and Westermann of the Crosscultural Research in Architecture Collective document three interventions across China and Norway that replace architecture's conventional emphasis on static form and technical fixes with process-oriented, relational practice. Drawing on Eastern relational thinking and the radical pedagogies of Freire and Boal, their work repositions architectural education as a site of collaborative sense-making and hopeful engagement with uncertainty. Mykrä, Puurtinen and Lehtonen turn the lens onto curriculum design itself, showing how cross-faculty collaboration at the University of Jyväskylä not only built a new sustainability transition module but became a transformative institutional act in its own right. Mejía-Cáceres extends this into explicitly decolonial territory, using project-based learning in a multicultural master's-level course to show how sustainability education can move from symbolic inclusion towards what she calls epistemic centrality, the point at which historically marginalised knowledges become genuinely constitutive of the learning itself.

A third cluster foregrounds the affective dimension of the human gap that policy frameworks routinely underplay. Barnes, Williams, Peklanska and Portus examine the Hopeful Futures Programme, in which students use hope theory to engage in chosen environmental topics. They find that the initial discomfort many students feel when asked to practise hope, becomes, when supported by reflective and relational pedagogy, a catalyst for lasting personal and professional change. This finding gives empirical weight to a claim that is often asserted but rarely tested: that hope, properly taught, is an active competency rather than a passive disposition. Emovwodo and Ayo-Obiremi examine how Bowen University in Nigeria uses structured, student-led leadership roles to build the ethical decision-making and systems thinking that hope-driven responses to global challenges require, positioning the university itself as a laboratory of hope in the fullest sense of that term. Bouraoui's account of the Nairobi Summer School on Climate Justice and its deliberate, context-sensitive adaptation in Tunisia through the association APEDDUB, closes this cluster by extending the frame beyond formal schooling altogether. It investigates the informal civil-society spaces where a great deal of environmental learning occurs and where institutional permission is least available and most improvised.

What unites these distinct interventions, spanning early childhood classrooms, engineering faculties, architecture studios, sustainability modules, leadership programmes and summer schools across more than a dozen countries, is a shared structural move: each, in its own institutional register, substitutes some element of anticipatory, participatory, integrative or innovative learning for an element of maintenance learning that previously stood in its place. What they offer instead is something arguably more useful at this moment: proof, documented and analysable, that the boundaries education theorists and global policy frameworks have been recommending institutions redraw for nearly 50 years can in fact be redrawn by ordinary institutions, working with the constraints of their own context, without waiting for a perfect policy environment to make the work easier. In addition to being inspirational stories, these case studies deserve close attention as a working, comparative record of how the lines actually get moved and what it costs and yields when they do. For what they ultimately demonstrate is something education has always promised and too rarely delivered: that hope, when it is institutionally held and pedagogically practised, is not a sentiment but a force.

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Think globally, change inwardly, act locally: mutual learning as a driver of transformative sustainability education

Giulia Pellizzato and Iris Nicomedi*

Abstract

This qualitative case study is based on a pilot programme implemented in public schools in Italy. It explores participants' experiences and views, with particular attention to the influence of observation, collaborative learning and dialogue centred on local issues that appear to influence the participants' relationship with their environment in positive ways.

Inspired by Daisaku Ikeda and Aurelio Peccei's (1984) call for a human revolution and couched in Daisaku Ikeda's philosophy of human education (2021a), the pilot programme organised participants in multiple circles of mutual learning driven by participatory problem solving. Individuals honed their capacity for anticipation and participation (Botkin et al., 1979) and collaborated to devise solutions to sustainability-related issues in their schools and communities. This critical instrumental case study examines key concepts from Ikeda's philosophy of education through the participants' experiences and views, affirming the relevance of value-creating education for educational praxes and policies.

Participants' feedback evidences the transformative potential of value-creating approaches to sustainability education, mobilising participants' capacity to bridge the existing gap between humans and their environment through collaborative learning and participatory problem solving. The programme was implemented by

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the project I Change, the World Changes [Cambio io, cambia il mondo]. Rooted in the ethos of "Think globally, change inwardly, act locally," the project is promoted and coordinated by the Be the Hope Foundation.

Keywords: mutual learning, value-creating education, Daisaku Ikeda, Aurelio Peccei, human revolution, empowerment.

Introduction

Education for sustainable development, often referred to as ESD, is a priority in European policies. Alongside an official recommendation (Council of the European Union, 2022), the Joint Research Centre of the European Union produced a competence framework for guiding education efforts: GreenComp, the Competence Framework for Sustainability (European Commission, 2022). Despite efforts by institutions and citizens, however, the latest report by the Eurydice Network revealed ongoing challenges (European Commission et al., 2024). According to the report, teacher education does not feature ESD in most European countries, and GreenComp's competencies lack a dedicated space in school curricula. Furthermore, less than a third of European school systems fund ESD or monitor how it is infused in formal education. Lastly, among GreenComp competencies, "futures literacy" is the least represented (European Commission, 2024, pp. 11–12). GreenComp defines futures literacy as the ability to "envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future" (European Commission, 2022, p. 15). According to the 2024 Eurydice Network report, therefore, formal education in Europe still struggles to bridge the gaps identified by the 1979 Report to the Club of titled *No Limits to Learning*. In it, Botkin et al. (1979) asserted the need for innovative learning, which they characterised as anticipatory and participatory.

Today, almost half a century later, the "*problématique*" of interlocking economic, environmental, political and social problems outlined by works associated with the Club of Rome (Ikeda & Peccei, 1984; Meadows et al., 1972) is still there (Albert, 2024; Parnell et al., 2024). In the Italian context, studies show that the gap between humans and their environment runs deep: young people engage in sustainable behaviours less than the European mean in several areas (Palmerio & Greco, 2024; Pettenati, 2024). Examples of transdisciplinary ESD projects and activities at the secondary level are needed, as available materials mainly concern specific disciplines, such as biology and science (Ilardo & Salinaro, 2023). Aiming to respond to the needs of students and teachers in Italian secondary schools, the project I Change, the World Changes

[Cambio io, cambia il mondo] developed and implemented a pilot educational programme, which completed its first iteration in May 2025. It is based on cooperative learning and participatory problem-solving practices inspired by Daisaku Ikeda's proposals and views on education (Ikeda, 2002, 2012, 2014, 2021a; Goulah, 2020b, 2021a, 2024; Nuñez & Goulah, 2021; Pellizzato, 2024), which are consonant with core principles of the No Limits to Hope initiative.

I Change, the World Changes was promoted by Soka Gakkai Italy, a community-based Buddhist organisation advancing peace, culture and education based on respect for the dignity of life. It is one of many initiatives developed within the Soka Gakkai's transnational movement for peace, culture and education (see Akasu et al. included in this volume; Goulah, 2020a; Ikeda & Goossens-Ishii, 2024). Today, the project is run by the Be the Hope Foundation, based in Rome.

Research questions

This qualitative case study explores the effects of the educational programme implemented by I Change, the World Changes in Italian public secondary schools, examining participants' experiences and views from the vantage point of their relationships with their environment. While raising awareness of human interdependence with all life is a key component of ESD, the Club of Rome's and Ikeda's visions go further, framing interdependence not merely as an educational outcome, but as a core goal of education itself. By analysing participants' feedback, the case study seeks to offer actionable stimuli for current and future educational praxes. Specifically, it explores how participatory, place-based practices of mutual learning and problem-solving influence participants' experiences and views in terms of their relationship with the surrounding environment. Research questions are, therefore:

— Does a transdisciplinary collaborative engagement centred on practical local issues influence participants' relationships with their immediate environment? Does it begin to repair what is often referred to as the broken relationship between humans and nature?

— Does participatory problem-solving foster individuals' sense of agency, responsibility and purpose with respect to advancing sustainability in their local context, bridging the gap between knowledge and action? If so, how?

— Did this pilot programme foster human revolution and mutual learning across chasms among participants in ways that can be replicated in other formal as well as informal and non-formal educational programmes?

The following section introduces the theoretical underpinnings of the programme and the case study, focusing on the "human gap" (Botkin et al., 1979) and education as mutual learning (Ikeda, 2021a). The Methodology section describes the research setting, the programme, data collection and analysis. Findings are then presented in terms of emergent themes and patterns—and specifically the ability of the programme to increase students' interest in sustainability—the pedagogical relevance of participatory processes, and the challenge of learning and doing together as the most rewarding experience for participants. The discussion section interprets findings according to research questions. Finally, the Conclusion section summarises findings and puts forward suggestions for ESD in Europe and beyond.

Theoretical framework

Limits and challenges to innovative learning identified in Botkin et al. (1979) almost half a century ago are still cruxes of education today. In Western formal education, human interdependency with the natural environment is systematically erased in all facets of the curriculum (He et al., 2015). In this sense, despite growing engagement and a burgeoning body of literature (Lupinacci & Happel-Parkins, 2016; Gkiolmas & Skordoulis 2020; Russell, 2021; Sharma, 2020; Snaza, 2019), human interdependence with the natural environment still belongs to the "null curriculum": that which is not taught, which is also a source of learning for students (Eisner, 1979).

In this context, the educational philosophy of Daisaku Ikeda (1928–2023) — Japanese peacebuilder, Buddhist philosopher, author, poet and educator — is particularly relevant. Between the 1970s and the 1980s Ikeda and the Club of Rome's founder Aurelio Peccei met repeatedly, sharing their views on the relationship between humans and their environment, societal interactions and what they called human revolution: inner reformation allowing individuals to unlock their latent potential, leading to societal transformation (Ikeda & Peccei, 1984). Ikeda and Peccei fully agreed on the importance of education towards fostering human revolution.

For Ikeda, sustainability education is one of the four main components of global citizenship education (2021b; see also Lupinacci, 2021; Goulah 2019). Central to Ikeda's philosophy of human education (*ningen kyōiku*) is the emphasis on mutual learning (Nuñez & Goulah, 2021). Education, in his view, is not a one-way transmission of knowledge but a dialogic process in which teacher and student grow together (Goulah, 2020b, 2024). Ikeda expresses this view by using two homophonic character compounds, which are both pronounced *kyōiku*: education (教育) and mutual growth (共育):

"The individual growth of a single person will inspire the growth of others and, further, will encourage the growth of one's community and society — this is precisely the principle of a great human revolution. Therefore, if the teacher grows, children will as a matter of course grow. Moreover, for teachers to grow, they must learn from the students' growth. Education [*kyōiku*; 教育] is *mutual growth* [kyōiku; 共育] born from the teacher and student developing together and fostering one another." (Ikeda, 2021a, p. x)."

This perspective on human education, responding to Peccei's (1977, 1979, 1981) vision, is at the core of the project I Change, the World Changes. While carrying out its pilot programme, project staff and volunteers engaged in cooperative learning processes, deepening their understanding of ESD together. After a cycle of remote synchronous and asynchronous learning, volunteers and staff met to prepare in-class activities prior to every session, sharing what they hoped to convey to teachers and students. In class they led activities together, breaking traditional roles of who was teaching and who was being taught, fostering authentic dialogic encounters and modelling human revolution in the classroom. After each session, they took time to reflect dialogically and critically about how the programme could be improved.

Ikeda's philosophy is also characterised by the concept of creative coexistence (*kyōsei*), an active and volitional way of living relationality based on individuals' creativity and their innate ability to create new meaning (Goulah, 2021b). Alongside value creation, global citizenship and dialogue, creative coexistence is one of the four interlocking commitments and ideals Goulah outlined to characterise Ikeda's philosophy of human education (Goulah, 2021b), articulating parallel arguments to Botkin et al.'s (1979) call for anticipatory and participatory learning. Anticipatory learning could be considered a forerunner of GreenComp's "futures literacy" (European Commission, 2022): it fosters students' ability to consider trends, prepare for possible contingencies, consider long-range future alternatives and, most importantly, "evaluate future consequences and possible injurious side-effects of present decisions"; it recognises the global implications of local, national and regional actions (Botkin et al., 1979, p. 13). Participatory learning, on the other hand, emphasises collective problem-solving, and this shared inquiry leads to more effective outcomes. Ikeda's approach thus offers an urgently needed model for education in the Anthropocene — an era demanding that humans reconceive their place within the interconnected web of life and act accordingly (Chakrabarty, 2009).

Methodology

This critical instrumental case study (Creswell, 1997; Creswell & Poth, 2016) examines a pilot programme implemented in public secondary schools across Italian cities — Rome, Livorno, Cesena, Cervia and Pontassieve. Participants included 30 volunteer educators, 680 students and 25 teachers from 8 junior high and high schools, representing a mix of urban contexts (large, medium and small cities). Student demographics ranged from working-class to middle-class backgrounds, with up to 20% from migratory backgrounds. Class sizes varied between 16 and 32 students; engaged schools were in relatively good condition. Each school enrolled up to four classes, for either one two-hour session or three two-hour sessions. All classes explored the exhibition *The Heritage of Life* [L'eredità della vita], created within the project[1] in an interactive fashion. In schools participating to the extended format, students went on to focus on local sustainability issues related to themes explored in the exhibition (such as energy, cities, production and consumption, green areas, waste, food and more) through preparatory activities. During the second session, students collaboratively analysed a chosen issue, mapping the interdependencies and stakeholders involved. Using a design thinking tool, they then developed concrete intervention proposals. The third session featured group presentations and structured feedback from the class as well as project staff and volunteer educators, followed by the writing of individual critical reflections in response to three guiding questions, which also anchored a concluding discussion.

Materials generated by participants were analysed to explore their experiences and views after participating in the programme. Researchers involved were Giulia Pellizzato, who set up and managed the educational programme, and Iris Nicomedi, the executive director of the project.

Data were collected anonymously, then examined and coded independently by both researchers using a two-stage process. First, critical reflections were analysed relative to content based on the conceptual and theoretical framework of this study (Boyatzis, 1998). Second, the same texts were analysed inductively relative to emergent patterns and themes (Billups, 2021; Hesse-Biber & Leavy, 2011; Leavy, 2014; Saldaña & Omasta, 2018). Results were then developed into a narrative of findings with interpretive commentary, structured by emergent themes and research questions.

For the sake of this article, analysis focuses on critical reflections by students and online surveys by teachers, to ensure triangulation by considering feedback

1 Further information and exhibition available on the website: https://cambioiocambiailmondo.it/eredita-vita/

from different sources (Lincoln & Guba, 1985). Both groups were asked: 1) their three main takeaways of the session or programme, 2) what was most challenging for students to understand or to do, 3) what interested them most. While teachers' modules were relative to each session and were filled in as activities were taking place, students' reflections were written during the third session and referred to all three. Students were given approximately seven minutes for responses on paper, which were then photographed by staff for analysis. The bulk of data analysed for this article, therefore, is relative to the subset of individuals who participated in the three-session programme, representing slightly more than two-thirds of all participants involved.

Findings

This section presents findings based on emergent themes and patterns. Responses were concordant on several matters; among these, three were particularly salient. First, students acquired new knowledge and felt a stronger interest in sustainability: "I appreciated the approach employed in presenting topics that are important but not much felt … and caught my attention"; "I understood that acts which I thought were harmless in fact are not." While responses evidence that, in many cases, students did not have a strong personal connection to environmental issues in the beginning, engaging through observation, reflection and problem-solving at the local level helped them recognise their own role: "I was particularly interested in things concerning our region. I learned many things I didn't know. If all of us did even the bare minimum to protect our planet, everything would be better"; "I was most interested in group works on our school, as it is the place we all share"; "seeking feasible solutions made me feel that I am actually part of that problem and of the people undergoing its effects." Indeed, as "the place where history, nature, and society intersect" (Ikeda 2021a, p. 22; see also Gebert, 2009), the local community is an ideal platform for transdisciplinary learning.

Secondly, many students' responses associate learning with collaborative engagement fostered by the programme's methodology. The value of dialogue, cooperation, listening and learning from peers were always among key takeaways. Students openly stated that being able to articulate their opinion, listen to others and engaging in participatory processes expanded their learning: "information from presentations was very interesting … I understood things I would have not been able to understand alone"; "we learned to think together through working in groups"; "today I understood the usefulness of being together in learning." These observations highlight the importance of shared and mutual learning for delivering impactful ESD, converging with Ikeda's (2021a) view of human education as mutual fostering.

Thirdly, aspects which students experienced as most challenging were also perceived as most empowering. The analytical and collaborative demands of the programme — such as identifying local issues, considering the needs of different stakeholders involved, designing feasible solutions and navigating different viewpoints — stimulated students to inquire further and grapple with complexity. Challenges pushed young participants to recognise their capacity to contribute to real-world issues in a meaningful way, attaining a sense of agency and empowerment: "For me, the most difficult part of our project was working in a group and dealing with differing opinions. [What interested me most] was the group collaboration, because I believe it's the greatest strength."

Overall, findings highlight that participatory ESD rooted in local contexts engages students intellectually, emotionally and socially. Responses state that participants expanded their knowledge and interest in sustainability issues, honed their anticipatory skills and futures literacy and gained a stronger sense of responsibility. The challenges students faced became catalysts for human revolution; dialogic learning processes stimulated their ability to negotiate, increasing their sense of agency. Experiences and views from secondary schools therefore cohere with recent literature calling for participatory practices in education and innovation related to sustainability at several levels (Acosta Moré, et al., 2026; Hassenforder & Ferrand, 2024; Leal Filho et al., 2025).

Discussion

This section interprets findings based on the research questions, exploring how the programme influenced participants' awareness of interconnectedness with the surrounding environment, fostered a sense of purpose and agency through participatory problem-solving and supported mutual learning as a driver of transformative ESD.

1. Participatory engagement at the local level contributes to bridging the human gap

Student responses offered numerous clues on how transdisciplinary collaborative engagement centred on practical local issues affected the participants' relationship to their immediate environment. Responses by younger as well as older students suggest that the programme was somehow the first opportunity to think about climate change and possible solutions to tackle it: "It was hard to come up with ideas about the problem we chose, but it was also interesting, as it was the first time I had questions around it." Others, who were cognizant of climate change, expressed a deepened

understanding of its urgency and proximity:

"I feel different after participating in this programme. It opened my eyes even more to how severe the situation is, and to the fact that environmental issues do not concern only Africa or Asia, they concern us as well. I want to improve what I do and what I want to do."

Working on intervention proposals for their own schools, communities and cities led students to realise that climate change is not an abstract problem but a reality that is already affecting their daily lives. This awareness stimulated participants' futures literacy and contributive attitude. A student wrote: "I was most interested in thinking about actual problems which we often don't detect but actually affect our daily lives." Another stated: "It was difficult to understand that these problems are so close to us." Awakening to the urgency of climate change, several participants expressed the wish to engage in experiential activities with contributive outcomes, which Ikeda suggests should be an ongoing component of education, not an exception as field trips are. In his view, early experiences of living a contributive life become the bedrock for subsequent development: "experiencing the feeling that one's actions are of use to others gives confidence to young people and becomes a firm foundation for spiritual growth" (Ikeda, 2021a, pp. 75–76). In this regard, a teacher expressed high appreciation for the programme, which involved students personally and brought them to the centre of attention, "as protagonists of learning."

Responses also indicate that regular classes in public schools do not afford students many opportunities to connect with each other on a human level: "[I appreciated] working in groups to get to know each other—most of all talking with each other to have more ideas—and maybe next time my friends are not there, my classmates will"; "[my key takeaways are] creating stronger bonds with my classmates while working in groups"; "I learned how important it is to listen to others. I understood that if we all unite as a team, in time we can improve the world." Some teachers observed that students do need to explore relationality and affirmed the programme's relevance for the students' growth.

In response to the first research question, responses evidence that transdisciplinary collaborative engagement centred on practical local issues enabled participants to kindle, mend and strengthen their relationship to their immediate environment. At the same time, they suggest that restoring ecological awareness requires reconstructing human connections as well.

2. Participatory problem-solving fosters a sense of agency and purpose

Responses indicate that engaging with sustainability issues through participatory problem-solving — learning, analysing and proposing solutions — gave participants a sense of empowerment and accomplishment. The programme shifted their emotional response from fear or passivity to responsibility and proactive commitment. A student wrote that they appreciated being able to "solve a great fear," while another commented: "Often times, while facing big problems hitting the whole community, we feel powerless when in fact we are not because every small change depends on us." Several students expressed pride, excitement and gratitude for having had a space to express their ideas and tackle climate change as teenagers: "I appreciated being able to develop an idea to solve a great problem together with my classmates"; "it was great to be at the centre of a project, and come up with practical solutions"; "I learned we can change the world starting from ourselves"; "Even 15-year-olds can contribute." These responses indicate the programme's efficacy in stimulating the students to envision different futures. Students also valued the opportunity to express their ideas publicly and be taken seriously. Group brainstorming and presentations fostered a sense of ownership, confidence and shared accomplishment. This seems to have led students to value working together in a new way:

"The hardest thing was to find intelligent and realistic solutions for a relatively big problem. Working in a group made this easier. I was most interested in the brainstorming, … as it made me understand that pooling ideas fosters great results with less effort."

The act of listening to others as an indispensable component of learning as well as participation was highly represented in student responses. Many expressed interest in being able to listen to presentations by others, learning new things and having the possibility to comment and give feedback: "I was most interested in hearing others' thoughts"; "my main takeaways are giving feedback, expressing my opinion, and learning new things." Presenting and moderating sessions afforded students an opportunity to experience the classroom as a space in which they, too, could be competent and share meaningful knowledge with others.

Regarding the second research question, participants' responses suggest that well-scaffolded group work in the classroom on actual matters contributes to bridging the gap between knowledge and action, helping students understand the breadth of their sphere of influence.

3. Mutual learning as a driver of human revolution and transformative ESD

Concerning mutual learning and human revolution, feedback from participants evidences that dialogic interactions are key in unlocking individuals' capacity to learn across chasms and bridge gaps, mobilising untapped potential. Group work, and more specifically group presentations, were unanimously described as the most challenging component of the programme. At the same time, working through challenges including communication issues, lack of time, tech issues and differing opinions was portrayed as a source of fulfilment and pride in the great majority of instances. Responses including comments on the challenges of collaborating towards a common goal can be read as proof of the students' willing engagement in dialogue across chasms: "I was surprised by the will and the unity of the class towards the new projects"; "I was most interested in the presentations, because there were several methods for improving the world, and I feel proud of this."

Beyond enabling students to hone transdisciplinary competences, cooperative learning was key in helping students familiarise themselves with and navigate the complexity of sustainability issues as well as participatory processes. Teachers and students agreed on this point: "[A teacher:] I was surprised by the students' interest for complex topics, their participation in proposing alternative solutions, and their oral presentations"; "[A student:] My main takeaways are the importance of taking care of the environment, listening to and understanding other people's ideas that make you think, and different points of view on the same topic."

The multiplicity of possible and legitimate perspectives on each issue was a source of amazement for many, who expressed interest in experiences of perspectival displacement: "It was interesting to understand different points of view on several issues, which allowed me to think better"; "working in group helps everyone improve." Significantly, several participants highlighted the importance of creativity and playfulness to deeply understand so-called wicked problems. In students' words, having fun while working on serious matters enabled them to come up with better solutions and learn faster: "I was most interested in the third session, when everyone was able to use their creativity to convey important messages"; "I liked how thinking about solutions entailed reasoning, but also enjoyment"; "I was struck by having fun while working on serious matters, and by the creativity I thought I didn't have." Participants' feedback suggests, in short, that curiosity, creativity and playfulness help individuals rise above challenges.

Regarding the third research question, responses evidence that carefully scaffolded participatory problem-solving led students to break through their own limitations, mobilising their "untapped resources of vision and creativity" (Peccei, 1979, p. xiii).

Bringing students at the centre of the learning experience was crucial to stimulating their curiosity, creativity and ability to overcome challenges along the way. This happened in an environment in which their role is often limited to regurgitating the knowledge they are expected to acquire. Participating in the programme, students felt they were able to contribute in a significant way — within the classroom and beyond — teaching something to all participants, including teachers, volunteer educators and project staff.

In sum, the programme's participatory educational practices based on problem solving at the local level sparked transformative learning experiences, fostering understanding of interconnectedness, a sense of agency and purpose and participatory skills. Students' feedback highlights that crucial ESD pedagogical elements do not require specific technology or infrastructure: place-based learning, mutual learning and participatory problem-solving can be experienced through dialogue, shared inquiry and scaffolded activities with the support of pen, paper, markers, or any other support for writing and drawing. Finally, findings suggest that to enhance ESD in other contexts, be they formal, informal or non-formal, providers of learning experiences should prioritise relational, place-based learning; devote space to student-led inquiry; and embrace the productive tension of participation. Importantly, they must trust the potential of learners to be — not *future* change-makers but the capable trailblazers of *today*.

Conclusion

This qualitative case study sheds light on an ESD pilot programme, offering input to bridge the gaps between knowledge and action, humans and their environment, and humans and other humans. While the conditions of public schools in Italy might differ greatly from other educational contexts, the programme's activities are easily replicable with limited infrastructure and resources. The hope, the excitement and the joy of learning expressed by participants testify to the transformative power of fostering anticipatory and participatory skills to achieve integration and innovation, as affirmed by the No Limits to Hope initiative.

Findings reveal that transdisciplinary and participatory learning experiences centred on local, real-life issues do have a powerful transformative impact on participants. As stated by Peccei in *No limits to learning*: "there is really no other way of turning the global situation around than by improving human quality and preparedness — and this is therefore what we must do" (Peccei, 1979, p. xv).

Students' feedback indicates that the programme addressed a crucial curricular

gap: individuals' ability to recognise their interconnections with the environment, both locally and globally. Many students reported learning about new individual behaviours to lessen greenhouse gas emissions and pollution, while an overwhelming majority reported a new awareness of the critical connection between thought and action, responding with phrases such as: "My main takeaway is that through small actions you can achieve great things." This signals the achievement of the programme's learning goals it also demonstrates that participants' inner potential was activated through curiosity, responsibility and creativity. Participant responses — ranging from personal awakening to the urgency of climate action — offer lived examples of human revolution (Ikeda & Peccei, 1984). Dialogic relationships and mutual learning were central to this process, which can (and should) take place within the classroom and beyond.

Ultimately, this study contributes to the growing body of research that seeks to reimagine ESD and education itself as a transformative process based on dynamic, dialogic circles of mutual growth, resonating with Ikeda's philosophy of human education (2021; see also Goulah, 2012, 2017, 2018). Further theoretical and empirical research is needed to expand our understanding of how to refine, scale and deliver participatory ESD in a world that urgently needs it.

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Climate anxiety, agency and systemic educational transformation in early childhood

Jane Spiteri[*]

Abstract

As climate change intensifies, its psychological and existential impacts on young children are only beginning to be recognised, particularly in climate-vulnerable small island states. Drawing on research conducted in Malta with children under eight, this article reveals a growing prevalence of climate anxiety in early childhood, driven by fragmented and fear-based understandings of environmental change. Without structured educational support, children risk developing a diminished sense of agency. This article advocates for embedding climate literacy into national curricula using developmentally appropriate, solution-oriented methods such as storytelling and nature-based learning. It calls for systemic reform in teacher education, family engagement and public discourse, arguing that climate education can enhance resilience and cultivate climate agency as well as eco-agency in young children.

The implications of the findings for educational policy are substantial. First, early childhood climate education must be embedded in national curricula, ensuring that climate literacy is introduced in an age-appropriate, solution-focused manner. Second, many teacher training programmes still do not include climate change education as a core component. Third, parental education initiatives must equip parents and caregivers with strategies to discuss climate change in constructive, solution-oriented ways.

The challenge therefore is not simply to replace fear-based narratives with hopeful ones but to cultivate pedagogical conditions in which children can metabolise

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uncertainty through relational support, ethical dialogue and opportunities for meaningful participation. In this sense, hope emerges not as reassurance but as a lived educational practice grounded in connection, care and shared responsibility. Addressing this gap is critical for developing accurate, empowering climate literacy. By integrating early childhood climate education into policies, policymakers can cultivate a generation that approaches environmental challenges with confidence, resilience and the knowledge to drive meaningful change.

Keywords: early childhood education, climate change education, climate anxiety, small island states, emotional resilience

Introduction

As humanity confronts the cascading crises of the Anthropocene, marked by intersecting crises of climate change, ecological degradation and sociopolitical instability, the role of education in enhancing resilience, agency and hope becomes increasingly indispensable (UNESCO, 2024). These crises are not only biophysical; they are also deeply psychological, cultural and educational, reshaping how people of all ages understand their place in the world and imagine the future. Yet mainstream educational paradigms, particularly in early childhood, have largely remained oriented towards mainstream learning, in which the reproduction of existing knowledge is the norm, and the adaptive, relational and anticipatory capacities needed in these times of profound uncertainty are not cultivated (Sterling, 2001). Educational systems, therefore, remains ill-equipped to engage with the emotional and existential dimensions of current global challenges (Spiteri, 2025a).

Situated in Malta, a small island state in the Mediterranean, this article foregrounds the psychological and epistemic impacts of climate change on children under eight. Malta, like many small island states, faces acute and unevenly distributed climate risks, including sea-level rise, heatwaves and ecological stress. For children growing up in similar places, environmental disruption is not an abstract problem but a lived and anticipated reality. The research on which this article is based involved two multimethod qualitative case studies conducted in Malta with children aged three to eight (Spiteri, 2023a, 2024, 2025b; Spiteri & Pace, 2023). The case studies draw on observations, interviews and participatory methods with young children and on interviews with early childhood educators, parents and school administrators. Ethical approval was obtained from education authorities in Malta, and informed consent was obtained from all participants.

The findings of these studies provide empirical evidence that young children in Malta are not only aware of environmental threats but are also emotionally affected by them, manifesting in phenomena such as worry (Spiteri et al., 2022) and climate anxiety (Spiteri & Pace, 2023). These findings challenge the current adult-centric assumption that young children are either too cognitively immature or emotionally detached to meaningfully engage with global crises (Chawla, 2020; Ojala, 2012). More importantly, the findings suggest that climate anxiety is not simply a product of individual temperament; rather, it is shaped by the narratives, silences and practices encountered across home, school and media environments (Spiteri, 2023b, 2024, 2025b).

Through an analysis of children's interactions with family and educators in educational contexts, the studies also reveal significant gaps in climate literacy among both educators (Spiteri, 2024) and parents (Spiteri, 2025b). Educators and parents often hold fragmented or inaccurate understandings of broader environmental issues, including climate change. These understandings tend to be entangled with socio-cultural beliefs and media narratives that emphasise catastrophe, blame or inevitability (Spiteri, 2024, 2025b). These gaps are not merely informational but are indicative of deeper cultural and discursive deficit that *No Limits to Learning* described as the "human gap," that is, the disconnect between humanity's unprecedented capacity to shape planetary systems and its limited capacity to foresee, care for and ethically navigate the consequences of its actions (Botkin et al., 1979). In the context of early childhood, this gap manifests as an educational failure to attend to children's emotional, relational and ethical needs in the face of climate disruption. Bridging this gap necessitates more than curricular reform; it requires a re-humanisation of learning practices that centre mutuality, ecological citizenship and intergenerational dialogue.

In response, this article advances two interlinked arguments that align with the vision articulated by the No Limits to Hope initiative. First, early childhood education must be recognised as a critical site for addressing the human gap by cultivating what is referred to here as climate agency and eco-agency in young children. Together, these forms of agency offer a pathway for transforming climate anxiety from a debilitating state into resilience and a generative, ethically engaged orientation to the world. Second, the article argues that realising this potential requires a systemic educational transformation rather than piecemeal curricular adjustments. Drawing on the No Limits to Hope initiative, it contends that early childhood education systems must become anticipatory, participatory and life-affirming, reconfiguring teacher education, curriculum design, family engagement and public discourse in

relational and hope-oriented ways. Malta's experience is used as a lens through which to explore these possibilities, while also speaking to broader international debates on climate change education in early childhood, including in other small-island states and in high-emitting countries.

The article proceeds as follows. It first outlines a conceptual framework that weaves together climate anxiety, climate agency, eco-agency and transformative learning. It then examines the policy and practice implications emerging from the Maltese case, organised around key principles for systemic educational transformation. These insights are situated within wider international debates on climate change education and educational transformation, before the article concludes with limitations, directions for future research and a renewed call to rehumanise learning in the face of the polycrisis.

Climate anxiety, climate agency and eco-agency in early childhood

Climate anxiety has emerged as a key concept in contemporary discussions of the psychological dimensions of climate change, often referring to feelings of worry, fear, or distress about environmental degradation and its future consequences (Clayton et al., 2023; Hickman et al., 2021; Pihkala, 2022). In this article, climate anxiety is not treated solely as a clinical or pathological condition but as a relational and context-dependent response that can be either intensified or transformed by educational experiences.

While much of the literature has focused on adolescents and young adults, recent work highlights that children under eight also experience and express climate-related concerns, even if these are mediated through concrete, everyday experiences and imaginative narratives (Spiteri & Pace, 2023). In Malta, children spoke about "bad weather," heat, pollution and harm to animals, often linking these phenomena with moral evaluations of human behaviour (Spiteri & Pace, 2023). Such expressions suggest an emerging moral and relational engagement with environmental change, intertwining cognitive, affective and ethical dimensions (Spiteri, 2025a). When children repeatedly encounter narratives of catastrophe, blame and inevitability or when adults shut down conversations because they are perceived as too uncomfortable, climate anxiety may become immobilising. Conversely, when children are supported to make sense of environmental change through age-appropriate, hopeful and action-oriented narratives, their anxiety can coexist with, and even fuel, a sense of agency and responsibility (Ojala, 2012; Spiteri, 2023b, 2025b).

To capture this transformation potential, the article advances the twin concepts of climate agency and eco-agency. Climate agency refers to a child's emerging capacity to understand climate-related issues in developmentally appropriate ways and to perceive themselves as capable of acting (individually and collectively) in response, however modestly. Climate agency encompasses skills such as asking critical questions, imagining alternatives and engaging in everyday practices that align with sustainability. Eco-agency, by contrast, refers to the affective and relational dimensions of children's connection with the more-than-human world, grounded in relational experiences of nature and community (Spiteri, 2020, 2023a).

Although analytically distinct, climate agency and eco-agency are deeply intertwined in children's lived experiences. For example, a child who feels attachment to a local beach, tree or animal may experience distress when that environment is degraded but can also be motivated to participate in clean-ups, advocacy or caring practices. Educational approaches that nurture these forms of agency, such as storytelling, nature-based learning and play-based exploration, help children integrate knowledge, emotion and action in ways that are developmentally appropriate and psychologically protective (UNESCO, 2022; Spiteri, 2023a).

From maintenance to transformative learning

The move from climate anxiety to climate and eco-agency is closely linked to the distinction between maintenance and transformative learning in education. Maintenance learning focuses on transmitting established knowledge and social norms, often treating children as passive recipients of information. In the context of climate change education, this can take the form of simplified messages about recycling or polar bears that neither address systemic causes nor attend to children's emotional responses. Transformative learning, by contrast, involves questioning assumptions, engaging in critical reflection and reshaping children's relationship with self, others and the world.

Applied to early childhood, transformative learning does not mean burdening young children with abstract geopolitical complexities, but rather recognising their relational ways of knowing and creating space for them to explore questions, emotions and possibilities in embodied, playful and dialogic ways (Chawla, 2020; Spiteri, 2023b). Storytelling, imaginative play, nature walks and collaborative projects can all become sites of transformative learning when they invite children to connect with place, recognise interdependence and practise small-scale forms of agency. Such practices mirror the relational, emergent and co-evolutionary character of living

systems, aligning with the No Limits to Hope call to reconnect education with life.

The Maltese case studies included in this article illustrate both the persistence of maintenance learning and the possibilities for transformative approaches. On the one hand, the research identified classrooms in which climate change was either absent or addressed in a purely informational, sometimes fear-inducing manner (Spiteri, 2023b, 2024). On the other hand, there were examples of educators who used stories, local places and child-led projects to foster curiosity and care, thereby supporting children to navigate their worries and envisage constructive actions (Spiteri, 2023a, 2024). These examples offer concrete starting points for rethinking early childhood education systems more broadly.

Policy implications: pathways towards systemic educational transformation

Building upon the empirical findings from my research and the theoretical frameworks outlined from it, the educational implications of climate change in early childhood are both urgent and farreaching. The urgency of addressing the educational dimensions of climate change in early childhood contexts calls for systemic reforms that extend across curricular design, teacher education programmes, family engagement and societal discourse. Rather than treating these domains as discrete, this synthesis brings them together to articulate how education systems can respond coherently to the intersecting ecological, emotional and social challenges of the Anthropocene. What follows is an exploration of how policy can address the educational dimension of climate change across sectors based on the findings from my systemic research around climate change, education and early childhood.

1. Embedding climate education in early childhood curricula through transformative learning

My research demonstrates the necessity of embedding climate education within early childhood curricula, particularly in ecologically vulnerable contexts such as small-island states (Spiteri, 2024, 2025; Spiteri & Pace, 2023). Such integration must be developmentally appropriate and emotionally attuned, combining cognitive understanding with affective and relational engagement. Educational approaches rooted in storytelling, play based learning, outdoor education and experiential pedagogies emerge as especially effective in supporting young children's meaning making around environmental change. These approaches enable children to engage with climate realities in ways that are constructive rather than overwhelming, fostering early forms of environmental stewardship and resilience.

Importantly, these pedagogies move early childhood education beyond maintenance learning, characterised by the transmission of established knowledge, and towards transformative learning that cultivates adaptive, critical and participatory capacities. As evidenced in comparable initiatives in other small-island developing states, such as Barbados and Fiji, early climate education grounded in lived experience has been associated with enhanced child agency and community resilience (UNESCO, 2022). Positioning early childhood education as a site of transformative learning thus allows young children to develop hopeful, action-oriented responses to climate change from the outset of their educational trajectories.

2. Reconceptualising teacher education as climate-responsive mutual learning

Across the studies informing this article, early childhood educators were found to frequently reproduce inaccurate or fearbased climate narratives, often shaped by sociocultural beliefs rather than scientific understanding (Spiteri, 2023b, 2024). This highlights the need for a fundamental reorientation of both initial teacher education and ongoing professional development. Climate literacy must be embedded not merely as content knowledge but as a crosscutting pedagogical competency encompassing critical thinking, emotional intelligence and adaptive communication.

Teacher education programmes should therefore be reconceptualised as spaces of mutual learning, where educators are supported to coconstruct knowledge alongside children, families and communities. Drawing on dialogic and transformative models of education (Freire, 2005; Sterling, 2001), this approach challenges linear and instrumental conceptions of teaching and recognises educators themselves as learners within an evolving ecological, cultural and emotional landscape. Building educators' capacity to engage with the emotional dimensions of climate change, particularly in early childhood contexts, is essential for enacting pedagogies grounded in care, agency and relational responsibility.

3. Extending climate change education beyond schools: Families and intergenerational dialogue

Research findings further underscore the central role of families in shaping children's emotional and ethical orientations towards climate change. Children's experiences of climate anxiety and agency are deeply influenced by the affective tone, language and framing of climate related conversations within the home (Spiteri, 2023b, 2025b). When families engage children through narratives of care, collective responsibility and possibility, children demonstrate lower anxiety and stronger eco social identities.

Educational policy must therefore extend beyond formal institutions to support family centred and community-based climate literacy initiatives. These may include intergenerational storytelling programmes, parent workshops and locally grounded learning spaces that equip caregivers with the confidence and narrative tools needed to engage children in hopeful, solution-oriented dialogue. Such initiatives model intergenerational mutual learning and align with broader calls to re-establish education as a shared cultural endeavour rather than a top-down transmission of knowledge.

4. Reframing public discourse and educational paradigms: From climate anxiety to relational agency

Beyond curricular and institutional reforms, this research identifies the need for a broader cultural and discursive shift in how climate change is communicated to and around children. Dominant public narratives that centre catastrophe and inevitability risk paralysing not only children but also educators, parents and communities. In contrast, reframing climate change through relational, adaptive and collective lenses enables education to function as a space of empowerment rather than despair.

Early childhood emerges in this research as a dynamic site of meaning making rather than a passive developmental stage (Spiteri & Pace, 2023). Recognising that young children have a voice and agency and are, therefore, capable ecological citizens, challenges adult-centric assumptions embedded in prevailing educational and policy frameworks. This shift echoes wider calls to move beyond instrumental rationalism towards relational, life-based paradigms of learning that foreground connection, care and shared responsibility.

5. Towards integrated national climate literacy frameworks

Taken together, these findings support the development of integrated climate-literacy frameworks that span formal education, nonformal learning and lifelong community engagement. Such frameworks should be contextually grounded, culturally responsive and interdisciplinary, with particular sensitivity to the lived realities of communities facing acute climate risks. By prioritising ecological citizenship and emotional resilience alongside knowledge and skills, these frameworks can serve as blueprints for cultivating informed, ethically engaged and adaptive societies. Especially in small-island states facing acute climate risks, these frameworks of belonging can serve as blueprints for cultivating emotionally resilient, informed and proactive societies able to overcome the impacts of climate change.

Bridging the human gap through early climate education

These research findings align with international imperatives for educational transformation, most notably the No Limits to Hope initiative. This framework advocates for anticipatory, participatory and integrative learning as the primary mechanism for bridging the "human gap," the disconnect between escalating global complexity and our collective capacity to navigate it (Botkin et al., 1979). In ecologically vulnerable contexts such as Malta, the prevalence of climate anxiety among children under eight (Spiteri & Pace, 2023) should not be dismissed as individual pathologies. Rather, it represents a systemic failure of contemporary educational paradigms to address the relational and emotional dimensions of the Anthropocene (Chawla, 2020; Ojala, 2012; Spiteri, 2025a).

Addressing this failure requires a multi-scalar reorientation of early childhood education towards transformative and hope-oriented pedagogies. Taken together, the findings of this research point to a coherent model of systemic transformation in early childhood climate education, structured around four mutually reinforcing domains: curriculum, teacher education, family engagement and public discourse. Rather than discrete interventions, these domains function as an integrated ecology of learning that shapes how children encounter, interpret and respond to climate change. It represents a radical shift in public discourse, which moves from fatalistic, catastrophic narratives towards a relational, life-based paradigm that centres adaptive capacity and collective agency.

A discursive shift: from passive vulnerability to ecological citizenship

Early childhood must therefore be understood not as a preparatory or passive developmental stage but as a dynamic period of meaning-making in which children actively interpret, emotionally respond to and relationally engage with environmental change. Recognising young children as capable, situated sense-makers challenges entrenched adult-centric assumptions in education and policy and reframes early childhood as a critical site for cultivating climate-related understanding, care and agency. Such a shift ensures that education is once again aligned with the requirements of life itself, equipping the youngest members of society to navigate the climate crisis with care, intentionality and informed agency.

Limitations and pathways for future research

While this research provides a granular analysis of climate literacy and emotional affect within the unique context of a small-island state (Malta), several methodological and contextual boundaries must be acknowledged to inform future research and policy scaling.

The findings are situated within the specific ecological and socio-political landscape of Malta. As a high-density island state uniquely vulnerable to marine and thermal climate impacts, the manifestations of climate anxiety here may differ from those in larger countries or more economically diverse regions. Consequently, while the relational principles identified are broadly applicable, the specific pedagogical applications require cross-cultural validation through comparative international studies.

The qualitative nature of this study prioritised in-depth description and understanding of young children's lived experiences. However, to inform large-scale national educational reforms, future research should employ mixed-method architectures. Integrating qualitative insights with quantitative metrics, such as standardised eco-anxiety scales or climate literacy benchmarks, will provide the statistical power necessary to track broader demographic trends and measure the efficacy of specific educational interventions.

A primary limitation of current research in early childhood climate education is its cross-sectional nature. To understand the long-term impact of climate change education and hope-oriented pedagogies, longitudinal research is essential. Tracking a cohort of children from early childhood into adolescence will determine whether early interventions successfully create sustained ecological agency and mitigate the risk of environmental generational amnesia and of long-term fatalism. The necessity for longitudinal inquiry is further underscored by the risk of environmental generational amnesia (Kahn, 1999, 2002). This phenomenon suggests that each generation constructs its conception of normal environmental health based on the degraded baseline they inherit. Without sustained educational intervention, children may normalise the ecological precarity of the Anthropocene, failing to recognise the extent of environmental loss. Future research must therefore investigate how transformative pedagogies can disrupt this cycle of normalisation, ensuring that hope-oriented frameworks do not inadvertently lead to the passive acceptance of a diminished natural world but rather serve as a catalyst for restoration and agency.

Policy recommendations

Immediate priorities for policymakers should include the integration of age-appropriate climate literacy into early years frameworks within the next two to three years, ensuring that young children are introduced to environmental issues in a constructive and empowering manner. To support this, national funding streams must be established for the professional development of educators, enabling them to adopt climate-responsive pedagogies with confidence and competence. Intergenerational storytelling initiatives and nature-based engagement programmes should be launched, particularly within vulnerable communities, to strengthen ecological connection and communal resilience. Additionally, the co-creation of climate literacy materials for parents and caregivers, in collaboration with educators and child psychologists, will ensure that families are equipped to engage in supportive, hope-based conversations with children. Collectively, these actions lay the groundwork for cultivating a generation that responds to climate challenges not with fear, but with informed agency, ethical awareness and adaptive confidence.

Conclusion

This article has argued that early childhood education constitutes a critical but under-recognised, site for responding to the psychological and ethical dimensions of climate change. Drawing on empirical research from Malta, it has demonstrated that climate anxiety in young children reflects systemic educational gaps rather than individual vulnerability, while also revealing the transformative potential of relational, participatory and hope-oriented pedagogies.

By aligning early childhood education with the aims of the No Limits to Hope initiative, the article calls for policy frameworks that recognise and build upon young children's existing capacities for care, meaning-making and agency. Through curricular integration, educator empowerment, family engagement, cultural reframing and structural innovation, educational policy can play a transformative role in addressing the psychological and epistemic dimensions of the climate crisis.

Situating early climate literacy as a manifestation of the "human gap" highlights the need for systemic educational change, particularly in climate-vulnerable and small-island contexts. Such a reorientation moves education beyond abstract knowledge acquisition towards practices of relational knowing, resilience and ethical becoming. These shifts are not only pedagogical but civilisational, contributing to broader efforts to rehumanise learning and to reshape humanity's relationship with a rapidly changing planet.

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Bridging the human gap through data-driven, multilingual and holistic student success interventions in engineering education

*Hlengiwe Mhlongo, Ntokozo Sindane, Malibongwe S. Manono and Athenkosi Nzala**

Abstract

In response to global calls to reimagine education, the Faculty of Engineering & the Built Environment at the University of Cape Town pioneered a transformative project. Grounded in systemic, anticipatory and participatory learning principles, the Student Success Project aims to foster inclusive academic environments. Key interventions include an early risk-assessment framework, peer-led study groups and mentorship, and a multilingual digital glossary in isiXhosa, Sesotho, Kiswahili, Afrikaans and accessible English. These are integrated into a data-driven, AI-enabled student success hub for personalised support. By confronting academic exclusion and language marginalisation, the project demonstrates how higher education can bridge the "human gap" and cultivate learner agency, shifting from maintenance to transformative learning. This work offers a replicable model for empowering educators and learners to co-create equitable futures.

Keywords: transformative learning, multilingual education, systemic change, student success, inclusive pedagogy

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Introduction

The 1979 Report to the Club of Rome, *No Limits to Learning*, identified a critical "human gap" between humanity's technological capabilities and our understanding of their consequences (Botkin et al., 1979). Today, this gap has widened dramatically as we face the interconnected crises of climate change, social inequality and educational inadequacy. As the No Limits to Hope initiative notes, despite our increased knowledge, institutions continue to deliver mostly "maintenance learning," which fails to anticipate or prevent systemic crises. The continuation of these crises underscores that the challenge outlined by Peccei's original question — Can this gap be bridged before a tragic fate overtakes humanity? — remains urgent.

In *No Limits to Learning*, the authors underscored that educational institutions were failing to anticipate and prevent systemic crises, offering only "maintenance learning" rather than modes of learning that are anticipatory, participatory and innovative. These concerns are echoed in the No Limits to Hope initiative, which calls for a transformative-learning paradigm capable of addressing today's complex societal challenges. In South Africa's higher education landscape, the human gap manifests in persistent inequalities rooted in apartheid's legacy. At the University of Cape Town's Faculty of Engineering & the Built Environment (EBE), these challenges include language barriers, socio-economic disparities and academic systems that often perpetuate exclusion rather than foster inclusion (Badat, 2010). The EBE Student Success Project, which embeds proactive and participatory practices that reflect the transformative ethos advocated in No Limits to Hope, exemplifies an attempt to move beyond maintenance learning. By encouraging collaborative peer learning, responsive mentoring and reflective practices, the project aligns with the call to bridge the human gap through more inclusive and systemic approaches to student development.

Bridging the human gap within the University of Cape Town's EBE faculty demanded a reconfiguration of student support. The project embedded transformative-learning principles into institutional structures. Anticipatory changes included the use of real-time academic tracking systems to structurally vulnerable students early, enabling timely and targeted interventions. Participatory approaches were implemented through peer-led study groups, collaborative learning communities and student advisory panels that gave voice to learners' lived experiences. Innovative responses involved creating inclusive mentorship models, integrating psychosocial support and fostering a culture of relational learning that prioritised belonging and resilience. These interventions, grounded in equity and responsiveness, illustrate how education can serve as a bridge across the human gap and align action with

understanding and systemic change with student transformation.

This case study demonstrates how a single faculty's commitment to systemic change can create ripple effects that extend beyond institutional boundaries. By reimagining student support through anticipatory, participatory and innovative approaches, the project offers a practical model for bridging the human gap through education. These efforts not only addressed academic underperformance but also reshaped the student experience by embedding equity, care and adaptability at the heart of institutional culture.

Theoretical framework: from maintenance to transformative learning

The distinction between maintenance learning and innovative learning, first articulated in *No Limits to Learning*, provides this case study's theoretical foundation. Maintenance learning focuses on acquiring predetermined skills and knowledge to maintain existing systems, while innovative learning emphasises problem-solving, critical thinking and adaptation to new circumstances (Botkin et al., 1979).

The shift from maintenance learning — focused on transmitting existing knowledge — to transformative learning involves a fundamental rethinking of the purpose and process of education. Transformative learning emphasises not just content mastery but the development of critical awareness, self-reflection and the capacity to engage with complexity. This paradigm has been shaped by theorists such as Jack Mezirow, Paulo Freire and Edward Taylor, who emphasise the importance of questioning assumptions, engaging in dialogue and linking learning to broader societal change.

In the context of engineering education, this means moving beyond technical competency to cultivate systems thinking, cultural awareness and ethical responsibility. Researchers like Kabo and Baillie (2009) argue that because engineering problems are embedded in complex social and environmental systems, engineering education must foster the ability to navigate uncertainty, relate across difference and co-create sustainable solutions. Transformative learning thus provides a framework for developing engineers who are not only skilled, but socially conscious and capable of addressing the multidimensional challenges.

The EBE Student Success Project operationalises these theories through four key principles that align with transformative learning and the No Limits to Hope framework:

- Anticipatory learning: Proactively identifying and addressing academic challenges through data-driven early warning systems.
- Participatory learning: Empowering students to co-design and implement support structures, fostering ownership and agency.
- Integrative learning: Adopting holistic strategies that address academic, social and emotional dimensions of student success.
- Innovative learning: Leveraging technology and multilingual, culturally responsive pedagogies to create inclusive learning environments.

These principles translate theoretical commitments into tangible interventions, contributing to the bridging of the human gap in South African higher education.

Context and challenges

The University of Cape Town, Africa's leading research university, serves approximately 29,000 students from diverse linguistic, cultural and socio-economic backgrounds. The Faculty of Engineering & the Built Environment enrols over 3,000 students annually, with first-year cohorts reflecting South Africa's linguistic diversity: approximately 40% are English-first-language speakers, 25% Afrikaans-first-language speakers, 20% isiXhosa speakers and 15% speakers of other African languages.

Historical data revealed persistent achievement gaps correlating with language background, socio-economic status and prior educational experience. Between 2018 and 2020, first-year failure rates in core engineering modules ranged from 15% among English-first-language speakers to 35% among students whose first language was not the medium of instruction. These disparities represent more than statistical variation — they reflect an institutional failure to anticipate and respond to the diverse realities of learners. This exemplifies the "human gap" identified in No Limits to Hope: the disconnection between educational systems' ability to act (by delivering content) and their inability to understand and transform the lived experience of students. Without addressing these structural inequities, learning remains stuck in maintenance mode, unable to catalyse meaningful change.

The COVID-19 pandemic did not create inequalities, but it did magnify them. Remote learning exposed the extent of the digital divide and deepened the social isolation experienced by many students, especially those already disadvantaged by systemic barriers. In this sense, the pandemic functioned as a stress test, revealing how unprepared traditional maintenance-learning models were to respond to complexity and crisis. However, it also became a catalyst for innovation, accelerating

the development of the Student Success Project as an integrated response to both immediate needs and longer-term transformation goals aligned with No Limits to Hope.

Case study: The EBE Student Success Project

Project genesis and design principles

Launched in 2021 under the leadership of the dean's office and funded through the University Capacity Development Programme, the EBE Student Success Project was developed with extensive consultation with students, staff and community partners. The project was conceived not as a remedial intervention but as a systemic and sustainable transformation of the learning environment, one that directly engages with the "human gap" articulated in *No Limits to Learning*. Its design reflects the core principles of transformative learning: it is anticipatory, participatory, integrative and innovative.

The intervention is structured around four interlinked components:

- Component 1: A comprehensive digital glossary designed to improve conceptual access and learning in engineering education. This resource specifically addresses language barriers by providing multilingual explanations of fundamental engineering concepts, with particular focus on students whose first language is not English.
- Component 2: An early risk assessment framework that uses data analytics to identify students at risk of academic failure, enabling timely, preventative interventions rather than reactive support.
- Component 3: Peer-led study groups and mentorship programmes, which centre students as co-creators of knowledge and build inclusive, collaborative learning communities.
- Component 4: An AI-enabled student success hub, which integrates all components into a digital platform that offers students personalised support pathways, learning resources and continuous feedback.

The integrated framework establishes a comprehensive learning environment that addresses both academic and non-academic dimensions of student success. By incorporating students' diverse lived experiences, the project facilitates a pedagogical shift from maintenance learning to transformative learning (Mezirow, 2000). This approach simultaneously addresses systemic barriers and relational challenges,

enabling students to not only persist but flourish within the institutional context.

The governance model, embodied in the Student Success Advisory Committee, reinforces these principles. Comprising equal representation of student and staff stakeholders, this body oversees strategic decision-making while ensuring student perspectives remain central to programme development. This structure exemplifies an intentional cultural transformation within the institution and aligns with the vision set out in *No Limits to Learning* whereby education is a catalyst for equity, inclusion and resilience (Botkin et al., 1979).

Component 1: Multilingual digital glossary

Recognition that language barriers constitute a primary obstacle to academic success led to the development of a comprehensive multilingual digital glossary. This resource translates core engineering and built-environment concepts into isiXhosa, Sesotho, Kiswahili, Afrikaans and accessible English, with audio pronunciations and contextual examples designed to support comprehension in diverse linguistic contexts.

Development involved collaboration with linguistics experts, community translators and student focus groups, ensuring cultural and disciplinary accuracy while centring student voices. The glossary now contains over 2,000 terms across six languages, which are fully integrated into the AI-enabled Student Success Hub and are accessible via mobile platforms. Usage analytics demonstrate consistent engagement, with over 15,000 monthly searches, and student feedback highlights increased confidence, improved conceptual understanding and a sense of linguistic belonging.

Beyond translation, the glossary represents a deliberate act of epistemic inclusion, validating diverse ways of knowing and communicating technical ideas. By bridging Indigenous languages with disciplinary language, it aligns with decolonial education principles and actively challenges the dominance of English as the sole academic language (Shizha, 2013). This approach transforms learning from a one-way transmission model to a relational, inclusive and empowering learning environment. It equips students not just to decode existing knowledge but to co-construct it through linguistic and cultural relevance.

Component 2: Early risk assessment framework

The project developed a comprehensive risk assessment framework that expands beyond conventional academic metrics to address three key areas of student vulnerability: academic performance, socio-economic challenges and mental health. The framework incorporates two culturally adapted assessment tools: the Academic Resilience Scale and the Engineering Student Stress Surveys, both specifically validated for South African university students. Trained Student Hub ambassadors administer the culturally adapted surveys at strategic intervals throughout the academic term. The collected data flows directly into the customised Student Hub analytics dashboard, which employs automated algorithms to process responses in real-time. This system enables the immediate identification of students who may benefit from additional support, while maintaining strict confidentiality protocols. The dashboard's visualisation tools allow both students and advisors to track progress and access relevant resources, creating a transparent and empowering support ecosystem.

The assessment process occurs at three critical points during the academic cycle:

- Orientation period — to identify transition challenges
- Mid-semester review — to detect emerging difficulties
- Pre-assessment phase — to prevent potential crises

This approach builds on established educational models while incorporating local perspectives. It draws from Ubuntu philosophy to create a strength-based system (Letseka, 2014). Rather than labelling students as "at-risk," the framework focuses on identifying specific support needs while recognising each student's existing capabilities.

The framework's effectiveness is evidenced by improved early intervention rates and reduced crisis-level support needs. Students appreciate the framework's non-stigmatising approach and its focus on empowerment rather than remediation.

Component 3: Peer-led study groups and mentorship

Research has consistently demonstrated the importance of social integration for student success in demanding engineering programs. Studies by (Talar et al., 2025) revealed that strong interpersonal relationships and meaningful social engagement significantly enhance students' academic commitment and persistence. Their findings specifically recommend that engineering faculties develop diverse

student activity groups and organised events to cultivate these essential connections. These recommendations prove particularly relevant for underrepresented student populations, as (Lucietto et al., 2023) established that such students frequently lack vital institutional and peer connections, rendering them especially susceptible to attrition or major switching.

To address these documented needs, the project established structured peer-led study groups facilitated by trained student mentors. These groups serve dual purposes: providing crucial academic support for challenging engineering coursework while simultaneously fostering the social connections shown to improve student retention. The groups utilise collaborative learning techniques that enhance both academic performance and the teamwork skills fundamental to engineering practice. This approach proves particularly effective by creating organic support networks among students encountering similar academic challenges.

The program's effectiveness depends significantly on its robust mentor-training curriculum, which incorporates three key components from transformative-learning theory. First, mentors receive intensive instruction in facilitation skills to guide productive study sessions and promote inclusive discussions. Second, they complete cultural competency modules designed for working with diverse student populations. Third, training in systems navigation equips mentors to help peers access appropriate academic resources and support services. This thorough preparation ensures mentors can identify various learning styles, manage group dynamics effectively and connect students with targeted assistance.

Evaluation data indicate the peer support initiative generates strong outcomes regarding both retention and satisfaction. Participants report increased confidence, enhanced study strategies and a stronger sense of belonging within the faculty community. These results align with established research on the benefits of peer learning in STEM education and demonstrate the program's effectiveness in addressing key challenges faced by engineering students.

Component 4: AI-enabled Student Success Hub

The AI-enabled Student Success Hub serves as the digital backbone of the EBE Student Success Project integrating all components into a single, cohesive platform that bridges the gap between students and staff. More than a data dashboard, the Hub operationalises the project's anticipatory, participatory and innovative principles by facilitating real-time feedback loops, personalised interventions and relational engagement. Using artificial intelligence, the Hub aggregates data from academic

performance, digital engagement and self-reported wellbeing indicators to generate individualised support pathways. Machine learning algorithms identify patterns associated with academic risk such as inconsistent attendance, missed assignments, or low resource utilisation and issue alerts or tailored recommendations. When red flags are triggered, students are proactively connected to relevant services, such as tutoring, peer mentoring or counselling; they nevertheless retain their agency and data privacy.

Crucially, the platform does not operate in isolation. It creates a collaborative feedback system in which academic staff and support teams can track student progress, respond to needs in a timely manner and engage in meaningful, data-informed dialogue. This positions the Hub as a relational interface, fostering a culture of responsiveness and care rather than surveillance or control.

Designed through iterative consultation with student focus groups, the Hub's interface prioritises usability and trust. Students report high satisfaction, emphasising that the system feels supportive rather than punitive and enhances their sense of being seen and understood. In this way, the Student Success Hub not only connects technological and human components but exemplifies how digital innovation can enable transformative, student-centred learning ecosystems.

Implementation and methodology

The project employed an **action research methodology**, structured around continuous cycles of planning, implementation, observation and reflection (McNiff, 2009). This iterative approach enabled the project team to respond dynamically to emerging challenges while upholding rigorous standards of inquiry and accountability. Each cycle typically involved piloting an intervention (e.g. peer-led study groups or glossary updates), collecting real-time feedback, reflecting on outcomes with stakeholder input and refining the next iteration accordingly.

Data collection combined quantitative and qualitative approaches. Quantitative metrics included academic performance (pass/fail rates, average marks), retention rates and usage analytics from the Student Success Hub (e.g. glossary searches, login frequency, risk-alerts triggered). Qualitative methods encompassed focus groups, semi-structured interviews and participant observation across multiple cohorts. These were conducted at key points during the academic year (e.g. mid-term, exam season, post-semester review) to capture evolving experiences.

A **mixed-methods analysis** was employed to triangulate findings, allowing the team to explore not only *what* was changing but *why*. Quantitative trends were

interpreted in light of student narratives and contextual factors, creating a more holistic understanding of impact and areas needing improvement.

Importantly, **students were engaged as co-researchers** throughout the process. They helped shape research questions, co-designed interview guides, facilitated peer feedback sessions and contributed to interpreting results during reflection workshops. This participatory ethos reflected the democratic ideals of transformative-learning theory and enriched the research with deeper authenticity and contextual insight. This methodological approach ensured that the project remained **grounded, adaptive and inclusive** — continually evolving in response to the complex and diverse needs of the EBE student body.

Outcomes and impact

The Student Success Project's outcomes reflect not only statistical gains but also meaningful alignment with the transformative-learning principles embedded in its design. By integrating anticipatory, participatory and inclusive strategies across all components, the project has demonstrably shifted institutional practices away from maintenance learning and towards systemic transformation.

Quantitative results

After three years of implementation, the project demonstrates significant positive impacts across multiple dimensions:

- First-year retention rates increased from 78% to 89% among project participants, reflecting the effectiveness of early risk identification and proactive support enabled by the AI-powered Student Success Hub.
- Achievement gaps between language groups decreased by 40%, illustrating the success of the multilingual glossary in enhancing epistemic access and reducing language-based exclusion.
- Student satisfaction with academic support services rose from 65% to 92%, aligning with the project's participatory design approach, which embedded student voices in support system development.
- Mental health support utilisation increased by 60%, indicating not only increased help-seeking behaviour, but also a growing sense of trust and psychological safety cultivated through integrated, student-centred support.
- Glossary-usage data revealed a strong positive correlation between glossary

engagement and academic performance in technical modules — affirming the link between linguistic inclusion and cognitive performance.

These improvements occurred despite external challenges such as the residual impacts of COVID-19 and ongoing economic hardship, underscoring the resilience and adaptability of a well-integrated, student-responsive system.

Qualitative findings

Interviews with students reveal impacts that extend well beyond academic performance. Participants report enhanced self-efficacy, cultural pride and belonging, particularly in response to multilingual resources and peer-led initiatives. Many described feeling "seen and valued" by the institution for the first time, indicating a transformation in institution-student relationships, an essential element of participatory and relational learning.

Faculty reflections highlight improved classroom dynamics, greater student engagement and increased openness to alternative ways of knowing. Some lecturers have adapted their teaching practices to include multilingual examples or more inclusive forms of assessment, demonstrating a shift towards integrative pedagogy.

At the institutional level, the project has influenced policy changes in language support, academic development and student services coordination. These systemic shifts show that the project not only improved individual outcomes but also catalysed broader conversations about inclusive excellence and institutional transformation — hallmarks of the No Limits to Hope vision.

Broader implications: bridging the human gap

The EBE Student Success Project demonstrates practical approaches to bridging the human gap identified in *No Limits to Learning*. By addressing systemic inequalities through anticipatory, participatory and innovative interventions, the project creates conditions for transformative learning that extends beyond individual academic success.

The project's multilingual approach challenges dominant assumptions about language in technical education, demonstrating that linguistic diversity strengthens rather than threatens academic rigour. This finding has implications for engineering education globally, particularly in multilingual contexts.

The integration of artificial intelligence with human-centred design offers

a model for technology-enhanced education that augments rather than replaces human relationships. The project shows how digital tools can facilitate rather than impede the social connections essential for transformative learning.

Scaling and replication

The project's design emphasises adaptability and transferability, with components that can be modified for different institutional contexts while maintaining core principles. Key factors for successful replication include:

- Leadership commitment to transformative rather than maintenance learning
- Student involvement in design and implementation processes
- Integration of local languages and cultural knowledge systems
- Technology platforms that enhance rather than replace human connections
- Comprehensive evaluation systems that capture both quantitative and qualitative outcomes

Several South African universities have begun implementing adapted versions of project components, with the University of the Witwatersrand and Stellenbosch University developing similar multilingual resources and peer support programmes.

International interest has emerged from universities in Kenya, Ghana and India, where similar linguistic diversity and socio-economic challenges create parallel needs for transformative educational approaches.

Challenges and limitations

Implementation challenges included resource constraints, technological difficulties and resistance to change within established institutional structures. The project's reliance on external funding creates sustainability concerns that require ongoing attention.

Cultural sensitivity in multilingual resource development proved more complex than anticipated, requiring extensive community consultation and iterative refinement processes. Balancing standardisation with cultural authenticity remains an ongoing challenge.

The project's impact on long-term career outcomes and societal contribution requires longitudinal study extending beyond current evaluation timeframes. While

short-term indicators are positive, ultimate success must be measured through graduates' contributions to addressing the global challenges identified in No Limits to Hope.

Future directions and recommendations

The project's next phase focuses on deepening community partnerships, expanding multilingual resources and developing alumni networks that support ongoing transformation. Plans include establishing similar initiatives in rural campuses and creating exchange programmes with international partner institutions.

For the broader No Limits to Hope initiative, this case study offers several recommendations:

- Prioritise linguistic inclusion as fundamental to educational transformation
- Invest in technology platforms that facilitate rather than replace human connections
- Develop evaluation frameworks that capture transformative-learning outcomes beyond traditional academic metrics
- Create networks for sharing innovative practices across institutional and national boundaries
- Advocate for policy changes that support multilingual, multicultural educational approaches

Conclusion

The University of Cape Town's EBE Student Success Project demonstrates that bridging the human gap requires more than good intentions, it demands systemic change grounded in principles of anticipatory, participatory and innovative learning. By addressing language barriers, leveraging technology for human connection and positioning students as co-creators of their educational experience, the project creates conditions for transformative learning that extends far beyond individual academic success.

This case study affirms Peccei's optimism about human learning potential while providing concrete evidence that educational transformation can address the pressing challenges facing humanity. The project's success suggests that there truly

are "no limits to learning" when educational institutions commit to bridging rather than perpetuating the human gap.

As we face unprecedented global challenges, the lessons from this case study offer hope and practical guidance for educators worldwide. The path forward requires not just technical innovation but the fundamental transformation of how we understand learning, community and human potential. The University of Cape Town's EBE Student Success Project provides one model for this transformation—a model that is grounded in local knowledge but is globally relevant, that is technologically sophisticated but fundamentally human.

The journey towards educational transformation continues, guided by the conviction that learning has no limits when barriers are removed and human potential is truly unleashed. In bridging the human gap, we create not just better students but better futures for all.

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Learning to affirm open futures: interventions for situated practices

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Abstract

This article presents three interventions developed by the Crosscultural Research in Architecture Collective (CRAC) with the aim of fostering situated practices. Integrating Eastern relational thinking, decolonial and feminist theories and the radical pedagogies of Paolo Freire and Augusto Boal, these interventions challenge Western architectural discourse's emphasis on static forms and technological fixes, failing to successfully address the ongoing ecological crises. Our interventions open alternatives to these approaches.

The first intervention, *A Hat for Three at a Picnic* (2012–2019), engaged over 800 architecture students at Xi'an Jiaotong–Liverpool University in designing wearable architectural devices that moderate social dynamics through role-play and collaborative material exploration. Students worked with everyday materials to create dynamic wearables for complex character interactions, emphasising architectural design as social technology.

The second intervention, TEXTILE-lab (2023–present), establishes a platform at the Norwegian University of Science and Technology that weaves together analogue textile crafts with architectural education. Students engage with traditional techniques, such as wool spinning and weaving, to develop transdisciplinary practices

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and embodied learning.

The third intervention, *SKIRTs*: Appropriating Public Space (2025), involves wearable soft architectures that activate public spaces through feminist performative methods. Students create participatory architectural events that question spatial ownership and generate alternative possibilities for public engagement.

These interventions demonstrate how cross-cultural pedagogies combining material thinking, embodied learning and performative practice can generate transformative educational experiences. By emphasising process over product and relationships over objects, they offer alternatives to conventional education, preparing students to co-create sustainable futures through collaborative sense-making and an active engagement with uncertainty.

Keywords: cross-cultural pedagogy, situated practice, transformative learning, performative architecture, material thinking, relational design

Introduction

CRAC — Crosscultural Research on Architecture Collective is a group of scholars, architects and artists engaged with the complex relations—between modernisation and tradition and between the local, regional and global—places embody. CRAC formed through shared experience. All members of CRAC were, at some point in their careers, responsible for creating educational frameworks for students in a Sino-British architecture design programme in Suzhou, China. The context demanded a radical reconfiguration of education and engendered an experimental practice of co-learning. CRAC members have collaborated on workshops, presentations and publications. Developing a platform for situated practices in the pursuit of sustainability and addressing what the *No Limits to Learning* refers to as the "human gap," our work critically examines ontological perspectives prevalent in Western architectural discourses, which emphasise boundaries, static forms and technological fixes. Building on local thought and traditions, such as relational approaches in Chinese philosophy and Scandinavian culture; contemporary systemic design; decolonial and feminist theories, with a focus on transformative action as developed by Paolo Freire, Augusto Boal, Donella Meadows and Donna Haraway, our practices, tools and methods shift attention to learning as performative and material experiences grounded in everyday processes of living. The influence of Augusto Boal's (1974/2008) transformation through performance and Paolo Freire's (1970/2000) learning through existential experience is as apparent in our

work as are the "string figures" of Donna Haraway's (2016) "thinking with," which honour Donella Meadows's guidelines for "living in a world of systems" (2008, pp. 173 ff.) and re-emphasise the need for "expand[ing] the boundary of caring" (p. 190).

We have developed cross-cultural tools that reflect Chinese and Western spatial practices, examining, for example, how classical Chinese gardens and courtyards manifest zoetological (life-centred) relationships (Ames, 2023; Berstrand et al., 2021). These tools enable situated spatial thinking that affirms openness to emerging futures rather than prescribing predetermined outcomes, reflecting Margaret Mead's (1942) insight that we cannot conceive of futures as fixed utopias without risking absolutist control (pp. 66–68). Following Gregory Bateson (1942), we locate value in the means themselves — finding worth "implicit in and simultaneous with the act itself" (p. 82), not separate from it.

A cross-cultural and meta-reflective platform, CRAC embeds an affirmative approach that moves beyond purely critical frameworks, embracing what philosopher Adriana Cavarero describes as an "imaginary of hope" (Cavarero & Roncalli, 2022) that is both transformative and generative. Speculative gestures become real-time interventions in the social fabric of communities and initiate through spatial-material transformation open futures that are projected affirmatively. Interventions in the past have included public art installations, workshops and performances, initiating the reconfiguration of relationships in communities in need and architectural education. The case studies fit with a long tradition of feminist architectural practices that appropriate and challenge place through performance. Examples include the practice by the Taking Place collective (Hoskyns & Thomas, 2017), whose founding member Teresa Hoskyns is also a CRAC member. The literal act of *taking a place* through performing spaces differently, opens an opportunity to rethink some of the often-unnoticed patriarchal norms of our spaces and institutions, and actively creates an alternative spatial and social reality within them.

Case studies discussed below include "A hat for three at a picnic" (2012–2019), a TEXTILE-lab (2023–present) and SKIRTs (2025) as sites for critical-affirmative constructions of place. The following sections reflect on the projects' inherent onto-epistemological models and their relevance for transformative learning aligned with the No Limits to Hope vision:

- Learning to participate and participating to learn: Participants negotiate conflicting needs through collaborative material exploration, moving beyond individual problem-solving towards collective sense-making.
- Affirming open futures: Participants imagine and design for social dynamics

they cannot fully predict, developing capacities for engaging with uncertainty.

- Acting to discover: At the threshold of architecture, performance and social interaction, participants experience learning as dynamic, embodied and materially grounded rather than abstractly conceptual.
- Engendering cross-cultural encounters: The case studies weave together Western architectural education traditions with local Scandinavian and Eastern relational thinking, demonstrating how cross-cultural pedagogies can generate new possibilities for learning.

A hat for three at a picnic

Re-thinking the built environment through an architectural device

Developed for first-year students of the architecture programme at Xi'an Jiaotong-Liverpool University, a Sino-British university located in Suzhou, China, the exercise "a hat for three at a picnic" fosters situated practice through a design-through-role-play activity. Building on Gordon Pask's (1976) *Conversation Theory* and related developments of design cybernetics by Ranulph Glanville (2007), the exercise exemplifies a conversational approach to pedagogy. Claudia Westermann of CRAC developed the exercise in 2012 as a playful introduction to critical and embodied spatial practice and cross-cultural understanding. A hat for three at a picnic was taught in slight variations by CRAC members and others between 2012 and 2019 as part of the introductory module ARC101, which had between 120 and 220 students enrolled in these years. As of 2026, the exercise is being adapted and expanded in collaboration with Aboriginal scholars for first-year architecture students at Curtin University in Perth, Australia. It could easily be adapted for young adults in other cultural and educational contexts. Participants do not need to be architectural design students. The exercise, at a minimum, requires approximately four days of collaborative work and one day dedicated to the final picnic event.

Relational architecture

Architecture is commonly understood to have its roots in the primitive hut, which suggests that the basic concept of architecture is *a roof over walls* sheltering from climatic conditions that are experienced as adverse. A hat for three at a picnic challenges this interpretation and introduces a more dynamic and systemic view of how architecture is part of our acting in and with worlds. The exercise guides students towards an understanding of architecture as a social technology, moderating relationships and doing so dynamically — between people of different characters,

desires, worldviews and experiences, in public and private life. Good architecture, the exercise suggests, provides frameworks for living meaningfully at all ages and — ideally — in every possible situation.

A picnic: our site, an event, a situation

The exercise brief sets a picnic situation as a dynamic site. In the context of the Sino-British architecture programme located in China, the picnic served not only as a first design exercise but also as an introduction to cross-cultural understanding via short, often amusing, excerpts from British literature and cinema that narrate picnic events. The students were encouraged to find similar stories from Chinese culture, of which there are many, as there is a long history of "spring outings" (春游 chūnyóu) also referred to as "stepping on the green" (踏青 tàqīng), which go back to the Wei and Jin Dynasties (220–420 CE) if not earlier (Tan, 2020). Picnics are also known to stage transcultural objects. Chinese lacquerware, for example, was famously exported to become an essential part of picnic baskets in Japan (*A picnic party*, early 17th century). While different cultures produce different stories, across cultures picnics have lacked in architectural moderation, and — as literature, cinema and painting tell us — often dramatically so. Picnics often bring people together with diverse worldviews and no common interests. Exposure to "other" nature and people, without any moderating framework in the form of architecture, can be a complex challenge. The brief for "A hat for three at a picnic" suggests that picnic dramas could be avoided if picnics were architecturally moderated.

"A hat for three at a picnic" posits a seemingly simple yet complex challenge: design a wearable architectural device for three picnic participants — "a common hat" — that moderates their relations. Students work in groups of six, designing for specific combinations of three characters inspired by literature (Westermann, 2012). On one picnic blanket, the following three characters gather: "a school teacher who needs a holiday, a merchant who likes to tell jokes, and a chess player fully equipped with all the chess pieces but no board." Another picnic blanket is shared by "a biologist with a research focus on insects, a philosopher who likes to watch the sky, and a musician who does not care — neither for the sky nor the insects." Yet another picnic blanket hosts "a butterfly collector, an animal activist, and someone who wished it started to rain." By focusing on social dynamics that resist easy resolution, the exercise demands design projects that go beyond technological fixes and predetermined outcomes. Instead, the students are challenged to conceive designs for living relationships that affirm openness to emerging futures.

Material thinking and embodied learning

Working with everyday and recyclable materials — chopsticks, cardboard, rubber bands, wire and cord — the students design dynamic wearables that demand — within the very process — care for the quality of relations the design makes possible. The students learn that these qualities create living stories.

The exercise culminates in a picnic event during which the students perform their designs (Figure 1) (Xi'an Jiaotong-Liverpool University, 2016). Mapping the dynamic relations between the characters at the picnic event, and encouraged to explore the limits of their design, the students' reflective folios show the development of a spatial awareness as a way of relating (Figure 2) (Westermann, 2017).



Figure 1: A group of students performing their hat at the picnic event. Photographer: Claudia Westermann, 2016.

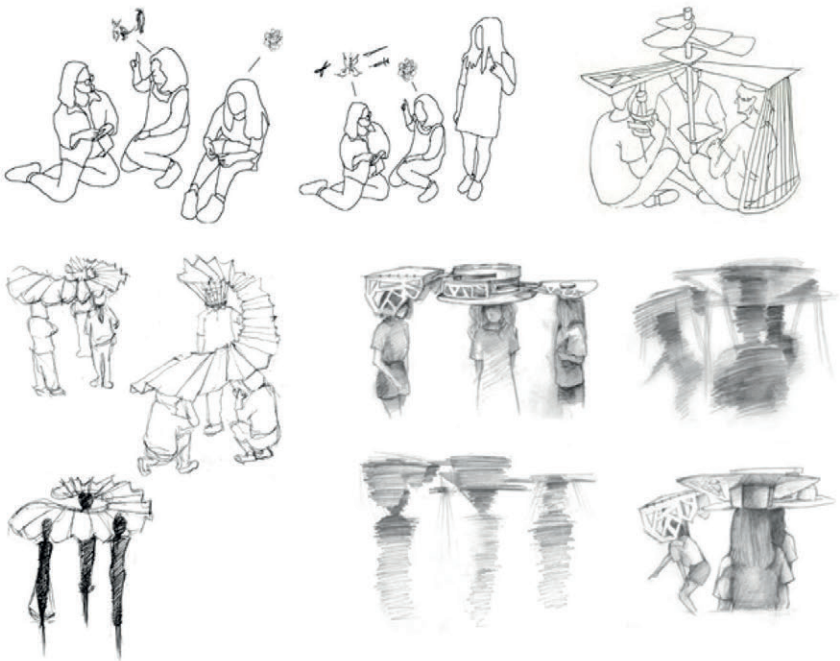


Figure 2: Reflective drawings of the design process and the hats in action at the picnic by Di Yang, Chen Danhua, Kong Lingsen and Zhao Anqi (Westermann, 2017)

"A hat for three at a picnic" embodies critical spatial practice as relational experience. A student described the learning experience in the following way: "When people move, the appearance of [the] hat changes and the space changes. When the shape of the hat changes, the people will have a different feeling of space. Therefore, the hat and [the] wearers influence each other" (Kong, 2016).

Implications for the Design of Transformative Education

"A hat for three at a picnic" relies on a pedagogical approach that makes productive use of human pre-reflective and pre-verbal capacities for acting in and with environments that are agentive and changing. If carefully framed, such acting and the related existential experiences can be a valuable source for developing new understandings, practices and vocabularies. Creating conditions in which learning emerges through role-play and conversations with imagined and beyond-imagined agents, "A hat for three at a picnic" assists in developing practices that are dynamic and affirmative of open futures.

TEXTILE-lab

A platform for cross-cultural exchanges, material co-creation and peer learning

TEXTILE-lab is a newly established workspace at the Norwegian University of Science and Technology (NTNU), Norway. At the Faculty of Architecture and Design, the space is part of a family of laboratories for spatial-material experimentation that also includes the FORM-lab and the SPACE-lab. TEXTILE-lab facilitates experiments with analogue crafts of various kinds related to the production of yarn and fibres, including weaving, felting and sewing by hand or machine. It has been initiated by members of the academic group FORM, led by Tordis Berstrand of CRAC, and invites experimental practices expanding the field of possibilities for material thinking and making in the setting of architectural education.

Historically, textile crafts and materials have played a significant role in the construction of living spaces and settlements around the world. Some of these crafts and techniques have survived despite the development of modern technologies, which were invented to rationalise the laborious processes of analogue textile fabrication. In Norway, significant traditions of wool production, yarn-making and textile crafts continue to thrive at the heart of local cultures, and renewed attention to affirmative preservation, revitalisation and transformation of such knowledges and skills informs the establishment of the TEXTILE-lab at NTNU.

A range of workshops held in relation to courses taught in the school of architecture provide the pedagogical basis for the lab as a transformative teaching and learning facility. The exploration of textiles in relation to architecture is not new but has more recently involved digital fabrication rather than traditional analogue crafts. At NTNU, the work of textile artist Anni Albers, who in the early 20th century explored correlations between architecture and weaving at the German Bauhaus school, is an inspiration. Albers saw weaving as the basis for developing new forms of practice of a transdisciplinary scope due to the "ever-extending relationships" that weaving initiates (Albers, 1974, p. 15). Such transdisciplinarity is central to working in the TEXTILE-lab, where disciplinary as well as other potential thresholds are challenged and crossed in the search for new knowledges and skills.

Overcoming potentially troublesome encounters also involves experiences of threshold moments in the learning process, during which fundamental frameworks of understanding are challenged and reconstructed. As Braaten & Hokstad (2017) argue, transformative-learning processes are central in design studies, and working in the TEXTILE-lab increases the challenge when students engage with potentially unfamiliar technologies in the attempt to creatively solve complex problems. The

onto-epistemological shifts that such challenges encourage are an important part of the learning that the laboratory facilitates.

As a meeting place, the TEXTILE-lab works as a relational device, a large loom, bringing together diverse people, cultures and knowledges. Textile materials and crafts resonate across cultures, so that everyone who enters the room soon finds themselves engaged in the exchange of memories and stories about crafts that they know. Comforted by the soft tectonics of the textile space, the potential of the subject matter is such that a community-building agency is triggered almost immediately. This effect extends beyond the laboratory itself, as experienced in recent presentations of the work outside the actual space. As a platform for situated relational practices of multiple kinds, textile craft workshops can thus be a vehicle for inclusive forms of co-learning, discovery and innovation, regardless of where they take place. As such, they can be based in a dedicated space or take the form of travelling workshops. What they teach us are skills of a transferable nature, for use in design processes and beyond.

In the 2025 spring semester, 16 international students enrolled in the design track entitled "Circular Studio — Experimental Practice" developed textile-based wearable architectures that started from wool and weaving experiments in the lab (Figure 3). The studio was developed by Aleksandra Raonic of CRAC, who was assisted by Tordis Berstrand, with textile artist Edith Lundebrekke and architect/wool expert Eileen Garman Johnsen leading the initial craft workshops (Figure 4). Here, the students acquired skills in sorting, carding and spinning raw wool, which served as material for subsequent individual and collaborative weaving experiments. The complexity of the required work increased proportionally to the scale of collaboration, level of enquiry and choice of material. Eventually, as part of the course's exploration of soft tectonics for a circular architectural practice, the students produced a 20-metre-long collaborative piece (Figures 5 and 10).



Figure 3: Wool workshop with Eileen Garman Johnsen. Photographer: Tordis Berstrand, 2025.



Figure 4: Weaving workshop with Edith Lundebrekke. Photographer: Tordis Berstrand, 2025.

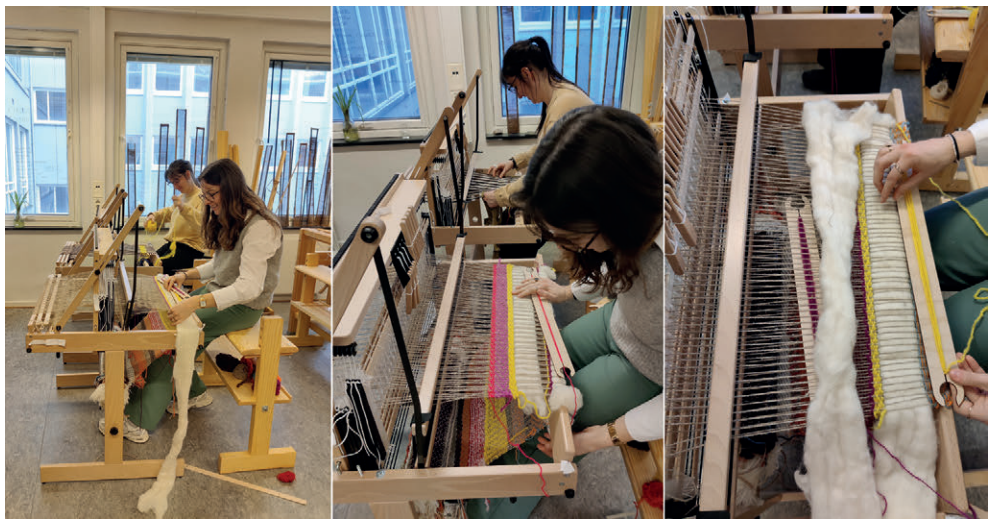


Figure 5: Companion weaving in TEXTILE-lab. Photographers: Students from the Experimental Practice cohort 2025.

One of the five groups of students reflected on the experience in the following way:

"The tapestry we made commonly in class on the looms became a main element in our concept. What we made in common is maybe the greatest piece in the work. It is a landscape of all of our bodies and experiences with the looms, and it carries the stories, for many of the members of the class, of their own way of weaving, of their first meeting with textiles and of tapestry making. This becomes visible in the many different colours, even small mistakes, and the different ways of weaving throughout the piece." (Lugaz et al., 2025)

The nature of textile creation is such that working in the TEXTILE-lab not only develops the ability to work with textile materials but also cultivates skills to engage in complex situations and narratives in which multiple choices and outcomes, loose ends and frayed edges must be carefully negotiated and woven together. Through such work, the fabric of future sustainable worlds might be constructed.

SKIRTs: appropriating public space

As part of the Circular Studio — Experimental Practice design track at NTNU, in the spring semester of 2025, students developed wearable soft architectures that embody feminist and ecological approaches to spatial design — *SKIRTs*.

How can wearable, performative architectures activate public space and propose new forms of spatial practice grounded in care, reuse and environmental ethics? This question is raised through collaborative making, material experimentation and the public performance of the *SKIRTs*. Students explore architecture as a form of event and engagement, emphasising care, circularity and inclusion. Performance, as pointed out by Taking Place member Helen Stratford (2021), is both research method — a practice — and research methodology and is a way of thinking about/through the place qualities of public space. Introduced as a pedagogic method by Aleksandra Raonic of CRAC, there are two performative forms: *ArchiCarnival*, a mobile archi-procession in the city, and *ArchiTheater*, a space-making event unfolding in public spaces (Figures 6 to 10).



Figure 6: SKIRTs Carnival about to start in front of the main university building, Gløshaugen campus, NTNU. Photographer: Milan Ognjanovic, 2025.

SKIRTs Carnival — students wear and carry their *SKIRTs*, collectively (Figures 6 and 7). They take their *SKIRTs* for a walk around the city, evoking an odd carnival-like formation, activating the streets, arousing curiosity and inviting movement that

citizens may choose to follow. They end their journey at a public space, a specific point in the city that is contextualised by the names of two women whose actions have inspired their *SKIRTs*. The public space is a square named after Elsa Laula Renberg, a Sami woman activist who fought for the rights of the Sami and organised the first Sami Assembly in 1917 (Aall & Nordli, 2016), located in front of Kjøpmannsgata Ung Kunst (KUK), as part of the Hannah Ryggen Triennial 2025: Mater (Figures 9 and 10). The Triennial celebrates the legacy of Hannah Ryggen, whose politically engaged textile practice, feminist stance and resistance to social injustice (Paasche, 2019) formed a central point of departure for the SKIRTs project and the students' material, spatial and performative investigations.



Figure 7: SKIRTs Carnival, through the city, along Nidelva, Trondheim. Photographer: Milan Ognjanovic, 2025.

When has life shifted into performance? Did it emerge while roaming the streets (Figures 7 and 8)? Students begin erecting their architectures together with wood and wool (Figure 9). They tie the knots, pull the ropes, unroll the woven and stitched fabric, while this strange construction site theatrically unfolds. Citizens approach, touch and enter the space, which is in a continuous state of flux, never fully delineated and free for anyone to join.



Figure 8: SKIRTs Carnival, through the city, along Nidelva, Trondheim. Photographer: Milan Ognjanovic, 2025.

Through a non-standardised temporal installation and the use of masks, where speculative thoughts and worlds have been intertwined both in the making and in the performance, acceptable tastes and aesthetics, as well as methods for investigation in architecture, have been challenged. We have researched how public spaces are performed and how performance-based participatory methods influence public space. Which prejudices do we have towards our environments, in the intersection of spaces and their social, cultural, economic and political relations (Lugaz et al., 2025)?

This unexpected, soft-yet-resilient architectural formation — a choreographed feminist camp — is populated by Triennial visitors and random citizens. What is being formed? The act of participatory architectural performance invites questions. *SKIRTs* become a form of union, a safe space, a place of inclusion and care. Everyone is free to raise *SKIRTs*.

As noted by Bernard Tschumi (1996), architecture challenges the idea of fixed situations, when working towards architecture as a tool for questioning social structures and revising them.

The theme of the Triennial is *mater*, which means both "mother" and "material," and refers to mother as a caring and nurturing entity and to mother nature, our collective mother. *SKIRTs* respond to this call by inviting everyone to come under *mother's skirt*. *SKIRTs* are made upon the bodies of architects and different kinds of bodies, all kinds of bodies. In the public space, they indeed live up to being SKIRTs of inclusion, calling for ecological and political justice.



Figure 9: SKIRTs performance, a participatory architectural event with students and citizens erecting the SKIRTs on Elsa Laula Renberg Square. Photographer: Milan Ognjanovic, 2025.

The *SKIRTs* are gone, and the square is empty again. What happens to the square after the *SKIRTs* have walked away? Perhaps it ceases to exist, awaiting to be activated and awakened by another. Perhaps the square, as a form of sharing, an idea, a dialogue, a co-created architectural reality, extends infinitely through the experience of whoever was there taking part.

The *ArchiTheater* method frames architecture as an event, a moment of togetherness, of sharing space in the making, in knitting, holding, erecting, falling, dancing with, weaving, pulling, or just being together under, in between, within fibres and garments of the *SKIRTs*. *SKIRTs*, as a participatory architectural event, are internalised. This idea is carried further in the hearts, minds and bodies of *SKIRTs*' owners — if owning is participating in creating, rather than purchasing for monetary value and objectifying.

Who owns the public space? What constitutes the public space? The architectural performance as a method raises these questions. It allows the public space to grow and spread infinitely, by everyone who owns the *SKIRTs*' experience — simply by moving around and being in the world.



Figure 10: After the performance, SKIRTs await to continue their journey. Photographer: Milan Ognjanovic, 2025.

Finally, the *SKIRTs* architectural performance addresses women in public space. Feminist performative architectures can generate alternative public spaces, in which one opens up O*ther* possibilities — possibilities formerly repressed, through layers of sedimented social practices and material presence (Stratford, 2021). They appropriate space simply by acknowledging that wearing a skirt is a sufficient condition to do so.

Wear a *SKIRT* and appropriate the public space.

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Building sustainable futures through higher education: the planning process of the multidisciplinary sustainability transitions study module

Niina Mykrä, Mikael Puurtinen and Anna Lehtonen*

Abstract

Interdisciplinarity is central to facing the challenges of sustainability transitions. Many faculties in different universities have adopted sustainability in their disciplinary studies as a goal in higher education. At the University of Jyväskylä, Finland, the novel Basic Multidisciplinary Studies in Sustainability Transitions study module addresses the need to integrate these diverse viewpoints to facilitate multidisciplinary development and change. In this paper, we analyse the design process of the module and the sustainability competences that emerged during that process.

The Basic Multidisciplinary Studies in Sustainability Transitions module introduces students to the needs, barriers and opportunities of sustainability transitions from a multidisciplinary perspective. The content of the studies is grounded in the three spheres of transformation framework by Karen O'Brien and Linda Sygna, and sustainability transitions are examined from practical and technical, cultural and psychological, and political and structural perspectives. The module involves all faculties of the University of Jyväskylä in its design and implementation.

The data for this case study were collected through focus group interviews and project documents. The analysis of the planning process revealed that the crucial factors behind the successful planning process of the study module were the university's decisions, plans and strategies; the cooperation of the planning group;

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and the engagement of individual planning group members. The multidisciplinary approach has proven to be fruitful.

Sustainability competences were analysed according to the structure of the European Competence Framework, GreenComp. The designers viewed sustainability as value-laden and emphasised the importance of diverse perspectives. They recognised that interdisciplinary cooperation is needed because the sustainability transition is a complex phenomenon. Dialogue on differing disciplinary interpretations was seen as essential for broadening perspectives. The designers hoped that the Basic Multidisciplinary Studies in Sustainability Transitions module would enable students to become agents of change.

Keywords: *Sustainability transition, interdisciplinarity, multidisciplinarity, higher education, sustainability competences, GreenComp*

Introduction

It is widely agreed that solving environmental and sustainability problems requires an interdisciplinary approach. This idea is not new. As early as 1979, the report *No Limits to Learning* — prepared for the Club of Rome by James W. Botkin, Mahdi Elmandjra and Mircea Malitza — emphasised that interdisciplinary perspectives are crucial for the kind of innovative learning needed to address environmental degradation. Moreover, recent research has highlighted the value of multi-, inter-, trans- or even postdisciplinary understandings of sustainability (Matlovič & Matlovičová, 2024; Saruchera, 2025; Vereijken et al., 2023). Education and, more specifically, higher education, is a focal arena for facilitating transformative change by building capacity for interdisciplinary and systems research and transforming the university education system to train potential researchers and future professionals on sustainability (O'Brien et al., 2013; Cembranel et al., 2024; de Campos Junges et al., 2024).

Many faculties across various disciplines in different universities have adopted sustainability as a goal in their disciplinary studies in higher education. At the University of Jyväskylä, Finland, the novel Basic Multidisciplinary Studies in Sustainability Transitions study module addresses the need to integrate these diverse viewpoints to facilitate multidisciplinary development and change.

This case study analyses the development process of Basic Multidisciplinary Studies in Sustainability Transitions and the sustainability competences that emerged during the process. In the following sections, we will describe the theoretical

background and methods of this study. We will answer how the planning process proceeded, what kind of content was developed and how the areas of sustainability competence were exposed in the process.

Theoretical background

The content of the Basic Multidisciplinary Studies in Sustainability Transitions study module is grounded in the three spheres of transformation framework by Karen O'Brien and Linda Sygna (O'Brien & Sygna, 2013). In the analyses of the planning process of the module, we use the areas of competence defined in the European sustainability competence framework GreenComp (European Commission [EC] & Joint Research Centre [JRC], 2022). In this section, we describe these two approaches.

Three spheres of transformation

The three spheres of transformation framework was adapted for module design from the article by Karen O'Brien and Linda Sygna (2013). This framework (Figure 1) presents a holistic view to transformation, highlighting a need for changes 1) in technologies and behaviours where impacts are observed (the practical sphere), 2) in systems and structures that define the constraints and possibilities under which practical transformations take place (the political sphere) and 3) in beliefs, values and worldviews (the cultural sphere) that shape the ways that the systems and structures are viewed and influence what types of solutions are considered possible. These spheres are interconnected and nested, meaning that effective transformation requires changes across all three. Practical solutions alone are insufficient without supportive political structures and shifts in personal values and cultures. The framework emphasises inside-out and outside-in approaches, recognising that cultural and systemic changes are as critical as technological ones.

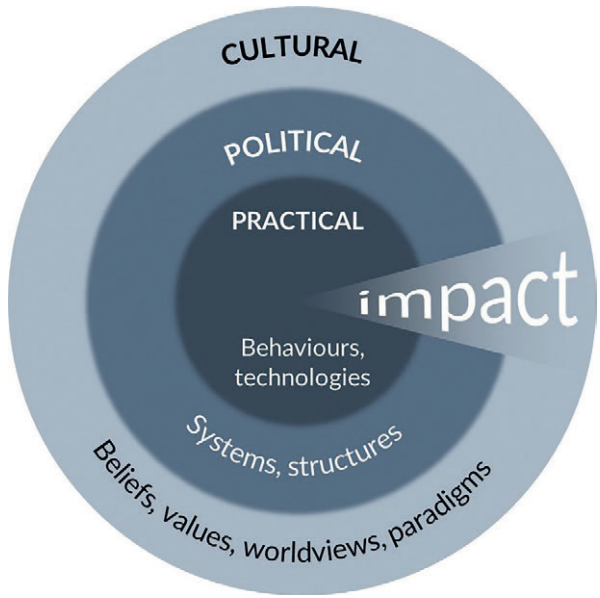


Figure 1: The three spheres of transformations. From O'Brien & Sygna (2013) with some adjustments (e.g. relabelling the outer sphere as "Cultural" instead of "Personal"). The importance of interactions between the spheres is captured with the blurred borders between the spheres and the "impact" wedge cutting across the spheres, showing the importance of cultural and political facets to lasting changes in the practical sphere.

The advantage of this framework is that it allows both lecturers and students to identify the place of their specific disciplines in sustainability transitions, thus giving everyone a "comfort zone" in this highly interdisciplinary module. While intervention points for sustainability transformation may be found within each of the spheres, it is *interactions* across the spheres where the greatest potential for generating transformation lies. Accordingly, the module courses are designed to cross-reference each other and to use practical examples that carry across the module, so that students can get a clear idea of how practical, political and cultural issues interact in efforts to promote sustainability transformations.

Sustainability competence

In this paper, we use the concept of *sustainability competence* to describe the capacity building related to the Basic Multidisciplinary Studies in Sustainability Transitions study module. In scholarly literature, there is no universally agreed-upon definition of sustainability competence (Bianchi, 2020; Vare et al., 2022). The concept of competence is controversial due to its associations with economic growth and its perceived emphasis on qualifications at the expense of broader educational aims (Biesta, 2022; Vare, 2022; Wheelahan et al., 2022). Also, the concept of sustainability has been criticised, and new concepts have been proposed, such as planetary wellbeing, which emphasises the deep interconnection between the health of human societies and the health of Earth's natural systems; the term expresses the intrinsic value of both human and nonhuman life (Kortetmäki et al., 2021). Education for planetary wellbeing means that education should be grounded in dialogue between humans and other life forms (Aaltonen et al., 2023). It goes beyond incremental change, aiming for structural shifts in thought, feeling and action. This approach rejects human superiority, promotes ethical coexistence within planetary boundaries and ultimately seeks to empower individuals and societies to make responsible choices that sustain life on Earth and foster planetary wisdom.

In this paper, we interpret the concept of sustainability competence broadly, in the spirit of the concept of planetary wellbeing.

We find that the GreenComp framework (EC & JRC, 2022), developed through a comprehensive literature review (Bianchi, 2020) and extensive consultation with experts and stakeholders, offers potential for structuring the broad domain of sustainability competences. GreenComp is a part of the European Council's policy initiatives, has been endorsed by ministers from EU member states (European Council, 2022) and is used by national education administrations. GreenComp outlines sustainability competences across four interlinked key areas: *embodying sustainability values*, including the competences of valuing sustainability, supporting fairness and promoting nature; *embracing complexity in sustainability*, including the competences of systems thinking, critical thinking and problem framing; *envisioning sustainable futures*, including of competences of futures literacy, adaptability and exploratory thinking; and *acting for sustainability*, including the competences of political agency, collective action and individual initiative. All the areas include elements of knowledge, skill and attitude.

The GreenComp focuses on individual competences, but we believe its structure also allows us to examine sustainability competences from a collective viewpoint and even from a technical-material perspective (Mykrä et al., 2025). As stated in the *No Limits to Learning* report (Botkin et al., 1979), not only individuals but also groups of people, organisations and societies can learn. The individual, collective and technical-material spheres of competence are deeply intertwined (Mykrä et al., 2025).

Methods

Data for this study were gathered through focus group interviews and project documentation. A total of 16 members from the planning team participated in one of four focus group sessions, each lasting 1.5 hours. The questions of the interviews consisted of the themes 1) the meaning of sustainability, 2) disciplinary perspectives on sustainability and 3) the multidisciplinary planning process. All interviews were recorded and transcribed for analysis.

In addition to the interviews, two written assignments served as key data sources. These tasks were designed to capture disciplinary perspectives on sustainability transitions — one focusing on general sustainability transitions (7 responses) and the other on cultural sustainability transitions (9 responses), with each response averaging one page. Altogether, the interviews and written tasks reflect the personal viewpoints of 22 planning-team members. Supplementary documents produced during the planning process were also used as secondary data sources. The first author was actively involved in the module's planning and was responsible for the data collection.

The data were analysed using theory-driven thematic analysis (Braun & Clarke, 2006), according to GreenComp structure. Themes were organised using Atlas.ti software. Within each GreenComp area, sub-themes were identified by coding key elements.

The findings are discussed in the following sections, including the planning process and analysing the sustainability competences that are emerging from the process.

The planning process and the contents of the module

The planning of the Basic Multidisciplinary Studies in Sustainability Transitions study module began in 2023 at the University of Jyväskylä. One basis for the module were the regulations in the university promoting sustainability: the strategy of the university, the curriculum reform, the environmental programme, and the agreement between the Ministry of Education and Culture and the University of Jyväskylä, which all include goals for sustainability research and studies. The University of Jyväskylä is also committed to the theses on sustainability defined by UNIFI (Council of Finnish Universities). The intellectual starting point for the course, however, is the JYU. Wisdom, an open and transdisciplinary community whose mission is to excel in the research and education of planetary wellbeing at the University of Jyväskylä.

The initiative for the study model came from JYU.Wisdom (bottom-up), and it was supported by the decisions described above (top-down). However, the first attempt to initiate the planning process of Basic Multidisciplinary Studies in Sustainability Transitions didn't succeed, as the faculties are autonomous and they were not engaged in the process. After intensive communication with the faculties, their leaders decided to appoint delegates to the planning group, which got the process moving.

All the faculties of the multidisciplinary university participated in the development of Basic Multidisciplinary Studies in Sustainability Transitions, with an emphasis on integrating disciplinary perspectives. The goal was to avoid dividing the content into separate disciplinary parts and instead integrate different components into cohesive wholes. The planning group consisted of teachers, researchers and administration, 25 people in total. In addition to regular meetings, the team held an intensive two-day planning seminar in April 2024 at the university's off-campus research station. In the seminar, the group was divided into three groups according to their interests. The module was designed around three courses that correspond to the three spheres of transformation (O'Brien & Sygna, 2013) — practical, political and cultural — which also defined the themes of the three planning groups. After the seminar, the same groups continued with the planning of the more specific goals, contents and methods of the courses. The first courses started in spring 2024, and the planning process continues with the last courses until spring 2026.

Each course around the spheres of transformation, Technological Sustainability Transitions, Cultural Sustainability Transitions and Socio-economic Sustainability Transitions, has a preparatory MOOC course. In addition to these, the study module includes an introductory course to sustainability transitions, project work on sustainability transitions and elective courses on sustainability.

Sustainability transitions are defined within the Basic Multidisciplinary Studies in Sustainability Transitions module as complex processes that require multilevel approaches combining expertise from different disciplines in order to understand and manage them. After introducing the need for sustainability transitions and the dimensions of change, the study module focuses on the key technological systems (food systems, energy systems, built environments and mobility and digitalisation) and their interactions and relations to sustainability problems and solutions. The courses on cultural sustainability transitions include the impact of worldviews, cultures and beliefs and the role of emotions in changing beliefs, values and behaviours. The courses on the socio-economic sustainability transitions focus on societal, political and economic systems and the interplay of different actors in promoting sustainability transitions. They also focus on how issues of power and conflict constantly challenge transition processes and raise questions of justice. The elective courses, according to the interests of students, and the project on sustainability transitions complete the study module, with students analysing a real-world sustainability problem and creating a sustainability transition plan using knowledge and understanding from the previous courses.

Sustainability competences in the planning process

In the following, the insights of the designers, both on the contents of Basic Multidisciplinary Studies in Sustainability Transitions and the planning process, are analysed. The structure of the GreenComp — embodying sustainability values, embracing complexity in sustainability, envisioning sustainable futures and acting for sustainability — is used to structure the analysis. The statements in this section are collected from the data, and the interpretations of the authors of this paper are left to the next section.

Embodying sustainability values: valuing sustainability, supporting fairness and promoting nature

The designers of the Basic Multidisciplinary Studies in Sustainability Transitions study module acknowledged the central role of values in advancing sustainability and aimed to help students understand the diversity of values. They did not view value neutrality as an ideal in expert practice. According to them, disciplinary practices can shape values, and in some faculties, value-related issues were regarded more as subjective opinions than as legitimate academic concerns. The designers expressed concern that students might encounter conflicts between their values and the realities of professional life. They hoped that the Basic Multidisciplinary Studies in Sustainability Transitions module would equip students with the competencies needed to engage a diverse range of stakeholders in dialogue, especially in situations involving potential value conflicts and compromises.

The designers shared a commitment to sustainability, grounded in the aspiration to live in harmony with nature. Many designers also spoke about the importance of student motivation, their willingness to engage with sustainability and the need to design courses that are both appealing and inspiring. Sustainability knowledge and understanding of natural systems were highly valued. They also emphasised the importance of democracy, fairness and considering others, including non-human entities. The designers also had differences: while some emphasised the importance of deepening understanding of the complexity of sustainability, some others favoured systemic solutions that reduce reliance on individual choices, such as advanced technological interventions or approaches from behavioural economics.

Embracing complexity in sustainability: systems thinking, critical thinking and problem framing

The Basic Multidisciplinary Studies in Sustainability Transitions designers recognised sustainability transitions as inherently complex phenomena. They agreed that interdisciplinary collaboration is essential for building a comprehensive systems understanding of sustainability and of the environmental consequences of human actions. At the same time, students need to understand how environmental challenges intersect with their own disciplines. This complexity also involves underlying, often invisible, structures, such as institutional cultures, established practices and competing priorities.

The designers also acknowledged the complexity of determining what constitutes

sustainable action in practice. They argued that students should develop the competencies needed to critically examine the prerequisites for sustainability in different contexts. Furthermore, tolerance for uncertainty is necessary when dealing with incomplete knowledge, complex dilemmas and trade-offs.

Envisioning sustainable futures: futures literacy, adaptability and exploratory thinking

A core premise of sustainability transitions is the need to safeguard the conditions necessary for the future wellbeing of both human and non-human life by developing novel approaches addressing sustainability challenges. The Basic Multidisciplinary Studies in Sustainability Transitions designers emphasised that achieving this goal requires more than incremental or marginal changes. They stressed the importance of maintaining openness to new insights, acknowledging that the transition towards sustainability will inevitably involve unexpected developments. Interdisciplinary collaboration was seen as valuable for developing innovative approaches. The designers highlighted how engaging with diverse viewpoints during the planning process helped broaden their perspectives on sustainability. The interdisciplinary collaboration brought to light certain issues that often remain in the shadows within certain fields — for example, value discussions are seldom addressed in some faculties. Differences in how certain concepts, such as behaviour, are defined also broadened understandings. Dialogue was considered essential for enabling the emergence of new perspectives.

The designers recognise that during the transition, sustainability challenges can evoke complex emotions and internal conflicts and that emotional adaptability is needed to navigate long-term change. However, when addressed in a supportive environment, both negative emotions and positive emotions, such as a sense of connection with the natural world, can serve as powerful motivators. Engaging in purposeful action for sustainability was seen as a constructive way to cope with eco-anxiety, offering a sense of agency and direction in the face of environmental concerns. Emotions are essential in driving sustainability transitions forward.

Acting for sustainability: political agency, collective action and individual initiative

The designers of Basic Multidisciplinary Studies in Sustainability Transitions valued transdisciplinary collaboration and co-creation among individuals with diverse backgrounds and perspectives, although they acknowledged that implementing transdisciplinarity in practice can be challenging. A key objective was to equip students with the ability to navigate multiple discourses and to find their role in advocating for sustainability within their future professional contexts. The planning group emphasised the importance of allowing sufficient time to deepen both personal and collective understanding.

The designers discussed that policy instruments, regulatory frameworks, market design and behavioural nudging can guide action towards sustainability. During the planning process, the guiding role of the university policies and administration became explicit, particularly in discussions about the allocation of potential resources and academic credits among faculties. These discussions revealed underlying tensions as the administration defended the interests of the institution as they saw it. Despite these challenges, the skilful facilitation from the leaders of the process, the shared commitment of the designers and the personal effort made by everyone to reallocate time from other responsibilities, supported the module's development.

The designers aimed to support students in becoming agents of change. They agreed that this is not acquired solely through factual learning or dialogue, but also through practical experiences and learning from others, which foster deeper and more personal understanding. The designers expressed a desire for Basic Multidisciplinary Studies in Sustainability Transitions to provide students with similarly enriching experiences to those they had during the planning process, and to continue learning alongside students during the courses.

Discussion and conclusions

In this paper, we have studied the planning process of the Basic Multidisciplinary Studies in Sustainability Transitions study module at University of Jyväskylä, Finland. We described the phases of the planning process and the contents of Basic Multidisciplinary Studies in Sustainability Transitions, grounded on the three spheres of transformation framework (O'Brien & Sygna, 2013), and analysed the competences exposed in the process by the designers of the module, structured with GreenComp (EC & JRC, 2022). We found that the university's plans and strategies and the cooperation between universities in promoting sustainability constituted the

necessary but not sufficient preconditions for initiating the planning of the study module. The transdisciplinary JYU.Wisdom community, promoting planetary wellbeing, had a crucial role in establishing the planning group for the module. Without the cooperation between the faculties and administration, the engaged designers, and skilled facilitators leading the process, it wouldn't have been possible to realise the study module.

During the planning process, all the competence areas of the GreenComp framework were discussed, which implies that the GreenComp framework presents relevant perspectives for sustainability education and competences required for sustainability transformations. It is worth noting that many of the competences the designers considered important were connected to social skills and values, such as the ability to cooperate and to advance sustainability efforts despite differing worldviews. The designers also recognised sustainability transitions as complex processes shaped by institutional structures, which highlights the need for students to develop critical and systemic thinking. Abilities such as cooperation or critical thinking cannot be evaluated through simple tests. Although the designers were experts in sustainability within their own fields, they still felt that they learnt a great deal during the planning process. Flexibility and a continuous willingness to develop are essential in the design of sustainability studies. GreenComp addresses these issues, but greater emphasis should be placed on the structural level and processes than the GreenComp framework currently recommends.

The findings suggest that sustainability competence is not a final state to be achieved at a certain point, but rather an ongoing effort within a changing environment. Individuals influence their context, and the context, in turn, influences individuals; structures should therefore be taken into account. These findings challenge the traditional idea of competences as a standardised qualification or collection of knowledge, skills and attitudes that individuals simply possess. This confirms the thinking of Gert Biesta (2022), who strongly criticises how modern education tends to overemphasise qualification at the expense of the other purposes, becoming part of traditions and communities (socialisation) and becoming an autonomous, responsible subject (subjectification).

As Aurelio Peccei (1979) writes in the foreword of the *No Limits for Learning* report, it is not an easy job to blend various approaches and opinions, but blending is itself an experiment in learning. This is how the designers of Basic Multidisciplinary Studies in Sustainability Transitions experienced the discussions in the planning group. This learning experience proves that multi- and interdisciplinarity create innovations needed for sustainability transitions, constructing new alternatives that

didn't exist before (Botkin et al, 1979).

"Changes in educational systems come slowly," write Botkin, Elmandjra and Malitza (1979, p. 68). One of the designers of Basic Multidisciplinary Studies in Sustainability Transitions confirmed this by saying: "Slowness is a feature, not a flaw, of the process." We are now implementing ideas written over 45 years ago. Still, the cooperation between disciplines is challenged by different values and practices; the university's administrative structures are poorly suited for interfaculty collaboration; and negotiations are needed.

The world now is different from the world in 1979 when *No Limits for Learning* was written. It is evident to most people, from their own experience, that biodiversity has declined and the climate has changed. The general understanding of planetary wellbeing has widened, and humans are understood as part and not as masters of the natural world. The basics of environmental changes are included in curricula all around the world.

There is still a job to be done, though. During the planning process, the three spheres of transformation framework provided disciplinary "comfort zones" that helped avoid endless discussions about concepts and differing interpretations of sustainability. Even the name of the study module is a compromise, designed to engage a broad audience. Terms like "interdisciplinary," "transdisciplinary" or "sustainability transformation" could have been considered too radical, preventing the adoption of the module. The next step is to create new kinds of connections and foster inter- and transdisciplinary approaches between disciplines.

This case study holds hope: At universities, there are possibilities to enhance interdisciplinary studies, and many people are engaged in sustainability, prepared to commit themselves and to prioritise common goals for sustainability transitions.

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Reimagining sustainability education: a justice-oriented and decolonial approach through project-based learning

*María Angélica Mejía-Cáceres**

Abstract

This paper explores the transformative potential of critical environmental education by integrating decolonial perspectives and intercultural knowledge exchanges between high-income and low-and middle-income countries. Grounded in the framework of No Limits to Hope, this approach seeks to cultivate inclusive, justice-driven sustainability education that challenges dominant paradigms. We present a case study of a master's-level sustainability course, implemented over two semesters with 23 interdisciplinary, multicultural students. Central to the course is project-based learning, which fosters critical thinking, creativity and educational innovation. Data were drawn from five student-led sustainability projects that addressed themes such as digital equity, green-skills job alignment, cultural resilience, health and wellbeing, and the emotional dimensions of climate communication. Using Fairclough's critical discourse analysis framework, focusing on intertextuality, interdiscursivity, presuppositions and dialectical pairs, we examined how students' discursive practices reflected, reproduced or resisted dominant epistemologies. Findings indicate that combining critical environmental education, decolonial pedagogy and project-based learning promotes a more inclusive, justice-centred approach, deepening students' engagement with complex sustainability challenges. Building on these insights, we propose six pedagogical strategies, from "cartographies of territory" to "collaborative prototyping labs", designed to move from symbolic inclusion to epistemic centrality,

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fostering intellectual emancipation and transformative learning in sustainability education.

Keywords: critical environmental education, decolonial pedagogy, project-based learning, critical discourse analysis, sustainability education.

Introduction

In the face of converging global crises and deeply rooted inequalities, the need to reimagine sustainability education has never been more urgent. This contribution responds directly to the renewed call posed by The Fifth Element programme of the Club of Rome and the WEEC Network to update and deepen the seminal insights of *No Limits to Learning* (Botkin et al., 1979), through the lens of transformative and innovative learning models capable of "bridging the human gap."

In this context, this paper presents a case study drawn from a master's-level sustainability course that was redesigned to integrate critical environmental education, decolonial pedagogy and project-based learning. The redesign responds to the urgent need to develop educational spaces that not only transmit knowledge but also empower learners to act within multicultural and polycrisis contexts, fostering ethical engagement, empathy and transformative hope (Freire, 2020; Mejía-Cáceres et al., 2024).

Central to this initiative is the conviction that hope is pedagogical and political; it is not a passive sentiment but a commitment to nurturing learners' agency to imagine and co-create alternative futures, especially in times of uncertainty and crisis (Freire, 2016). The course reconfiguration was guided by the recognition that previous formats, while strong in scientific content, suffered from a Eurocentric bias and lacked tools to integrate cultural diversity and critical reflection, particularly in navigating "North–South dialogues" and "epistemological asymmetries" (Galvin, 2009; Maniglio & Barboza da Silva, 2021).

The new design leverages project-based learning as a participatory, learner-centred methodology that enables students to grapple with real-world sustainability challenges across intercultural and interdisciplinary boundaries (Pasquinelli et al., 2021). Project-based learning's iterative structure provides fertile ground for integrating diverse knowledge systems and developing collaborative problem-solving skills, key to bridging the "human gap" identified by *No Limits to Learning*.

However, integrating decolonial perspectives into formal curricula presents notable challenges. As the literature on critical environmental education reveals,

existing educational structures often reproduce dominant discourses and marginalise Southern or Indigenous epistemologies (Fairclough, 2011; van Dijk & Perales, 2008). The course thus undertook a critical examination of these gaps, highlighting the need for curricular designs that resist extractives logics and epistemic silencing. While initial integration of these perspectives proved difficult, especially within institutional frameworks shaped by accreditation, assessment and scalability, student projects demonstrated that transformative discourse could emerge through careful scaffolding, critical pedagogy and emotional engagement.

Through this case, we explore how reimagining the university classroom as a dialogic and justice-oriented space, rooted in complexity, relationality and ethical imagination, can support the goals of No Limits to Hope and provide actionable insights for advancing transformative sustainability education across global contexts.

Guiding principles of the proposal and their articulation with *No Limits to Learning*, the debate on transformative learning and the decolonial perspective

The pedagogical proposal presented here is grounded in the principles formulated by Mejía-Cáceres and Zambrano (2018), which, although not explicitly framed as decolonial, offer a fertile foundation for an interpretation that challenges epistemic hierarchies imposed by Western modernity and promotes cognitive justice. In this way, these principles contribute to updating the core insights of the *No Limits to Learning* (1979) report and align with the contemporary debate - The Fifth Element programme of the Club of Rome and the WEEC Network - on the urgency of inclusive, situated and transformative learning capable of bridging the human gap between knowledge, action and meaning.

1. Recognition of the self, the other and the oikos[1]

through environmental ethics and aesthetic sensibility. This principle emphasises the subject as a relational, emotional and ethical being, promoting ecological and affective awareness through sensitive languages such as poetry and aesthetics. In a decolonial key, it challenges the modern notion of the rational, individualistic and detached subject, proposing instead a view of the human being as part of an

1 Following Noguera (2004), oikos is understood as the shared dwelling of life, understood not as a physical place but as a relational mode of inhabiting the Earth. It embodies an environmental ethic grounded in interdependence, care, and poetic dwelling, challenging dualistic conceptions that separate humans from the more-than-human world.

interdependent web of life. This resonates with *No Limits to Learning*'s call to cultivate new ways of perceiving and to reconfigure the relationship between knowledge, sensitivity and transformative action.

2. Recognition of territory based on the theory of place.

The understanding of territory as a lived, symbolic and affective space, proposed by Mejía-Cáceres and Zambrano, aligns with decolonial pedagogical principles by questioning the homogenisation of spaces and the imposition of abstract development logics. Recognising place also means recognising memories, languages and knowledges that have been historically silenced. This principle rebuilds the bond between identity and space through an ethics of care, rootedness and belonging, key pillars for bridging the gap between global discourses and local realities.

3. Enhancement of diverse types of knowledge through the dialogue between them.

This is the principle in which the decolonial dimension is most clearly expressed. While Mejía-Cáceres and Zambrano do not explicitly use this term, the dialogue of knowledges between the high-income and low-and middle-income countries proposed here challenges modern epistemic hierarchies and affirms the legitimacy of Indigenous, popular, local and non-academic knowledges. This approach aligns with the "epistemologies of the South" proposed by authors such as Boaventura de Sousa Santos (2014), particularly his emphasis on cognitive justice and the recognition of multiple forms of knowledge. It also resonates with *No Limits to Learning*'s critique of linear thinking. Promoting such dialogue not only democratises knowledge but also actively contributes to bridging the human gap through recognition and redistribution of knowledge.

4. Connecting identity, culture and nature through symbols.

By centring learning on the symbolic and cultural dimension of human beings, this principle opens the space to reconstruct decolonised subjectivities and ways of inhabiting that reconnect identity, memory and territory. Recovering symbols as pedagogical language is also a way to resist abstract narratives that claim universality that have fractured the relationship between people and their environments. In this sense, it supports the reconfiguration of transformative education that not only transmits content but also reorients the meaning of collective existence through an ethics of plurality and justice.

Together, these principles create the conditions for a situated, relational and hopeful form of learning that questions dominant knowledge structures and allows

for the imagining of plural futures from multiple worldviews and territories. They are, therefore, a concrete contribution to the expanded vision of the No Limits to Hope initiative, offering pedagogical tools to bridge the human gap through a deeply ethical, aesthetic and decolonial educational praxis.

Methodological exploration in sustainability and environmental education

Course redesign: towards a critical and plural sustainability pedagogy

The course, formerly Exploring Sustainability, was developed for the interdisciplinary master's programme at Université Paris Cité and the Learning Planet Institute for the 2024–2025 cohort. Originally one semester long and biologically centred, it focused on climate science, biodiversity and systems modelling, providing foundational technical knowledge.

The redesigned course based on students feedback, extends to two semesters, preserving analytical rigor while embedding scientific topics within holistic, justice-oriented and context-sensitive frameworks. Core themes such as climate disruption, resource extraction and complex systems modelling remain central but are reframed through socio-environmental, cultural and post-development lenses. The new structure broadens the scope of sustainability learning by bringing together environmental, social, cultural and political dimensions, engaging with a range of challenges reflected across the Sustainable Development Goals (SDGs) while encouraging students to critically examine the relationships and tensions between them. It integrates interdisciplinary, affective and emancipatory approaches, preparing students to engage critically with sustainability challenges in real-world contexts.

Key changes in the curriculum

Maintained and transformed elements:

- Understanding the Anthropocene remains a core unit, now delivered as an interactive dialogue through a critical lens.
- Systemic methods retained and applied through project-based learning cycles allow students to apply complex systems thinking in real-world contexts.
  Climate change, biodiversity and resource dynamics continue as foundational themes, now examined through social justice, governance and global

inequalities.

Newly introduced themes:

- Human, culture and environment: Explores the interconnectedness between cultural systems and ecological dynamics.
- Critical perspectives: Introduces frameworks such as hegemony, utopia and resistance in environmental discourses.
- Socio-environmental justice: Addresses power relations, vulnerabilities and inequalities in the Anthropocene.
- Gender equality, peace and justice: Examines how gender, power, conflict and social inequalities shape socio-environmental challenges and possibilities for transformation.
- Post-development and alternative futures: Challenges dominant growth paradigms through pluriversal and decolonial thinking.
- Emotional engagement: Falling in Love with a Socio-environmental Problem invites students to identify a socio-environmental challenge that is meaningful and connected to their own interests, experiences or contexts. This process helps them develop a personal and ethical connection to the issue and provides a possible starting point for the project they may choose to develop later in the course.

Pedagogical innovation integrates longitudinal project development supported by mentoring, cross-institutional collaboration (e.g. Arizona State University) and varied assessment methods including literature reviews and oral presentations.

A shift towards critical sustainability education

To illustrate the pedagogical and epistemological transformation of the Exploring Sustainability course, Table 1 provides a comparative overview of the previous and redesigned versions, focusing on key changes in content, structure, methodology and educational objectives. Expanding from one to two semesters, the redesign integrates interdisciplinary, affective and emancipatory dimensions of sustainability learning. It aligns with current debates in environmental education and the United Nations's Sustainable Development Goals (SDGs), emphasising social justice, decolonial perspectives and transformative student engagement.

Table 1. Comparative overview of the sustainability course redesign

Category	Previous course (1 semester)	Redesigned course (2 semesters)
Duration	1 semester	2 semesters
Pedagogical focus	Technical-scientific; disciplinary knowledge	Critical, holistic, plural; research-based and decolonial
Epistemological orientation	Predominantly Eurocentric; positivist science	Pluriversal; integrates local, Indigenous and affective knowledge
Core themes	Epistemology, climate change, biodiversity, resource extraction, systems modelling	Human-nature relations, socio-environmental justice, gender, post-development, affective engagement, climate change, biodiversity, system thinking
Methodologies emphasised	Multidisciplinary, scientific debate	Participatory research, narrative inquiry, critical pedagogy, creative problem formulation
Justice & equity content	Addressed in isolated modules (e.g. migration, inequalities)	Scaffolded across two semesters with mentor guidance and cross-institutional collaboration

Category	Previous course (1 semester)	Redesigned course (2 semesters)
Student research development	Addressed in isolated modules (e.g. migration, inequalities)	Central across course; examines power, inequality, vulnerability and the uneven distribution of socio-environmental risks and resources
Key additions	N/A	"Falling in Love with a Socio-environmental Problem," post-development critiques, gender equality, affective-sensorial dimensions
Assessment methods	Conceptual maps, quiz, system modelling	Literature reviews, quizzes, group activities, oral presentations
Collaboration	Internal (within institution)	International (e.g. Arizona State University collaboration)
Theoretical foundations introduced	Cognitive science, systems theory	Critical theory, decolonial thought, environmental humanities

Who were the participants?

The 2024–2025 cohort included 23 interdisciplinary, multicultural students from Pakistan, the United States, Colombia, Russia, Brazil, Sweden, Tibet, Turkmenistan, China, South Korea, Bangladesh, Greece, Vietnam, Afghanistan, Philippines, Serbia, Montenegro and France.

Students brought diverse academic backgrounds, including biosciences, business, history, pedagogy, psychology, computing, IT, engineering, economics, public health, biotechnology, medical biochemistry, data science, pharmacology, agronomy, accounting, education, mathematics, aeronautical engineering and linguistics. This rich mix fostered a dynamic, collaborative learning environment.

Methodology

This study used Norman Fairclough's critical discourse analysis to examine how student sustainability projects reflect or resist dominant paradigms. By interrogating discourse as both a reflection of and a contributor to social realities, this approach aligns with the broader goals of critical environmental education and the course's redesign towards plural and justice-centred sustainability pedagogies.

Analytical framework

The analysis was structured around four key dimensions of discourse proposed by Fairclough:

1. **Intertextuality**: examining the external voices, references and authoritative sources the texts draw upon.
2. **Interdiscursivity**: identifying how different discursive fields (e.g. science, education, economics, policy, health, culture) are blended.
3. **Presupposition:** revealing implicit assumptions, taken-for-granted truths and embedded ideologies within the discourse.
4. **Dialectical pairs:** analysing oppositional structures that underpin meaning-making, such as new/old, modern/traditional, data/experience.

Data source

The dataset comprised five student-led sustainability projects addressing topics such as digital equity in education, alignment between green skills and jobs, cultural resilience, gut health and mental wellbeing and the emotional dimensions of climate communication. Each project included a written report, often supplemented with multimedia components such as podcasts, visual media or prototypes. The projects were produced through a two-semester course emphasising project-based learning, decolonial pedagogy and critical sustainability education and represent the work of a unique cohort of students rather than the broader alumni population.

Triangulation process

To synthesise and compare discursive patterns across the five projects, a cross-case triangulation matrix was constructed. This process highlighted shared patterns, key divergences and critical tensions regarding how the projects addressed the four discourse dimensions.

This triangulated comparison had two main purposes:

- To provide a meta-level perspective on how students interpreted and operationalised the course's critical pedagogical aims through their projects.
- To reveal persistent discursive biases and reformist tendencies despite the course's aspirations, thereby offering critical insight into the practical limits and possibilities of implementing decolonial sustainability education within institutional academic contexts.

The findings derived from this triangulation were integrated into the broader objectives of the course redesign, providing insights to inform future iterations of the course.

Critical discourse analysis in plural sustainability education: triangulated synthesis

Using Fairclough's framework, we analyse five student projects developed within a master's level course, which were redesigned as an action-research process focused on critical environmental education, decolonial approaches and intercultural epistemologies. These analyses highlight the extent to which the projects engage with, reproduce or challenge dominant discourses across four Critical Discourse Analysis dimensions: intertextuality, interdiscursivity, presupposition, representation of events and dialectical pairs. The following synthesis integrates these dimensions with common patterns, divergences and unique traits, and critical observations found and made across projects.

Before delving into individual discourse dimensions, Table 2 provides a comparative overview of the five analysed student projects. The table synthesises key patterns, divergences and critical observations across Fairclough's five Critical Discourse Analysis dimensions. It serves as a diagnostic lens to understand how different projects converge or diverge in their treatment of intertextuality, interdiscursivity, presuppositions, event representation and dialectical structures.

Table 2: Triangulated comparative analysis (across five projects)

Dimension	Common patterns	Divergences/unique features	Critical observations
1. Intertextuality	All five texts heavily draw on **institutional and academic sources** (Organisation for Economic Co-operation and Development, United Nations Educational, Scientific and Cultural Organisation, World Health Organisation, Intergovernmental Panel on Climate Change) to create legitimacy.	"Project A" uniquely uses co-designed visual storytelling, metaphor **and speculative future scenarios,** while "Project B" includes **clinical and participatory tools.**	**High-income country dominance** in source materials **limits epistemic diversity**, excluding Indigenous or low- and middle-income country knowledge systems. In addition, idealised futures may inspire change but can obscure the structural, political and economic conditions required to realise them.
2. Interdiscursivity	All projects mix discourses (e.g. **education, science, policy, technology**) to address multidimensional issues.	"Project C" is the most **pedagogically instrumental**, while "Project B" is uniquely **biomedical + participatory.**	While integration is sophisticated, it sometimes leads to **discursive contradictions** or **uncritical acceptance of technocracy.**
3. Presupposition	All presume that their proposed intervention (art, tech, curriculum, toolkit, reflection) is **feasible and necessary.**	"Project D" assumes **alignment with labour markets** is beneficial; others question tech-dependency more.	Most omit **structural critiques** (e.g. power, capitalism, extractivism), favouring **behavioural/ institutional reformism.**

Dimension	Common patterns	Divergences/unique features	Critical observations
4. Representation of events	All frame a **problem-solution** narrative where **current systems fail**, and **intervention = solution.**	"Project B" uniquely portrays the **self as the site of change;** "Project E frames traditional ecological knowledge loss as cultural trauma.	Events are often reduced to **educational, behavioural, or technological failures,** underrepresenting **political economy or history**.
5. **Dialectical pairs**	All projects rely on oppositions to frame meaning (e.g. **old/new, ignorance/awareness, individual/system**).	"Project A" emphasises **emotion vs. rationality;** "Project D" uses **data vs. experience** heavily.	These binaries simplify reality; they risk reifying **false dichotomies** (e.g. traditional vs. modern, curriculum vs. employability).

1. Intertextuality: legitimising knowledge

Institutional intertextuality often reflects perspectives aligned with high-income countries. International frameworks such as the SDGs, the United Nations Educational, Scientific and Cultural Organisation's Education for Sustainable Development agenda and Organisation for Economic Co-operation and Development labour models frequently guide projects. While these provide coherence and legitimacy, they can overshadow non-Western epistemologies.

Drawing on Fairclough's three-dimensional Critical Discourse Analysis model, such frameworks function as intermediary social practices, mediating between structural norms and individual agency. They shape institutional narratives and knowledge systems, enabling some discourses while constraining others. Critically recontextualising these frameworks allows space for Southern epistemologies and Indigenous knowledge, highlighting tensions and contradictions in hegemonic discourses.

As Maniglio and Barboza da Silva (2021) note, critical and decolonial discourse analysis treats subalternity as a political, interdiscursive and historically embedded praxis. Concepts such as codigophagy[2] and anthropophagy[3] illustrate that students do not merely reproduce dominant discourses but "consume" and transform them. By "digesting" high-income country frameworks and merging them with local memory, they move beyond subalternity towards a subversive, transformative praxis.

The project E exemplifies this praxis by digitalising endangered linguistic and cultural through language education and digital platforms. It symbolically resist cultural homogenisation and demonstrates how institutional narratives can be reimagined to foreground marginalised voices, engaging frameworks like the United Nations Educational, Scientific and Cultural Organisation's critically rather than rejecting them outright.

2. Interdiscursivity: hybridising fields

The projects blend discourses from politics, education, technology and health, creating hybridised understandings of sustainability. However, as Chouliaraki and Fairclough (1999, p. 62) argue, the possibilities for incorporating different voices are shaped by relations of power and social regulation. From this perspective, the

2 The strategic "consumption" of dominant cultural or institutional codes by marginalised groups.

3 This is the act of "swallowing" foreign ideas, stripping away the colonial parts and mixing the "nutritious" parts with local wisdom.

selective articulation of particular discourses may contribute to the reproduction of dominant meanings and social relations.

For example, the "Project D" project instrumentalises education in order to align competencies with labour markets, reinforcing a productivism logic. "Project C" presents digital tools as near-panaceas, underestimating structural barriers. "Project B" combines biomedical and participatory discourses, though structural critiques remain limited. "Project A" merges artistic, scientific and narrative discourses to construct new socio-environmental imaginaries. This reflects the constitutive role of discourse described by Fairclough: "Discourse is a practice not just of representing the world, but of signifying the world, constituting and constructing the world in meaning" (Fairclough, 1992, p. 64). In this sense, bringing different forms of knowledge and expression into dialogue can contribute to reconfiguring how socio-environmental challenges are understood and imagined. Finally, *Project E* articulates identity, territory and Indigenous epistemologies, resisting cultural homogenisation.

Hybridisation can both contest and reproduce knowledge hierarchies, depending on context. While some projects (e.g. "Project A") create symbolic resistance, others address sustainability complexity but retain critical limitations. Interdisciplinarity thus becomes a site of ideological struggle, negotiating meanings, hegemonies and transformative possibilities.

3. Presupposition: implicit assumptions

Bakhtin (1981) emphasises that discourse is embedded in social, historical and cultural contexts. Within this framework, speakers must constantly negotiate meaning inside a multi-voiced, polyphonic environment where different perspectives overlap.

A. Heteroglossia and interdisciplinarity

The cohort's diverse disciplines - from biosciences to linguistics - create a space of heteroglossia in which disciplinary "voices" intersect, clash or complement each other. Speakers mediate these voices to foster understanding while surfacing tensions (e.g. technocratic assumptions in "Project C" or techno-optimism in "Project E).

B. Interculturality and polyphony

Cultural diversity adds complexity: students bring varied values and epistemologies that shape how they frame issues and responses. For Bakhtin, no utterance is entirely the speaker's own; it is shaped by prior voices and social contexts (1981). This cohort's discourse becomes a dialogic space in which Indigenous or low- and middle-income countries' perspectives (e.g. in "Project E) can challenge dominant narratives. The speaker becomes both a mediator and spokesperson, navigating hegemonic and counter-hegemonic discourses.

C. Presuppositions and discursive power

Some projects reproduce unexamined assumptions, such as:

- Green jobs are inherently beneficial ("Green Skills")
- Digital tools can bridge educational divides ("Project C")
- Technology can best address cultural loss ("Project E)
- Behaviour change begins with personal awareness ("Project B")

These reflect dominant discourses with epistemic authority. From a Bakhtinian view (1984), such cases may resemble covert monologues - in which alternative voices are excluded or under-acknowledged. Ethical, dialogic mediation is needed to allow marginalised voices to contest these assumptions and to foster inclusive, situated discourse. Bakhtin's framework encourages seeing the speaker as a dialogic agent - someone who negotiates meaning among multiple voices.

4. Dialectical pairs: Meaning construction in the projects

Fairclough (1992, 2003), notes that discourse actively constructs reality through structural choices. Binary pairs are commonly used in the projects:

- Old vs. new education ("Project D")
- Tradition vs. modernity ("Project E)
- Awareness vs. ignorance ("Project B")

These pairs function as ideational structures, establishing clear contrasts, which facilitates comprehension and positions certain practices as desirable. From Van Dijk's perspective, discourse contributes to the construction and reproduction of socially shared representations through which groups interpret reality. Importantly, Van Dijk distinguishes group-specific knowledge from culturally shared "common ground

knowledge," which is "taken for granted, undisputed, and generally (and discursively) presupposed" (Van Dijk, 2000, p. 94). In this sense, the binary oppositions identified in the projects may contribute to the naturalisation of particular social and epistemic relations by presenting certain values and interpretations as self-evident, while rendering alternative or intermediate positions less salient.

For example, "Project E simplifies the interplay of tradition and modernity, while *Project B* downplays structural factors. Few projects explore dialectical syntheses or "grey areas," limiting critical depth. As Fairclough (1995) argues, a critical reading must reveal how these oppositions are tied to forms of discursive power that privilege certain epistemic frameworks, which are often technocratic or biomedical, while excluding others.

Thus, although dialectical pairs serve pedagogical purposes, they must be critically examined for their potential to obscure heterogeneity, especially in multicultural, interdisciplinary contexts.

Pedagogical implications: towards a critical, plural and transformative education

The triangulated analysis, from hegemonic intertextuality to their simplification into dialectical pairs reveals both the critical potential and limits of project-based learning in sustainability education. Critical Discourse Analysis (Fairclough, 1992, 2003), shows that while project-based learning encourages active, collaborative learning, many projects remain framed by dominant Western epistemologies. These frameworks, though useful entry points, often shape the semantic field of sustainability education in reformist rather than transformative ways. Without deeper critical engagement, the projects risk reproducing institutional narratives instead of situating them in dialogue with diverse epistemologies and lived experiences, producing surface-level change that leaves underlying power dynamics intact.

The Bakhtinian concepts of heteroglossia and polyphony further illustrate this challenge. Despite the cohort's interdisciplinary and intercultural diversity, low- and middle-income countries and non-dominant epistemologies are often marginalised or tokenised. The mere presence of multiple voices is insufficient for a truly plural education; deliberate spaces must be created for discursive confrontation, critical questioning and recognition of locally situated knowledge. Even students from low- and middle-income countries may inadvertently reproduce the devaluation of their own epistemologies, underscoring the need for intentional, critically reflexive facilitation.

Proposed pedagogical strategies to strengthen project-based learning as a tool for social and epistemic transformation

The analysis of student projects indicates that genuine plurality in project-based learning requires deliberate, concrete strategies:

First, move from the "symbolic inclusion" of subaltern voices to centring them epistemically. Project-based learning should be a site of dialogue and *sentipensar* (feeling-thinking), drawing on the participatory knowledge tradition associated with Fals-Borda (1987), operationalised through a cartography of territory and memory[4]. Students should map the histories, memories, languages, ecological practices and knowledge systems embedded in their territories, including those that have been marginalised or silenced, rather than relying solely on abstract global indicators. Such territorial cartography enables students to identify whose knowledge has been preserved, whose has been excluded, and how different forms of knowledge relate to particular places and histories. Integrating ecologies of knowledge treats ancestral wisdom as epistemically equal to scientific discourse. Integrating ecologies of knowledge can then position ancestral and local knowledge systems in dialogue with, rather than subordinate to, scientific knowledge. This approach "territorialises" global sustainability frameworks, making sustainability education more situated, relational and responsive to lived realities, while aligning with UNESCO's commitments to cultural diversity.

Second, Critical Discourse Analysis must be integrated as a mandatory reflexive milestone, a "metacognitive mirror", rather than a final assessment metric. Mid-term discursive audits invite students to interrogate their drafts using Fairclough's dimensions of intertextuality and presupposition, identifying where language may reinforce technocratic or productivism biases. This promotes awareness of positionality, recognising from which territory and cultural memory they speak, and fosters ethical agency and critical thinking in navigating complex, interlinked crises, supporting the United Nations Educational, Scientific and Cultural Organisation's vision for a "new social contract for education."

Third, foster "epistemic discomfort." Create spaces in which institutional norms and frameworks are interrogated, revealing cracks in seemingly neutral discourses. Socratic dissent labs and comparative case analyses require students to territorialise global frameworks against local memories, languages and knowledges. The goal shifts

4 The term is used here as a pedagogical formulation informed by traditions of social and critical cartography that approach mapping as a situated and participatory practice for making territorial relations, histories and forms of knowledge visible (Acselrad, 2022).

from consensus to productive disagreement, allowing students to question not just solutions but the rules defining legitimate knowledge production.

Fourth, expanding modes of evidence, implies moving beyond technocratic metrics to include narrative, symbolic critique and cultural memory. Epistemic creativity incorporates life histories, testimonies, Indigenous languages, artistic expression and embodied knowledge, redefining problems and generating alternative wellbeing indicators. This transforms heteroglossia into a methodological device, disrupting epistemic hierarchies and strengthening student agency, aligned with the United Nations Educational, Scientific and Cultural Organisation's Reimagining Our Futures Together initiative.

Fifth, project-based learning should promote a critical hybridity in which scientific, artistic and Indigenous paradigms actively confront one another rather than being harmonised into a false consensus. Paradigm confrontation seminars evaluate students' ability to sustain epistemic tensions as sources of insight. This exposes complexities invisible in single-paradigm approaches, redefining partnerships as horizontal dialogues of knowledge (SDG 17), and positions diversity as a source of resilience and innovation in line with the United Nations Educational, Scientific and Cultural Organisation's Futures of Education vision.

Finally, these strategies converge in a phase of constructive synthesis that translates critique into collective agency. Strategies converge in collaborative prototyping labs, in which students design hybrid solutions that integrate rather than erase epistemic tensions. For example, a water-management project may combine scientific monitoring with ancestral water-sharing governance. project-based learning thus becomes a laboratory for territorialised innovation, operationalising hope through relational, pluriversal practices and advancing the United Nation's 2030 agenda and the United Nations Educational, Scientific and Cultural Organisation's call for a renewed social contract for education. By positioning territorial, epistemic and cultural margins as co-architects of change, this pedagogy fosters genuinely plural, justice-oriented and transformative education.

The shift from critique to construction advances the United Nations Educational, Scientific and Cultural Organisation's Futures of Education mandate and the United Nations 2030 Agenda by moving beyond problem analysis towards transformative agency. Positioning territorial, epistemic and cultural margins as co-architects of change rather than as mere sites of critique contributes to SDG 17 (Partnerships for the Goals) through a more equitable and inclusive model of innovation.

Conclusions

This case study demonstrates that sustainability education guided by Mejía-Cáceres and Zambrano's principles - recognising the self, territory, symbolic identity and plural knowledge systems - can evolve into a decolonial, critical and affective pedagogical practice. Triangulated analysis revealed that despite structural limitations, student recontextualisation created openings for Southern epistemologies and symbolic resistance.

Projects such as "Project E" and "Project A" illustrate how educational discourse can be reimagined through aesthetic expression, intercultural polyphony and digital storytelling. These interventions go beyond technical solutions, engaging with identity, memory and affect as essential dimensions of sustainability learning. In contrast, other projects remained anchored in productivism or technocratic paradigms, reflecting persistent epistemic asymmetries in institutional contexts.

Aligned with the principle of enhancing diverse knowledge systems through North–South dialogue, this study emphasises the need for deliberate spaces for epistemic discomfort, critical hybridity and symbolic reconstruction. Genuine transformative learning requires not only methodological innovation but also ethical-political clarity: it must be grounded in the lived realities of diverse communities, informed by plural epistemologies and animated by justice, care and imagination.

Ultimately, achieving transformative sustainability education requires a shift not only in what we learn but whose voices shape our understanding. By operationalising epistemic discomfort and fostering collaborative solutions that integrate diverse knowledge systems and local contexts, the university can be reimagined as a laboratory for hope and innovation, a space where plural, justice-oriented knowledge drives action for a sustainable future.

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Interrupting the human gap: hope in environmental education

Sadie Barnes, Sara-Jayne Williams, Erika Peklanska and Rosamund Portus*

Abstract

Environmental education exposes students to the severity of ecological crises, sometimes triggering feelings of anger, anxiety, grief and hopelessness. This paper explores the transformative potential of a hope-based pedagogical approach to supporting learners to engage with these responses. It focuses on the Hopeful Futures Programme, which invites students to use hope theories to explore an environmental topic of their choice.

Using focus groups with current students and graduates, alongside autoethnographic reflections from educators and researchers, this study investigates the immediate and lasting impacts of the Hopeful Futures Programme. The findings reveal that while many students initially experience discomfort when engaging with hope, these emotions can act as catalysts for transformation when supported through reflective, relational and autonomous learning processes. Over time, many students develop more nuanced understandings of hope and report sustained changes personally and professionally.

Four themes emerged: emotional complexity, shifting perspectives, impacts on future pathways and pedagogical insights. The importance of student autonomy, critical reflection and emotional engagement in fostering lasting educational transformation is highlighted. The paper underscores the necessity of integrating hope across the curriculum, not as a passive sentiment but as an active, empowering

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tool for navigating uncertainty and shaping sustainable futures. It thereby creates a role for critical inquiry around hope in interrupting the "human gap."

This research contributes to emerging scholarship on emotional resilience in environmental education. It offers practical insights for educators seeking to support students through existential challenges and affirms the value of emotionally responsive teaching in cultivating empowered, hopeful and future-oriented graduates.

Keywords: hope, environmental education, pedagogy of hope, autonomous learning, transformative learning

Introduction

Learning about environmental crisis in higher education often carries a significant emotional burden for both students and educators (Williams, Portus and De Laurentis, 2024). Without adequate support, this burden can lead to disempowerment and contribute to a broader "crisis of hope" (Kelsey, 2021; Skilling et al., 2023; Portus & Williams, 2025).

In environmental education, supporting students to navigate these complex emotional responses is critical (Ojala, 2012, 2015; Skilling et al., 2023). Higher education shapes students' ambitions, career choices and agency with respect to addressing environmental issues (Gutierrez & Park, 2014). When this learning is not intentionally supported, it can unintentionally widen the "human gap**,**" in which students struggle to translate knowledge into meaningful action (Botkin et al., 1979). This disconnect can deepen a "hope gap" (Upton, 2015), reinforcing the very "crisis of hope" that environmental education seeks to challenge.

In response, educators at the University of the West of England (UWE: Bristol) developed the Hopeful Futures Programme as part of the Environment and Behaviour module, which is rooted in environmental psychology, in the Bachelor of Science Environment and Sustainability degree. Drawing on hope pedagogy and transformative learning, the Hopeful Futures Programme (now in its third year) is designed to encourage students to engage critically and creatively with knowledge they have acquired throughout their degree, through lectures, discussions and a student-led assessment. The pedagogic intention is that students graduate being informed, motivated and empowered to apply their learning, skills and attitudes to their future pathways.

This paper explores the immediate and lasting impact of the Hopeful Futures Programme from the perspectives of current students from the 2025 cohort

and graduates from the 2023 cohort, as well as the educators who designed and deliver it. The paper focuses on understanding how deep reflection on hope and critical thinking can influence students' experiences and shape future pathways, positioning the Hopeful Futures Programme as a dynamic and (potentially) personal transformative learning experience; challenges are also addressed.

Literature review

The human gap: meaning, identity and belonging

The "human gap" describes the psychological and emotional disconnection people often feel between environmental knowledge and their perceived capacity to act (see Botkin et al., 2014). This gap is not merely behavioural; it is existential, signalling a loss of coherence between learning, lived identity and a sense of agency (Kollmuss & Agyeman, 2002; Blake, 1999).

Closely related is the "hope gap," which arises when students grasp the severity of the climate crisis but feel unable to imagine, let alone contribute to, a liveable future (Leiserowitz, as cited in Kelsey, 2020; Marlon et al., 2019). Dominant "doom and gloom" narratives in media and education can amplify these gaps, portraying environmental crises as overwhelming and unchangeable, which undermines motivation and psychological wellbeing (Kelsey, 2020; Ojala et al., 2021; Clayton et al., 2014; Hickman et al., 2021).

Hope-based pedagogies seek to bridge such gaps by re-situating learning within meaning, emotions and connection. Supporting students in engaging with hope at different scales and having their emotions validated and their actions contextualised can help develop environmental identity, responsibility and agency (Fredrickson, 2012; Finnegan & d'Abreu, 2024).

Hope in education: foundational perspectives

In *Pedagogy of Hope*, Paulo Freire (1994) frames education as a relational and emancipatory process. He conceptualises hope not as naive optimism but as a political and ethical stance, enabling learners to challenge injustice and imagine transformative futures. For Freire, hope was central to the pedagogical relationship, and educators had to believe in the possibility of change and nurture it in their students.

Similarly, Hicks (2014) advocated for "educating for hope in troubled times," arguing that without hope, the gravity of global crises can lead students to disengage

from both learning and action. Recent pedagogical literature extends this framing, proposing hope as both an educational goal and a strategy for emotional resilience. These approaches challenge dominant information-transmission models of education by emphasising reflection, agency and imaginative thinking as essential to meaning-making and motivation (Ojala, 2015, 2020; Macy & Johnstone, 2012).

Critically, hope is not averse to discomfort. It thrives in conditions of uncertainty and complexity, offering a way to remain engaged without falling into despair. When educators actively support students to reflect and think, reframing their responses and feelings towards constructive action, hope becomes a mechanism of transformation, not an act of denial (Finnegan & d'Abreu, 2024).

Transformational learning and student autonomy

To address the widening human gap, environmental education should extend beyond information transmission to shape values, skills, attitudes and behaviours (Stickney & Skilbeck, 2020). Young people engaging with environmental content frequently report experiencing eco-anxiety, grief and helplessness (Ojala et al., 2021; Hickman et al., 2021), responses that are intensified when pedagogical approaches fail to create space for reflection or emotional processing (Jones & Davison, 2021).

Transformative-learning theory offers a framework for understanding how students navigate emotionally challenging content by framing disruptive experiences as opportunities to re-evaluate underlying assumptions (Mezirow, 2000). Its application remains contested, however, as such processes often involve discomfort (Boström et al., 2018). These tensions are particularly evident in environmental education, in which students confront the scale and urgency of ecological crises (Ojala, 2023; Govind et al., 2018).

While discomfort can act as a catalyst, transformation requires pedagogical support. Hope-focused pedagogy provides such support through intentional scaffolding that guides students to reframe despair into critical inquiry and action (Ojala & Chen, 2024). Transformative learning respects learner autonomy, recognising that students are active participants in constructing meaning and navigating emotional terrain. This emphasis on autonomy is particularly relevant when considering transitions from formal to higher education and from university to wider life (Cullen & Oppenheimer, 2024). Hope-based pedagogies ask students not just to absorb facts but to interrogate how they shape their identity, values and agency (Kelsey, 2020; Hicks, 2014).

Despite increasing attention to hope in environmental education, there remains limited understanding of how students experience hope and whether it supports their transition beyond university. Existing research tends to focus on short-term

interventions or immediate outcomes, offering little insight into how hope interacts with students' emotional and existential challenges or its potential for bridging the human gap. This gap is often acknowledged but rarely examined through the lens of student experience and long-term pedagogical impact.

This paper combines student responses with educators' reflections, situating them not as isolated narratives but as mutually informing accounts of how teaching and learning unfold. In doing so, it explores how hope-based pedagogies might enable students to develop a transformed, sustained sense of agency, meaning and possibility.

Methodology

To investigate the lasting impact of the Hopeful Futures Programme, focus groups with current students (2025 cohort) and graduates (2023 cohort) (Jung & Ro, 2019) alongside autoethnographic reflections (Adams et al., 2017) from the authorship team were conducted. Ethical approval was obtained, and all data were managed in line with UWE guidelines.

The research team includes two former students, now PhD candidates, who completed the degree in 2023 (Barnes and Peklanska) and the two educators who designed the Hopeful Futures Programme (Williams and Portus). While Williams and Portus were previously Barnes's and Peklanska's educators they have since collaborated on multiple projects, developing long-standing professional relationships that enable trust, openness and nuanced discussion across different perspectives. These intersecting positionalities as former students and educators are uncommon in research contexts and create a unique opportunity for deeper, reflexive insight.

Participants and research design

The Bachelor of Science Environment and Sustainability degree is designed to foster bonded learning experiences between students and lecturers. It prioritises discussion and collaboration, contributing to high levels of student satisfaction (100% for Teaching on my course, Office for Students, 2024

). Its interdisciplinary nature brings together students with a wide range of perspectives and interests, a diversity reflected in the topics chosen for the Hopeful Futures Programme essay, which span policy participation, Indigenous rights, media, activism and critical reflections on climate-related hopelessness.

The Hopeful Futures Programme was developed in response to repeated expressions of hopelessness from students in the 2023 cohort. The programme guides

students through a learning journey integrating theory, reflection and independent inquiry. It is designed to culminate in a piece of work that synthesises these elements, allowing students to demonstrate their learning and personal growth as their final undergraduate submission. Delivered over 12 weeks, students begin with lectures and facilitated discussions on hope theory, then apply these insights in a student-led, 2,000-word essay on a personally significant environmental topic that draws on learning from across the degree. The programme concludes with a writing retreat, where students and lecturers create a supportive environment for collective reflection and focused writing.

This study explores the impact of the Hopeful Futures Programme by engaging with both students and graduates, capturing experiences across different stages of reflection. Participants took part in three semi-structured focus groups facilitated by Barnes and Peklanska: one in-person with current students and two online with graduates from the 2023 cohort. As peers of the graduates and familiar to current students through prior teaching but removed from the Hopeful Futures Programme assessment, Barnes and Peklanska were able to create a supportive environment for open discussion. Williams and Portus were not present as their role as educators may have influenced students' answers.

Eight current students participated in the in-person focus group. Due to challenges in bringing together graduates, two online focus groups were held (two in the first, three in the second) enabling deep discussion and resulting in rich qualitative data.

Each focus group centred on participants' experiences of Hopeful Futures Programme, including their emotional responses, perspectives and perceived programme impact. A semi-structured format was used across all groups, with minor variations in language. Including both current students and graduates enabled an exploration of different timeframes, offering a rare longitudinal insight into the lasting impact of the programme, something seldom possible in educational research.

Autoethnographic reflection

The research team used Gibbs's Reflective Cycle (1988) to guide individual reflections on their experiences of the Hopeful Futures Programme prior to conducting the focus groups. Using six key stages — description, feelings, evaluation, analysis, conclusion and action plan — these reflections drew on autoethnographic methods (Adams et al., 2017) to examine positionalities and experiences. Peklanska reflected as a former student, Barnes as a former student who has taught on the Hopeful Futures Programme over the past two years, and Williams and Portus as

educators who designed and implemented the Hopeful Futures Programme over a four-year period.

Approach to analysis

All data were analysed utilising the six-steps of reflexive thematic analysis (Braun & Clarke, 2019); NVivo was used to assist the coding and theming process. Analysis was conducted by all members of the research team and involved group discussions to deepen the analysis.

The process, which involved coding all data and then developing themes, resulted in the generation of 26 codes. Codes were reviewed, with some merging and others being deemed beyond the scope of this study because they were about generalised university experiences. Iteratively, 20 codes and 11 subthemes were identified, which, through exploring the meanings and patterns among them, generated four overarching themes.

Results

This section presents the results of the thematic analysis, identifying four themes: 1) emotional complexity, 2) shifting perspectives, 3) impacts and future pathways and 4) pedagogical insights.

Emotional complexity

Introducing hope in an environmental degree proved to be emotionally complex for both students and educators. Students' initial reactions were often marked by discomfort highlighting the challenges of hope-centred learning in troubled times (Hicks, 2014). One student described hope as "Greenwashing" (current student 2), while another recalled feeling "really overwhelmed" (graduate 3). Portus, reflected on this complexity noting, "How I introduce and manage this focus on hopeful futures takes a lot of thought, energy, and emotional labour, and forces me to cope with uncertainty."

Students' initial resistance reflected emotional engagement rather than detachment. When facilitated supportively, discomfort can become a catalyst for reflection and transformative learning (Cohen-Lazry et al., 2022). As Williams reflects, "These varied responses show that personal and emotionally responsive pedagogy is not without risk, but it is also full of potential."

Despite early discomfort, many students came to recognise the value of hope in

environmental education. Some who were initially sceptical began to appreciate its role: "I think hope needs to be there, even though initially I was like uhh, now I think to keep people going, we need it." (Current Student 7). As Ojala (2015) suggests, when hope is introduced with supportive scaffolding, it can guide students from initial discomfort towards reflection and action.

Shifting perspectives

Engagement in the HPF prompted meaningful shifts in many students perspectives on hope that unfolded gradually, rather than in a singular moment. These transformations emerged through autonomy, discomfort, discussion, relational engagement and reflection at different stages of the programme.

One graduate who had initially stated that they were "really not feeling very hopeful" later reflected that the programme "did spark something, and some days I feel more hopeful. Sometimes I don't. But now I have some resources" (graduate 5). Similarly current students described synthesising multiple theories and internalising hope: "My understanding of hope has probably changed from all the different theories I've read … I've been able to combine them into a version of hope and understanding of how I experience hope" (current student 3).

Students' moments of shifting perspective were shaped by their individual experiences and values. One graduate described exploring childhood films: "The message at the end: there's a way back, there's a hope for us, don't give up yet. That's what I focused on: how important it is and how it impacted me as a child" (graduate 2).

Students' reflections illustrate how hope became personally meaningful and relevant, rather than purely theoretical. By providing space, tools and frameworks, the programme fostered critical reflection, autonomy and relational engagement, supporting deeper, sustained learning. Peklanska reflected:

"Writing about hope required me to reflect on my own experiences, emotions, and values. I realised that incorporating emotional literacy into academic work not only enriches the writing but also makes it more relevant and human."

Not all students experienced transformations: "I did learn more about hope, but I don't think it really changed how I feel" (current student 2). These findings suggest that shifts in perspective are neither linear nor universal but deeply relational, shaped by prior beliefs, values and engagement in the process. Transformations may also emerge over time, as evidenced by more students in the graduate cohort reporting such shifts, suggesting that the impact of the Hopeful Futures Programme can become clearer with reflection and distance.

Impacts and future pathways

Hope-centred critical inquiry, informed by transformative learning, was associated with emerging long-term impacts. The Hopeful Futures Programme demonstrated potential to bridge the human gap by supporting students' sense of agency and future thinking. While the impact of hope pedagogy depends on individual beliefs and values, our findings suggest it can foster meaningful, long-term change.

One current student described the programme's influence on their future career trajectory: "I think that's what sort of pushed me to pursue becoming a policy analyst and making changes through policy, not just to help this country, but other countries around the world." (current student 3).

Our findings suggest that the Hopeful Futures Programme helped students translate their learning into change for their futures, interrupting the human gap. As Barnes reflected on the programme's influence on her academic career: "It was a personal and meaningful piece of work that I'm very proud of … I was able to begin figuring out who I wanted to be as a researcher and how I wanted to make a difference, becoming the groundwork for what my PhD would later become."

Graduates also reported applying hopeful thinking beyond university to wider societal contexts, reflecting both cognitive and emotional growth; "I'm more aware of looking out for positive messages now […] it does feed back into the positive mindset." (graduate 2). Others became critically aware of the absence of hope, particularly in media dominated by crisis: "It's really hard to be anything other than pessimistic with things you see in the media currently … but there are plenty of people working on incredibly important things that have a lot of hope and a lot of potential for change" (graduate 4).

These reflections highlight how the Hopeful Futures Programme can cultivate agency, allowing students to envision futures that feel possible. However, graduates demonstrated a deeper understanding of the relational dimensions of hope, suggesting that temporal distance from formal education enabled more critical reflection. Current students appeared more immersed in the process itself, which may have limited their ability to recognise and apply their shifting perspectives and learning.

Pedagogical insights

There was consensus among students that hope should be integrated earlier in the degree. As one student noted, "It might have been nice to have it earlier on in the course ... to give people something more to build on, to know that you can focus on hope" (current student 4).

Feelings of hopelessness accumulated throughout the degree, suggesting that the emotional weight of environmental studies was intensified by a lack of space for reflective and emotional engagement (Jones & Davison, 2021). Introducing hopeful practices earlier may help students understand hope as a radical tool in the face of environmental crisis (Webb, 2007). Developing this understanding from the outset allows students to intertwine learning with the formation of personal beliefs and values, further interrupting the human gap.

Students still valued ending the degree on a message of hope as it motivated them for the future. As one graduate shared "It was a good ending I think to motivate me to be like, oh OK — so the next step in my sustainability career, it feels more positive" (graduate 2).

Teaching in engaged and emotionally resonant ways requires bravery, not just expertise. As Williams reflected: "I had to decide whether the desire to do something more creative, with more work attached in the organisation and facilitation and with the potential for influence over student satisfaction, particularly in final year was worth the risk."

Introducing hope is complex as educators must hold space for challenging conversations while ensuring all students feel supported. Portus reflects, "There are many ways to ground classroom activities to allow for supported critical discussion to occur … often the conversations move towards personal experiences and perspectives. And inevitably, sometimes these views can offer conflictual or challenging perspectives." This kind of teaching goes beyond information transmission, demanding emotional labour, courage and a willingness to embrace uncertainty.

Discussion

Our findings suggest that to interrupt the formation of the human gap, we must first address the hope gap among environmental students. Educational approaches that go beyond conveying the urgency of environmental challenges and increasing knowledge is needed to foster critical thinking, emotional resilience

and empowerment. Managing the emotional complexities associated with education is essential for ensuring that knowledge becomes a catalyst for action and not a source of discouragement. Environmentally focused programmes are ideal spaces to guide, assess and support student learning and to foster knowledge alongside motivation, confidence and capacity to drive meaningful change (Portus & Williams, 2025; Skilling et al., 2023).

Most participants of the Hopeful Futures Programme learnt how to be(come) hopeful by working with feelings of hopelessness, beginning to interrupt the human gap. In participants' reflections we observe patterns that suggest transformative learning has the potential to occur through the Hopeful Futures Programme (see Figure 1). Participants experienced discomfort and reluctance when introduced to hope, but through discussion, exploration and reflection — processes that can be extended and returned to — understanding begins to emerge. Many learners experience disorientation, dilemma and challenges to their thinking, often experiencing moments of change or realisation. Transformation can happen here, and for some, continue to occur. The impact of this pedagogical approach is deeply personal, shaped by each student's unique lived experiences, values and their willingness to engage. Encouraging autonomy through relational and embodied practises is key to its transformative potential (Miles, 2019; Mezirow, 1997).

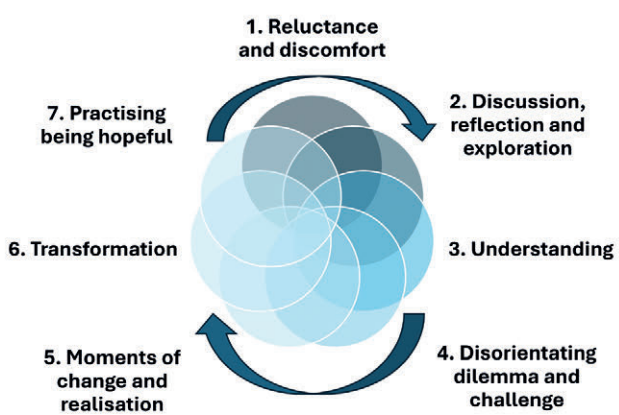


Figure 1: Students' learning experience through the Hopeful Future Programme

Patterns of reflection and engagement suggest that the Hopeful Futures Programme cultivates systems thinking by situating students' emotional responses and sense of agency within interconnected socio-ecological systems. Rather than treating environmental issues as isolated problems, the programme frames them as dynamic networks of relationships, uncertainty and feedback loops. By engaging with hope as an active stance and interweaving it with a topic of their choice, students learn to navigate complexity, recognise interdependencies and embrace uncertainty as a space for creative and ethical action, complementing systemic thinking with resilience and meaning-making (Finnegan & d'Abreu, 2024; Pihkala, 2017).

The Hopeful Futures Programme also fosters key sustainability competencies. Critical inquiry and imaginative thinking support anticipatory competence, enabling students to envision alternative futures (Ojala, 2023), while autonomy and ethical reflection strengthen normative competence (Freire, 1994; Hicks, 2014). Collaborative discussions cultivate interpersonal competence, and translating knowledge into action develops strategic competence (Miles, 2019). Hope acts as a connective thread across these capacities, embedding emotional resilience, and demonstrating how hope-based pedagogy enriches sustainability education by integrating reflective, emotional and systemic dimensions (Wiek et al., 2011; Jadallah et al., 2025).

While the Hopeful Futures Programme had positive impacts, integrating hopeful pedagogy throughout an entire degree could provide a stronger foundation for transformative learning to occur. This approach would better equip students with the resilience, skills and sense of purpose necessary to bridge the human gap, connect knowledge with meaning, respond to environmental crisis, and ultimately, experience education as an empowering and emancipatory process (Freire, 1994; Ojala, 2015).

Initiatives like Hopeful Futures Programme can be risky to include in mainstream teaching, especially in higher education, where metrics that centre knowledge acquisition can be prioritised. This disjuncture is intensified by the prioritisation of cognitive mastery over emotional and ethical reflection. These more engaging and potentially transformative practices can disrupt traditional approaches; educators must be brave and learners must be open. They require time to show measurable change, which is often beyond the scope of what is measured as success. However, their potential for deep, transformative impact makes them a powerful, if often under-evidenced, part of innovative education.

By exploring current students and graduates' perspectives, our findings revealed significant differences across cohorts, highlighting that students are not a homogenous group and that their engagement with environmental education and hopeful thinking varies widely (and thus needs to be carefully managed by educators).

These perspectives enriched our understanding of both immediate and longer-term educational and personal development, underscoring the importance of temporality in evaluating meaningful learning experiences.

There is still further research needed to understand how implementing this approach throughout an entire degree rather than a 12-week programme could impact students and further interrupt the human gap that is so prevalent in society. We need to explore how students of environmental-focused degrees can enter wider society emotionally engaged, with knowledge and meaning intertwined into their sense of purpose and future pathways.

Conclusion

This paper considers both the immediate and lasting impact of a novel teaching and learning programme which utilises a hope-based pedagogy, combined with transformative teaching theory, to help environmental students bridge the human gap. Our findings reveal the messy, complex and yet invaluable nature of engaging environmental students with questions of hope in a time of crisis. We observe the importance of time and development, noting that many students experience some discomfort with engaging with the topic of hope initially. We noticed a pattern in some students' experiences involving autonomous engagement in research, reflection and understanding that culminate (at some individual point) in moments of change or realisation. We note that often students remember and practise hope long after the programme has finished, and in many cases, their participation in the programme has led to longer-term changes beyond learning. The research shows that, when carefully guided by educators who are brave and willing to facilitate a programme such as Hopeful Futures Programme, engaging with the idea of hopeful futures helps students reflect not only on the global crisis but also on their own responses to it.

Having investigated this from both current student and graduate perspectives as well as drawing on the educators and researcher's reflections, the research establishes the importance of environmental education including opportunities for students to engage in thinking and learning about hope, recognising its potential to support students in addressing a hope gap and thereby interrupting the human gap. In doing so, it affirms the critical role of hope not as a passive sentiment but as a generative and active force that equips students to navigate uncertainty and shape more intentional, resilient and responsible futures.

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Hope in leadership labs: reimagining African higher education as hubs for transformational, sustainability-focused leadership

Silas Oghenemaro Emovwodo[*] and IfeKristi Ayo-Obiremi

Abstract

Higher education plays a vital role in shaping ethical, adaptive leaders to confront global challenges and promote sustainable futures. This study investigates how Bowen University, Nigeria, employs transformational leadership and collaborative learning through programmes like the One Day Management Team Initiative, Bowen Baptist Students Fellowship, departmental executives, and Students Representative Council. A quantitative analysis examines how these experiential roles foster skills in ethical decision-making, systems thinking and resilience, echoing the Club of Rome's vision for systemic, hope-driven solutions. Surveys from students highlight that these structured leadership opportunities boost empathy, collective problem-solving and preparedness for real-world issues. The findings align with Astin and Astin's (2000) research on extracurricular engagement enhancing collaboration; Dvir et al.'s (2002) work on transformational leadership tying personal values to societal needs; and Kolb's (1984) experiential learning theory, which underscores reflective practice, linking theory to ethical action. By connecting local efforts, such as sustainability projects, to global objectives like the Sustainable Development Goals. Bowen positions universities as leadership incubators. This approach, rooted in Nigeria's postcolonial context, challenges hierarchical norms, fostering equity-focused, student-led solutions. Advocating hands-on, collaborative learning, the study supports the Club

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of Rome's No Limits to Hope initiative, urging curricular reforms that prioritise agency and interconnectedness. Ultimately, it reveals higher education's potential to transform classrooms into laboratories of hope, cultivating leaders who redefine possibilities with courage and creativity.

Keywords: hope, transformational leadership, higher education, Africa, Nigeria, pedagogies

Introduction

Higher education in Africa and particularly, Nigeria, is being challenged to reimagine itself beyond a site for knowledge transmission to being a transformative incubator for sustainability-focused leadership. This aligns with the urgent global call to equip young adults with the traits, characteristics and qualifications needed to address systemic crisis, as indicated in Botkin et al. (1979), who call for educational systems that foreground human initiative, societal relevance and moral engagement in the face of increasing complexity.

Global crises are believed to be a product of a human gap, which is the widening distance between the growing intricacies of global issues and humanity's lagging capacity to respond effectively to them (Botkin et al., 1979). Learning must, therefore, shift from maintenance learning (upholding and reproducing the status quo) to innovative learning, which includes anticipatory and participatory engagement. In Nigerian higher education, this demands a transformation of leadership training and style to build resilience, ethical decision-making and systems thinking among students and young adults.

The transformational leadership theory posits that transformative leadership produces positive change by stimulating and inspiring followers to achieve outcomes in the interest of the whole group, rather than in the interest of individuals. This leadership style hinges on ideal influences, inspirational motivation, intellectual stimulation and personal attention on the part of the leader (Odumeru & Ogbonna, 2013). Dvir et al. (2002) also opine that transformational leadership interventions can align personal values with societal goals, enhancing followers' development and performance. Astin and Astin (2000) further assert that leadership in higher education must be socially responsible, inclusive and oriented towards the common good.

All of these put together, help to ensure followers understand and embrace the goal of the whole group, which leads to progress, as they project the importance

of including leadership development into experiential, student-driven programmes in universities and higher institutions of learning. Leadership rooted in personal growth, institutional ethics and social commitment ensures that, beyond being ready for employment, higher education graduates are capable of tackling global challenges like inequality, climate instability and government deficits.

Experiential learning and leadership competencies

The experiential learning theory published by Kolb in 1984 highlights the role of reflective practice in translating theory into action. The clinical model of experiential learning as highlighted by Kolb embraces concrete experience, reflective observation, abstract conceptualisation and active experimentation (Kolb, 1984). Learning through doing, especially in structured extracurricular roles enables students to develop ethical discernment and decision-making capacities. This theory is practiced in Bowen University's extracurricular activities, such as the One Day Management Team initiative; among departmental executives; on the Students Representatives Council; and by those in faith-based leadership roles — namely, the Bowen Baptist Students Fellowship executive positions. Participation in these roles enhances competencies in systems thinking, resilience and ethical judgement, as they help to stimulate real-life leadership scenarios, giving participants hands-on exposure to budgeting, planning, decision-making, team management and policy deliberation. Through these roles, students are able to simulate problem-solving scenarios, which deepen their readiness to navigate societal challenges; this experience is part of what makes students stand out in competitive postgraduate opportunities, fellowships and community-based innovation projects.

Adapting these theories in African and Nigerian hubs of learning, innovation in leadership development will help tackle and provide solutions to structural deficits in government, economy and service delivery. Thus, the alignment of academic curricula with real-world applications promotes a culture of proactive engagement and social agency.

Participatory learning and sustainability-focused leadership

Participatory learning is central to learning and sustainability education. Botkin et al. (1979) argue that participation fosters solidarity in space, i.e. it binds learners to their communities, instils empathy and a sense of co-responsibility. Without anticipation however, participation can lead to misguided action and participation without anticipation breeds elitism.

For participatory learning to take place appropriately, there is the need for an integration of collaborative leadership structures, embedded in teaching, participation and institutional culture (Eustachio et al., 2024) in the higher education institutions. Hands-on, collaborative leadership labs will enhance shared decision-making, dialogue and empathy, and will therefore operate as pedagogical spaces in which sustainability values are enacted rather than merely taught. In their roles on Bowen University's One Day Management Team, departmental executives bodies, Students Representative Council and Bowen Baptist Students Fellowship students participate in deliberative processes and community outreach initiatives, which constitute what Botkin et al. (1979) describe as "societal learning." This, he says is a mode of learning in which individuals and institutions evolve through reciprocal engagement with their social environments.

Furthermore, participatory learning gives room to institutions to embrace the co-creation of knowledge, which is an opinion championed by African thinkers who argue that true development must be localised and relational. Students occupying roles across faith-based, academic, entrepreneurial and administrative functions in Bowen University demonstrate that participatory leadership can prepare students to work within diverse institutional, national and global contexts.

Universities as laboratories for hope

At the apex of this study is the framing of universities as laboratories of hope. Botkin et al. (1979) envisioned universities as spaces that "analyse the past, test the present, and prepare alternative futures" (p. 96). This challenges universities to move from hierarchical, discipline-bound structures to issue-oriented structures. In the African and Nigerian context, this will involve demolishing colonial legacies that relegate students to passive roles and instead, embrace and foster agency, critical reflection and co-creation.

The United Nations Education for Sustainable Development framework, in its educational theory, advocates for curricula that integrate values, future literacy and critical thinking (UNESCO, 2020). Similarly, Sterling (2011) argues for "sustainability-oriented education" which nurtures relational thinking and regenerative leadership. These frameworks supports the idea that African universities should serve as ecosystems of transformative learning, linking local innovations like community-driven waste management or climate advocacy to global sustainability goals. Supporting this educational theory, Chigbu and Makapela (2025) argue that data-driven and participatory leadership structures in African

universities enhance inclusive decision-making and institutional responsiveness, creating conditions in which students are not merely recipients of policy but active contributors to institutional development. Such leadership environments cultivate hope by signalling to students that their voices matter in shaping sustainable futures.

Thus, universities like African Leadership University and Bowen University, among others, have implemented practical models of mission-driven education. In African Leadership University, the use of problem-solving laboratories, cross-disciplinary learning teams and student-driven governance prepares the students to take on leadership roles in the society after graduation. The Bowen University's One Day Management Team, departmental executives, Students Representative Council and Bowen Baptist Students Fellowship initiatives also prepare students for leadership roles. Both institutions, among others, empower students to shape institutional priorities, manage uncertainty and act with responsibility.

Curricula reform to embrace collaborative learning

The reform of existing curricula is necessary for institutional transformation. There is a global call for universities to reorient themselves towards societal relevance through anticipatory and participatory methods. In Nigeria, the curricula often embrace lecture-driven and content-heavy structure; but in order to bring about progress in the society and among students, curricula should include leadership labs, institutional support and collaborative projects to foster innovation and leadership culture (Asiedu et al., 2020). Collaborative learning reinforces cognitive competencies and cultivates affective qualities like empathy, cross-cultural understanding and dialogue. Meaningful participation involves shared ownership of problems and mutual understanding of solutions that are critical for sustainable social transformation (Botkin et al., 1979; Asiedu et al., 2020). Collaborative learning should move beyond theory to community action, as is exemplified in Bowen Baptist Students Fellowship's leadership outreach to secondary schools and community sanitation projects.

Beyond community involvement, collaborative learning fosters innovation, as students from diverse faculties come together to propose solutions to institutional challenges as they develop entrepreneurial, ethical capabilities and present evidence-based recommendations to university administrators.

Hope as pedagogical orientation

Hope in itself is not a naive emotion but a pedagogical orientation, which challenges educators to cultivate imagination, courage and agency in students and learners. Freire (1994) argues that hope is a critical component of emancipatory education, which provides the will to act in the midst of uncertainty. Within leadership labs, hope manifests through collaborative foresight, student-led innovation and the belief that current systems can be remade.

Meadows et al. (2004) opine that sustainability requires leaders who are capable of systems visioning, personal reflection and collective action. Bowen University's laboratory model embodies this by encouraging future leaders to test real-time interventions. Participants are, therefore, not just observers, but actors, who co-design pathways for change.

Media coverage of the Bowen One Day Management Team initiative (formerly, the One-Day Vice Chancellor initiative) confirms that experiential leadership practices resonate beyond the campus and into wider society. These frame students as change agents who are responsible for implementing policy, driving reform and reporting impact within a tight timeframe (Adio, 2025).

As African higher education institutions are framed as sites for imaginative, anticipatory and participatory learning, student leadership programmes are key instruments in building the competencies needed for regenerative futures. The transformation of universities into laboratories of hope will not only address local problems but prepare students to contribute meaningfully to global issues. Thus, institutions like Bowen University offer a pattern for sustainability-focused leadership rooted in African realities.

Leadership roles in Bowen University

Bowen University is a private, faith-based university, owned and established by the Nigerian Baptist Convention in 2001 (Times Higher Education, 2025). The Bowen Baptist Students' Fellowship is a group of faith-based student-leadership positions for which students are elected in the penultimate and final year for the period of one year to serve in various capacities in the Christian chapel. It is the official student representative body that bridges the gap between the university management and the students (Bowen University, 2024). Being the only religious fellowship allowed on campus, student-leaders work closely with the University chaplaincy to direct the religious and administrative activities of students on campus.

The One-Day Vice-Chancellor initiative was established in 2021, and involved one student, after a series of rigorous application processes, emerging as the university vice-chancellor for a day. The student takes on full responsibility for and enjoys the privilege of the office for the whole day (24 hours). This initiative was enhanced in 2025 when it expanded into a "full One-Day Management Team," where students, after a series of tests and assessments took on key leadership roles in the university. This included vice-chancellor, deputy vice-chancellor, registrar, bursar, librarian and chaplain (Bowen University, 2025).

Discussion

Impact of leadership roles on personal development

The quantitative survey data collated from 37 Bowen University student leaders indicate that leadership roles such as Bowen Baptist Students Fellowship executives, departmental executives, Students Representative Council members and One Day Management Team initiative participants have a significant positive impact on personal development. Participants rated items on a Likert scale from 1 to 5 in levels of importance (1 = lowest, 5 = highest), with high overall ratings across key competencies such as decision-making skills [M (mean) = 4.32, SD(standard deviation) = 0.75], resilience (M = 4.37, SD = 0.90), empathy (M = 4.25, SD = 0.85), confidence and creativity (M = 4.41, SD = 0.70), and preparedness for life after school (M = 4.29, SD = 0.80). This finding implies that leadership positions foster a variety of skills that are vital for individual growth and personal development.

This is consistent with the transformational leadership theory that contends that leaders inspire and intellectually stimulate their followers (Odumeru & Ogbonna, 2013). Bowen Baptist Students Fellowship executives who, for instance, are tasked with organising health campaigns or educational workshops get to develop a sense of empathy and social responsibility by addressing the real needs of their community and assisting the marginalised in Iwo, Nigeria. Participants in One Day Management Team engage in activities that simulate the act of executive decision-making, dealing with hypothetical organisational crises like budget cutting or stakeholder conflict, thereby honing strategic thinking and ethical judgement. The departmental executives who plan an academic symposia or career fair also develop a set of organisational and time management skills as they navigate the constraints of an organisation and participate in a diverse team under the pressure of tight deadlines. At the same time, the Students Representative Council becomes a training ground in which members can develop negotiation and representation skills in their interaction with

the university administration on matters such as hostel fees or fee structures.

These roles also help to develop graduates' capabilities to lead such complex entities as diverse and multinational corporate teams or to grapple with social problems such as poverty and bad governance in Nigeria. This process of development mirrors Kolb's experiential learning theory (1984), according to which concrete experiences, such as event planning, promote reflective observation, like evaluating the outcome of the event. These stages are followed by abstract conceptualisation, such as creating better plans for the next event, and finally active experimentation, implementing improved plans in the subsequent tasks. The data point to the fact that Bowen University has been successful in producing well-rounded individuals capable of leadership outside of academia.

Students' perceptions of the university's role

Most students at Bowen University feel the university integrates leadership opportunities as a part of the academic framework. Survey responses from the 37 participants provided an average rating of 4.16 (SD = 0.95) for the statement "Bowen University has done well to integrate leadership opportunities into our learning curriculum" indicating strong agreement. Likewise, the mean score for relevance of the capacity for combining scholarship and leadership roles was 4.21 (SD = 0.88), which implied appreciation for a holistic educational model. These understandings are compatible with Botkin et al.'s (1979) participatory learning model, which holds that an important part of education should be a process of actively responding to social problems.

Bowen's organised extracurricular programmes, for example, One Day Management Team's business simulations or Bowen Baptist Students Fellowship's community projects, provide a practical means of complementing theoretical coursework taught in classrooms, rendering it more relevant. This approach aligns with globally emerging educational trends such as those advocated by the United Nations' framework for Education for Sustainable Development (UNESCO, 2020) which encourage curricula that promote values of sustainability, critical thinking and employability. For example, One Day Management Team initiative participants may simulate managing and running a sustainable business by integrating a future literacy-focused programme that could tackle grass roots sustainability issues, while the Bowen Baptist Students Fellowship projects tackle concerns relevant to the local community's sustainable future, such as clean water access.

However, it was noted that the open-ended responses point to one particular challenge: balancing leadership and academic demands. As one student noted, "It

is actually very tough trying to balance these lives together," pointing to the strain of dual responsibilities. This indicates that while Bowen's model is effective, providing further support mechanisms — be it through time management workshops, peer-mentoring or more flexible assignment deadlines — could be helpful to reduce student stress and improve performance. Addressing these concerns would further enhance perceptions of the university's dedication to student success.

Alignment with theoretical frameworks

These data from 37 survey respondents strengthen currently established theories, and the alignment of these theories gives more insight into leadership development at Bowen University. The high ratings in the personal development aspect, i.e. decision-making (M = 4.32) and confidence (M = 4.41), are consistent with the focus on follower growth or intellectual stimulation proposed in the transformational leadership model (Dvir et al., 2002). This is evident through, for example, the mean score for "Because of the leadership position, I am able to think better" at 4.23 (SD = 0.79) which underlines the importance that the theory places on promoting creative thinking via challenging activities.

Also, the participatory learning framework (Botkin et al., 1979) was present in the increased score of empathy (M = 4.25) as leadership activities promote empathy and co-responsibility. Bowen Baptist Students Fellowship leadership, for example, engage and collaborate with local community-based stakeholders fostering a sense of a common purpose. These findings also corroborate Kolb's (1984) experiential learning cycle in that students have a concrete experience (e.g. running Students Representative Council campaigns), reflect on that experience and how they can do better, conceive of ways that the experience can be improved or made to be a better one and then apply that learning to future engagements or initiatives.

Bowen's findings exceed findings reported in other comparable studies. Kularatne et al. (2021) reported an averages score of 3.8 among students participating in experiential learning during the COVID-19 pandemic while attending other programmes, while Bowen's average of 4.37 is itself much higher, likely because of the year-round leadership programmes' structured nature. However, the potential limitations of a small sample size or self-report bias highlight the need to further explore and validate these findings in future research across broader populations.

Al-Mansoori and Koç (2019) also note that when leadership structures emphasise vision, empowerment and shared responsibility, students and faculty alike demonstrate greater innovative capacity and institutional engagement. In this context, student leadership programmes function not only as governance tools but

as motivational spaces that nurture hope, confidence and a sense of purpose among emerging leaders.

Findings from the comparative leadership programme

In African higher education contexts, student participation in real-world leadership roles is increasingly recognised as vital for preparing future leaders. Bowen University's one-day vice-chancellor and management team exercise place students in active decision-making roles, offering experiential learning that extends beyond traditional classroom instruction. While there are no clearly stated programmes at African Leadership University, Kigali and other African Institutions that mirror this exact initiative, African Leadership University's educational model similarly foregrounds student agency and leadership preparation. At African Leadership University, students declare *missions,* not majors, which enables them to align their learning with real-world challenges and pursue action-oriented work from the outset of their studies, blending academic theory with practical, community-engaged problem-solving and internships across the continent (ALX Africa, 2025). Although African Leadership University does not replicate Bowen's model directly, its emphasis on student participation in leadership processes supports broader African efforts to position universities as laboratories for transformational and sustainability-focused leadership.

This mission-driven, "learning through doing" approach fosters leadership competencies as students negotiate complex problems, collaborate with peers and mentors, and participate in experiential projects that build critical judgement and adaptive capacity (NECHE on the Road, 2022). Similarly, other African institutions also embed leadership development into student experiences, often through project-based learning and community engagement mechanisms, even if not formally titled as student governance roles. Together, these examples suggest a broader trend in African higher education towards integrating leadership preparation into curricula, reinforcing the value of initiatives like Bowen's in cultivating transformational, sustainability-focused leaders.

Implications for higher education in Nigeria

Student participation in institutional governance has been identified as a critical pathway for leadership development in African higher education. In their study of Nigerian universities, Habeeb and Eyupoglu (2024) demonstrate that exposure to strategic planning and transformational leadership processes significantly improves

institutional performance and sustainability outcomes. Initiatives such as Bowen University's student-led management simulations mirror this participatory logic by allowing students to experience leadership responsibilities first-hand, thereby preparing them for future roles in organisational and civic leadership.

Particularly in a country like Nigeria, where higher education is under increasing pressure to address some of its greatest systemic challenges in the areas of unemployment and corruption (Botkin et al., 1979), Bowen University's model seems to offer a promising blueprint. Very good grades on the positive perceptions indices, for example, "seeing life differently" (M = 4.30, SD = 0.85), demonstrates that the leadership programmes are preparing students to actively engage and confront societal challenges with resilience and ethical integrity. This aligns with the framework of socially responsible leadership proposed by Astin and Astin (2000) which positions Bowen graduates as possible change agents for Nigeria's public and private sectors.

In the African context, other institutions could draw inspiration from Bowen's approach in an effort to bridge the human gap that exists in Africa between global challenges and local capacity (Botkin et al., 1979). In Kenya or Ghana, where similar socio-economic issues persist, for instance, Bowen Baptist Students Fellowship's community projects could be replicated and the focus on leaders that promote sustainability can be adapted. This could be even more impactful if it is combined with cross-institutional collaborations like joint leadership summits or even a shared online platform. There is also the technological possibility of bringing these programmes to rurally located institutions that have no resources for the above-mentioned virtual simulations (e.g. One Day Management Team -style simulations and exercises) or e-learning modules which could allow these programmes to be carried out, improving accessibility and creating a network of sustainability leaders across the continent.

Recommendations for enhancing leadership programmes

Though Bowen's leadership programmes are achieving great results, feedback from the 37 student respondents provide insight into areas for improvements. Common suggestions call for more training (e.g. "Every leader should be subjected to continuous leadership trainings"), more involvement in decision-making (e.g. "Encourage student involvement in decision-making processes") and recognition (e.g. "Recognise students who excel"). This feedback suggests that structural adjustments could make the programme even more effective.

Bowen could fill these gaps by starting a tiered leadership programme that includes workshops around conflict resolution, strategic planning and emotional intelligence, similar to those found at institutions like African Leadership University (Baker, 2019). Pairing student leaders with alumni or industry experts to act as mentors would provide more personalised guidance as students negotiate and bridge between academic learning in the classroom with professional realities beyond the four walls of school. Students Representative Council members, for instance, might consult an alumnus in government to fine-tune advocacy strategies.

Another recommendation is to increase student agency in governance. The development of student-led policy committees or advisory boards would enable leaders to influence university decisions, supporting the co-creation of knowledge advocated by Botkin et al. (1979). Awarding or certifying excellence might encourage participation even further. As a whole, these actions would strengthen Bowen's position as a "laboratory for hope" (Botkin et al., 1979), developing leaders who actively promote change in the communities they represent.

Conclusion

Data from the survey of 37 student leaders confirm that leadership positions at Bowen University offer students substantive growth in several personal and professional capacities, with ratings over 4 in important areas. These results are in accordance with both transformational leadership theories, as well as with experiential learning and participatory education theories establishing Bowen as a leader in developing sustainability-focused talent. Through specific policy recommendations, such as addressing the need for formal training, mentorship and additional leadership roles within the university, they can make a greater impact in their programmes to ensure that young people are able to tackle the various, intricate issues that Nigeria and Africa face. This positions Bowen as a model for cutting-edge, transformative higher education on the continent.

These African perspectives affirm that student participation in leadership is not merely administrative but deeply formative. By engaging students in decision-making, innovation and sustainability practices, African universities cultivate hope as a lived experience, one grounded in agency, responsibility and the belief that institutional systems can be transformed from within.

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Environmental education: case of the Nairobi Summer School on Climate Justice

Najoua Bouraoui[*]

Abstract

According to many environmental activists and educators, environmental education is a fundamental tool for changing behaviours to protect natural resources and contribute to sustainable development. It plays a key role in both formal education, such as schools and universities, and informal education, including activities carried out by civil society organisations, public administrations and other stakeholders. Efforts are also being made to strengthen environmental education through initiatives such as summer schools.

In this regard, our contribution highlights the importance of environmental education in general, with particular emphasis on the opportunities offered by summer schools, such as the Nairobi Summer School on Climate Justice (NSSCJ), from which our association has benefited. We have sought to apply this experience in Tunisia while ensuring that it is properly contextualised within the national framework.

This contribution addresses the following key points: defining and establishing the foundations of environmental education; presenting the Nairobi Summer School on Climate Justice; and outlining the involvement of our association, Association pour la Protection de l'Environnement et le Développement Durable de Bizerte (APEDDUB), in environmental education and in the Nairobi Summer School.

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Introduction

Environmental education and education for sustainable development are currently experiencing renewed interest, both in France and internationally. However, the approaches and perspectives adopted vary from one country to another, particularly regarding the conceptualisation and implementation of sustainable development. In recent years, the term "environmental education" has been widely used in Tunisia, reflecting a specific approach to environmental and educational issues. Awareness-raising, education and continuous training on environmental and sustainable development issues are among the priorities of the Tunisian state. Together, they form an essential triptych underpinning public environmental policies, particularly in relation to climate change mitigation, adaptation, resilience and the transition towards ecological sustainability.

Since 1988, considerable efforts have been made to raise awareness among all segments of society, particularly children and young people about environmental issues at the national, regional and global levels. The aim is to ensure that all stakeholders can actively engage in the sustainable development process and effectively address related socio-economic challenges.

The challenge for tomorrow's world will therefore be to make access to education simpler and more equitable. This will help foster more inclusive societies while raising awareness among younger generations about environmental protection and the fight against climate change.

Further efforts are needed to transform the educational system: environmental education is more necessary than ever to support the ecological transition. It therefore aims to:

- Raise awareness of more sustainable consumption patterns.
- Teach daily eco-friendly practices.
- Encourage participation in environmental protection activities as a family.
- Promote activities that involve direct contact with nature.
- Introducing environmental protection issues through books and artificial intelligence (AI).

Nairobi Summer School initiative

The Nairobi Summer School on Climate Justice (NSSCJ) is an initiative led by the Pan African Climate Justice Alliance (PACJA). It is an annual event that brings together experienced climate justice actors, young activists, committed advocates and practitioners in the field.

The programme is based on a diverse range of modules delivered by internationally renowned experts and academics, alongside leading African strategists and activists working on climate justice. NSSCJ aims to raise awareness, build capacity and inspire a new generation of actors in Africa and globally, enabling them to engage in climate justice issues while attending to both intra- and intergenerational equity dimensions.

Its primary objective is to strengthen the capacities of Africans and their allies to promote climate justice through interventions at various levels: local, national, sub-national, regional and global.

More specifically, NSSCJ seeks to:

- Equip a new generation of actors with the knowledge, skills and tools required to contextualise climate change concepts in relation to African realities and those of the Global South.
- Strengthen existing climate justice capacities through information sharing, peer learning and mutual mentorship within the Global South and beyond.
- Enhance advocacy capacities, particularly for African and Global South actors, to inform climate justice and equity narratives based on research and lived experiences at local, national, regional and international levels.
- Encourage and expand networks and collaborations that contribute to advancing climate justice within international climate discourses and interventions, particularly regarding adaptation, mitigation and resilience-building in the face of the climate crisis, for the benefit of vulnerable and marginalised groups in Africa and the Global South.
- The implementation of NSSCJ is grounded in blended learning approaches that combine lectures, presentations, case studies, audiovisual materials, facilitated discussions, group work and field visits.

The programme is structured around three complementary phases:

- An online pre-training phase, during which all selected candidates complete a preliminary assessment.

- A face-to-face training phase, in which participants who successfully complete the online pre-training take part in 12 intensive days of training at the University of Nairobi.
- Post-training sessions focused on networking and strengthening the NSSCJ alumni community in order to reinforce connections and sustain the growth of the climate justice movement.

The training modules cover the following themes:

- Module 1: Introduction to climate change — causes, impacts and responses
- Module 2: Introduction to climate justice
- Module 3: Climate justice and global governance
- Module 4: Just transition and access to energy
- Module 5: Climate justice and finance
- Module 6: Green economy and entrepreneurship
- Module 7: Advocacy and communication for climate justice
- Module 8: Climate justice issues in specific sectors and contexts

These modules are organised around several thematic pillars:

- Pillar 1: Agriculture and food systems
- Pillar 2: Climate change and health
- Pillar 3: Climate security (peace, security and migration)
- Pillar 4: Climate change and water resources
- Pillar 5: Climate, gender and social justice (women, youth, children, and vulnerable and marginalised groups)
- Pillar 6: Climate justice, education, culture and faith
- Pillar 7: Human rights and environmental rights

In terms of achievements, NSSCJ has trained over 2,000 young people both in person and virtually, from 87 countries across Africa and beyond, through four cohorts organised between 2021 and 2024.

Our association, APEDDUB, participated in two cohorts of the Nairobi Summer School in 2022 and 2023. Following these training programs, APEDDUB became actively involved in the initiative through the implementation of two projects "Smart

Agri" and "Vitaleau" — as well as several other environmental education activities.

The Smart Agri project

Context and objective

The project is implemented in the Ghazala region (Bizerte), an area marked by soil degradation and watercourse pollution, resulting from the intensive use of chemical fertilisers and pesticides. These practices threaten local biodiversity and undermine the sustainability of agricultural holdings and the livelihoods of local communities.

Within this context, the Smart Agri project aims to introduce climate-smart agriculture by combining traditional knowledge with innovative techniques to reduce chemical inputs while maintaining productivity. The project promotes the use of local plants with biopesticide potential and strengthens the resilience of agricultural systems to environmental pressures and climate change.

The project is based on the mobilisation and training of local stakeholders, particularly women and men farmers, agricultural services, and seed and agricultural input traders. It encourages knowledge-sharing and learning through practical, field-based approaches and includes the documentation and dissemination of good practices at local, regional and national levels.

Finally, Smart Agri contributes to the empowerment of women leaders in the region by equipping them with the skills required to replicate and adapt these sustainable practices, thereby ensuring the long-term sustainability of environmental and socio-economic benefits.

Target area and institutional framework

This project focuses on environmental protection and biodiversity conservation through inclusive local development based on sustainable agriculture in Gousset El Bey and Joumine, two rural localities within the Governorate of Bizerte (Tunisia).

The pilot experiment was carried out on land belonging to the agricultural services of the municipality of Ghazala, under the delegation of Mature. The plot is managed by the Territorial Extension Unit (CTV), an administrative body under the supervision of the Regional Commission for Agricultural Development of Bizerte (CRDA). The site consisted of a bare plot surrounded by a few tree plantations, including olive and fruit trees.

Field activities

Preparatory and planning work was carried out jointly with CTV managers and technicians. Two consultation, discussion and planning meetings were organised at the CTV headquarters. Once the concept was clearly explained and understood by the partners, the process was structured into the following stages:

Step 1: Surveys were conducted among the project's target populations on the traditional uses of plant species with biopesticide properties for crop treatment, including best practices, targeted diseases and pests, plant parts used, preparation methods and application techniques.

Step 2: The project intervention area was explored, and available plant species with biopesticide potential were identified.

Step 3: 14 fact sheets on plants with biopesticide properties were produced.

Step 4: The field was prepared, including the seedbed being ploughed.

Step 5: Plant species were selected: cultivated crops and plants were chosen for their biopesticide, attractive or repellent properties. The selection focused on summer crops commonly grown in the region, with seeds available on the local market, as well as on varieties traditionally preferred by local farmers.

Step 6: Seedlings and seeds were procured from the local market in Mature, including tomatoes, peppers, cucumbers, carrots, turnips, onions, garlic, basil and peppermint.

Step 7: Intercropping principles, combining neutral species with repellent or attractive plants were used for the layout and planting. Seedlings were planted in a staggered pattern to maximise beneficial interactions between crops.

Step 8: Approximately 10 carob trees were planted in rows and spaced at intervals of around 10 metres. Although this semi-forest tree has no direct effect on crops, it was introduced to demonstrate to technicians and farmers during scheduled training sessions the ease of planting them, their high survival rates and the multiple benefits of this multipurpose species. The trees will remain in the field after the experimentation phase.

Step 9: Crops were maintained and managed; they were irrigated, hoed and mulched.

Impact of the initiative

- **Report 1:** Case of Gousset El Bey and Joumine report (Tounsi K, 2022) assessed the potential for biological crop treatments in areas adjacent to the Ichkeul National Park identifying opportunities and constraints related to the use of biological treatments in the region.
- **Report 2:** This document catalogued local plants with biopesticide, aromatic and medicinal potential in the Ghazal–Joumine area, contributing to the scientific foundation of the project (Boussaid M. and Tounsi K., 2023)
- **The "Ghazal Vegetable Basket":** The harvest was presented in the form of a vegetable basket known as the "Ghazal Basket." This initiative promoted the dissemination of good practices in water, soil and forest conservation, in the presence of the head of the CTV, agricultural service technicians, members of a partner association, the person responsible for field monitoring and maintenance, and a representative of farmers from the project intervention area.
- **Video production for children's environmental education:** Children under the age of five participated in the creation of videos presenting the Smart Agri project, demonstrating creativity and engagement. These videos serve as awareness-raising and educational tools for sustainable agriculture.

Lessons learned

- No chemical pesticides were used throughout the entire crop growth cycle.
- No chemical fertilisers were applied. The project benefited from the existing organic richness of the soil, which had been left fallow for several years.
- No signs of nutrient deficiency were observed. Mulching techniques were used to reduce evaporation and limit supplementary irrigation needs.
- The harvested produce was healthy, of good quality and reached maturity without difficulties.
- All field activities — planting, sowing, hoeing, mulching, irrigation, guarding and harvesting — were carried out by people from the project intervention area. These individuals will serve as entry points within the territory to replicate the same full-field experimentation this year with women leaders, who will, in turn, act as coaches for other women.

The Vitaleau project

Context and objective

The Vitaleau project aims to facilitate access to safe drinking water for vulnerable populations. It seeks to improve access to potable water and sanitation in the Ouled Omor area, located in the Governorate of Siliana, through the implementation of a nature-based solution. The project involves the installation of well-maintained hydraulic and sanitation infrastructure made available to the local community, with the objective of easing the daily burden of water collection.

The project also includes the organisation of awareness-raising workshops to encourage community members to make their voices heard, better understand the current situation of the Ouled Omor community, and identify the main constraints faced by local populations and the solutions developed by women to secure access to drinking water

Institutional framework

In a context in which the impacts of climate change are increasingly evident, the Vitaleau project — funded by the Arab Institute of Human Rights and the Worldwide Fund for Nature (WWF) — was implemented by APEDDUB, in partnership with the National Institute of Agronomic Research of Tunisia (INRAT) and the Regional Commission for Agricultural Development (CRDA) of Siliana. On 27 November 2024, the project deployed an innovative and sustainable solution to address water scarcity in the Ouled Omor region.

Field Activities

Each activity played a key role in achieving the overall objective of the project, while strengthening the community's capacity to manage water resources sustainably. A summary of the main activities and their contributions is presented here:

1. **Field prospection and community diagnosis**

   The project team organised meetings with local stakeholders and conducted field surveys to better understand the living conditions of the population. Participatory approaches, such as storytelling, were used to collect testimonies from community members, particularly women and marginalised groups. This activity enabled the identification of key challenges faced by residents, including water scarcity and geographical isolation, and informed the design of context-specific interventions.

2. **Community capacity building**

Training sessions were organised to raise awareness of human rights, particularly the right to water and sanitation. Special emphasis was placed on gender equity, with awareness sessions highlighting the central role of women in domestic water management. These activities strengthened the community's capacity to manage water resources and advocate for their rights. Women, who are often responsible for household water management, were equipped to actively participate in local governance, ensuring a more equitable distribution of responsibilities.

3. **Partnership development**

The project collaborated with institutional partners, including the CRDA of Siliana, the National Institute of Rural Economy (INRAT) and the Governorate of Siliana, to benefit from technical expertise and institutional support. These partnerships enabled resource mobilisation and ensured the effective implementation and sustainability of the proposed solutions.

4. **Awareness-raising on sanitation and sustainable resource management**

Awareness sessions were conducted to educate the population on the importance of sanitation and sustainable water management. These sessions promoted responsible practices related to water use and conservation.

Through these activities, the Ouled Omor community acquired essential skills for the sustainable management of water resources, contributing to the reduction of social inequalities and the improvement of the wellbeing of marginalised rural populations.

5. **Delivery of water storage tanks**

- 16 tanks of 1,000 litres were distributed to 16 local families, providing immediate and secure access to drinking water.
- One 5,000-litre tank was allocated to support the needs of the regional commission.
- One 3,000-litre tank was provided to supply the delegation and strengthen community-level water provision.

Project impacts

Prior to the intervention, families primarily women and children had to walk more than 20 kilometres, often under hazardous conditions, to collect limited quantities of water. Today, these households benefit from direct access to safe drinking water,

significantly improving their safety and quality of life.

Households now save valuable time previously devoted to water collection, allowing them to engage in income-generating or educational activities. For example, rural women have been able to establish women's agricultural development groups, replacing long and exhausting journeys to water sources with productive economic initiatives.

Access to this basic resource has strengthened local solidarity and reduced social inequalities by enabling families to participate more equitably in regional development. The project also contributed to strengthening relationships between the association, local stakeholders and funding partners.

In addition to these social impacts, the project has had an environmental impact. The provision of water storage tanks is a nature-based solution that promotes rational water management through sustainable techniques adapted to local climatic constraints.

Lessons learned

Through this project, APEDDUB's activities contributed to the objectives of the Voices for Just Climate Action (VCA) programme and Disaster Risk Reduction (DRR).

Thanks to this programme, the voices of marginalised communities were amplified, concrete solutions to water access challenges were implemented, and vulnerable populations participated in awareness-raising sessions and received training on climate change.

Local civil society and marginalised groups are now better positioned to play a central role as designers, facilitators and advocates of innovative, inclusive climate solutions.

Other environmental education actions implemented in Tunisia

These actions are consistent with and build upon the Nairobi Summer School initiative, which include the following:

Climate-smart agriculture and ecosystem restoration

- Raising awareness and supporting rural communities in home-based micro-gardening for responsible food self-sufficiency, including the use of biopesticides, composting and the cultivation of fruit trees.
- Promoting sustainable aquaculture solutions to improve food security and nutrition while creating employment opportunities.

Climate education

- Trained APEDDUB members educate children on water and energy conservation, waste segregation at source (particularly plastic waste) and tree planting.
- Capacity-building and dedicated training programs for Tunisian NGOs entitled "Developing a Funding Strategy for an Environmental Association."
- Women, youth and farmers are supported in acquiring climate-smart skills to build resilient livelihoods.

Green and blue economy

- Promoting alternatives to single-use plastics, such as the production of plates and utensils made from palm leaves.
- Waste-to-energy solutions: converting waste into energy through composting and recycling, with CO_2 and ash reused in concrete production.
- Ocean education programme for youth: training for coastal communities under the theme "Working with Coastal Communities and Exploring Biodiversity and Recycling."

Youth negotiators

- Training for advocacy and lobbying in support of climate justice at the Conferences of the Parties (COPs).
- Young negotiators serving as presenters and speakers at COPs and other regional meetings.

Recognition and awards

- The Ministry of Environment honoured APEDDUB in recognition of its efforts in environmental conservation education and sustainable development

initiatives during the 2023 Clean-Up Year[1].

- APEDDUB received the Best Video Award for projects implemented under the Ministry of Environment, presented during the National and World Environment Day celebrations.

Conclusion

Protecting the planet is a responsibility shared by all generations. The role of older generations is to raise awareness among younger ones about environmental issues. Whether at school or at home, it is now essential to introduce ecological education from an early age.

Passing on good practices and fostering environmental awareness from childhood enables children to understand the importance of preserving the planet. Through playful tools and a touch of creativity, it has become easier than ever to engage young people in environmental education.

Environmental education is therefore a fundamental component to promoting behavioural change aimed at protecting natural resources and contributing to sustainable development. It plays a key role in both formal settings, such as schools and universities, and informal contexts, including activities carried out by civil society organisations and public institutions.

There are also initiatives aimed at strengthening environmental education through events such as summer schools. In this context, our contribution highlights the importance of environmental education in general, with a particular focus on the opportunities offered by summer schools, such as the Nairobi Summer School on Climate Justice (NSSCJ), from which our association has greatly benefited. We have sought to apply and contextualise this initiative within our local context.

1In 2023, The ministry of environment of Tunisia organized a city cleanup for the collection of plastic waste and our association participated in this campaign by involving young people and organising an environmental education workshop on the negative effects of plastic waste.

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Interlude:

Bridging Feeling and Sensemaking

Shapeshifting — an autobiographic exploration of a sustainability journey

*Leonie Paul**

Abstract

This article emerges from a space of hope and desperation. Through an autobiographical lens, I explore how life experiences have (re)shaped the way I frame sustainability and my role within it. Drawing from nine *shapeshifting* incidents over more than a decade, I trace how certain incidents challenged my cognitive frames and set in motion processes of reframing. While the literature around reframing highlights the interplay between external factors and internal sensemaking, this article adds an emotionally embodied perspective. Emotional responses and ongoing reflection emerged as central dynamics that initiated or deepened my reframing shifts. Emotions became signals of inner misalignment. They represented openings through which deeper inquiry began. Reflection then served as the bridge, connecting feeling with sense-making, and at times, action. This article presents a lived inquiry into what it means to navigate shapeshifts from within to external transformation. It invites you, as a reader, educator, facilitator and change-maker, to consider how we might open learning and living spaces that welcome emotional and reflective depth as integral to the reframing processes needed for sustainability transformations.

Keywords: cognitive frames, reframing, emotions, reflexivity, sustainability transformations, autobiography

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No room for silence

Foreword

If you're reading these pages, chances are that I don't need to tell you about the meta-crisis we're currently living through.

You already know.

You have read the headlines.

You have seen the images.

Images of starving children, raging wars, plastic-stuffed seabirds, forests turned into ash, and oil slicks shimmering across once-crystal waters.

But beyond the noise, you also feel it.

Sometimes it's a low hum beneath your skin. An uneasy itch you brush away.

Other times, it rises like fire in your throat, burning and hot, demanding to be screamed out.

I feel it too.

You're not alone.

The silent SCREAM is real.

It's a dance I know well.

A sway between motivation and exhaustion, between fierce hope and the urge to give up.

An act of shifting our shapes to fit into often broken but certainly rigid systems.

And yet, here you are. Still reading. Still caring.

That means something.

Let's take it from here.

For a long time, I believed my experiences, struggles and dreams were not worth sharing. They felt too small, too emotional, too complicated, too unacademic. Today, I believe these stories, while deeply personal, are part of a larger imaginary. What I carry within me is not just a history of events but a living process of (un-)learning and inner transformation that mirrors the broader challenge "we" all face: how to live well and responsibly in an age of meta-crisis.

I do not write to offer conclusions or recommendations. I am writing to open a space. A space for readers, like you, to reflect on your own sustainability journeys. If we are to bridge the "human gap" between what we know and how we live, then our inner worlds must be part of this conversation.

What is your sustainability story? What moments have shifted how you see the world? And how might sharing such stories become a practice of hope that invites others to join the necessary work of reshaping the present and future?

This is a warm invitation to the initiation of embodied sustainability, both personal and collective.

Showing up whole

Introduction

We know by now that sustainability isn't something you simply "solve." Instead, the concept appears as a constantly evolving, deeply entangled knot of challenges, trade-offs, responsibilities, griefs and dreams. It stretches from the tiniest of daily decisions to the most complex global systems. And we're still far from the kind of large-scale transformations needed to truly protect current and future generations.

Still, I hope.

And still, I stay with the trouble.

It's May 2025, and more than 10 years have passed since I consciously began what I now refer to as my sustainability journey. I've climbed mountains of studying, crossed rivers of eco-anxiety, hiked paths through foreign cultures, and witnessed oceans of people sharing their pearls of wisdom and waves of compassion. Like so many others, I've become a vehicle of stories, decisions, stumbles and growth that I can't fully map.

However, if transformation is personal as much as it is structural (Woiwode et al., 2021), then the stories we live and tell, including our own, become crucial sources of insight (Riedy, 2022). Fortunately, as a scholar, I've been trained in critical thinking and analysing complex phenomena systematically. And this is where autobiographical work as a method enters the picture. Rather than distancing myself from the research as a neutral observer, I take seriously the notion that my own journey through sustainability is not separate from my academic work. Instead, it is foundational to it.

In this piece, I write from many roles: as a researcher, educator, founder of a non-profit, woman, friend, partner, daughter and aunt. Each of these identities

shapes how I experience and make sense of sustainability. I approach research not as a process detached from myself but as a deeply personal and relational one that holds the potential for inner and outer transformation. Such an approach to sustainable development can be applied beyond academia. After all, sustainability transformations call on anyone engaged in systems to reflect, reframe and reimagine their roles and responsibilities within them.

From my researcher lens, I like to begin from the inside out, aiming to better understand how we make sense of the world around us. More particularly, I work with the concept of cognitive frames. These are the mental maps we carry within us, shaped by, e.g. experience and culture, that help us interpret the world and decide how to act in it (Walsh, 1995). They filter what we notice, shape how we understand problems and inform our responses to those problems (Cornelissen & Werner, 2014). I like to imagine these frames like inner landscapes: for some, the concept of sustainability appears as a central, bustling metropolis; for others, it might be a quiet village or might not be marked on the map at all. In times of overlapping crises, cognitive frames can quietly shape if and how people engage with sustainability (Hahn et al., 2014): whether we feel invited in or pushed away, whether we perceive agency or futility, whether transformation seems necessary, threatening or even imaginable.

This marks the starting point for my inquiry:

How might we (re)shape individuals' cognitive frames for sustainability transformations, particularly in privileged contexts?

The quest aligns with a broader call for transformative (un-)learning that embraces emotions or embodiment as powerful levers of change (see Grund et al., 2024). In times like these, when everything feels fragile, maybe what we need most is to show up whole. To bring not just our titles, but our experiences. Not just our theories, but our hearts. To stop pretending we have it all figured out and start listening more deeply to what is shifting within and around us.

Cognitive frames and shapeshifting (reframing)

Theoretical background

In contrast to approaches that focus primarily on external strategies for sustainable development, such as technological innovations, I believe that a critical part of enabling sustainability transformation lies in examining our internal beliefs and ways of seeing the world. This perspective is increasingly reflected in sustainability science, which highlights the need to integrate insights from psychology, the arts

and other social sciences to enrich our understanding of complex sustainability challenges (Woiwode et al., 2021).

Sustainability, therefore, is not a singular concept but a multidimensional one. Our cognitive frames can represent diverse and sometimes conflicting interpretations of what sustainability means (Hahn et al., 2014; Murcia & Acosta, 2022). While some cognitive frames align, others diverge widely, often explaining the tensions we encounter in sustainability work.

Cognitive frames can be shaped by a person's upbringing, cultural context, professional environment and lived experiences (Walsh, 1995). In our current economic system, sustainability is often framed through a business frame, where it serves primarily as a means of enhancing competitiveness and profit-generation (Hahn et al., 2014). This can lead to surface-level sustainability expressed through, for instance, greenwashing or short-term fixes. Shifting away from such actions related to business-case frames becomes essential.

Fortunately, cognitive frames are not fixed. They can evolve, expand and shift, a process known as reframing. This might occur when individuals begin to reinterpret reality in fundamentally different ways, often in response to new insights or experiences (Murcia & Acosta, 2022; Rein & Schon, 1996). Current work highlights language, metaphors and social interaction as key drivers (Riedy, 2022). However, the literature around reframing for sustainability is still emerging, and there is limited consensus around the specific conditions or triggers that enable these kinds of cognitive changes (Luoma & Martela, 2021).

An emerging body of literature suggests that emotions may play a key role in shaping cognitive frames. Emotional responses have been shown to influence our attention, perception and decision-making (Bleda & Pinkse, 2023). For example, emotions such as empathy can increase our willingness to engage in pro-environmental behaviour (Brown et al., 2019). Other emotions, like anger or frustration, can act as internal signals that something feels wrong, prompting a desire for change (Wright & Nyberg, 2012). These emotional states are able to not only accompany but also initiate processes of reflection and action (Grund et al., 2024). Despite growing interest in this area, we still have much to learn about the interaction between emotions and cognitive reframing. Ultimately, we may be able to foster reframing processes in ways that support truly sustainability-focused transformations, internally and externally.

Autobiography as reflexive inquiry

Methodology

This piece draws on autobiographical research to explore the link between inner and sustainability transformations. Rather than observing from a distance, I reflect from within by tracing memories and critical incidents that have shaped how I understand and practice sustainability in life and work.

Autobiography as a method positions the researcher as observer as well as subject, inviting a deep engagement with internal dialogue and sensemaking (Walker, 2017). Particularly interesting for this piece is that autobiographical research allows insights into cognitive processes often connected to critical incidents (Sjoberg & Kuhn, 1989). This opens up the opportunity to reevaluate the outcomes of past events and make arrangements for possible futures (Walker, 2017). As a result, reflexivity becomes a critical component of autobiographical work, requiring deep engagement with my own experiences and acknowledging subjectivity in the research process. It challenges the traditional notion of researcher objectivity, recognising how personal experiences shape my work (Jones & Bartunek, 2021).

With this article, I follow Anteby's call to break the taboo against telling one's own stories (2013). By allowing researchers to engage with the narratives they study wholeheartedly, a reflexive framework opens up to deepen our understanding of individuals, organisations, sustainability and more (Daskalaki, 2012; Jones & Bartunek, 2021). Sharing and examining personal stories in larger social contexts creates the foundation for a multilayered case study, inviting resonance and contrast (Anteby, 2013).

And what is there to lose? At worst, we gain insight into one person's sensemaking. At best, we contribute to a shared exploration of what it means to live, care and act in these "interesting" times.

A timeline of shifts

Data collection

To explore my sustainability journey and the cognitive shifts within it, I employed a reflective, autobiographical approach centred around a timeline exercise (see Paul, 2025). Using pen and paper, I drew a simple representation of my life (timeline) and began marking key personal and professional milestones as well as moments when sustainability entered my awareness. This process invited me to trace back

how my understanding of sustainability evolved, including moments that, only in retrospect, were clearly connected to sustainability.

From this broad timeline, I identified nine critical incidents that marked significant shifts in mindset or behaviour. While I acknowledge that more nuanced or smaller incidents exist, I focused on those memories that emerged with the greatest clarity and significance.

To enrich this process, I revisited artifacts like photos, interview scripts and LinkedIn posts, using them as prompts to recall thoughts and emotions I experienced during this time. I supplemented my writing with voice memos, which helped me process and articulate complex feelings and insights. Additionally, I engaged in somatic coaching sessions focused on sustainability agency, which provided valuable reflection space.

Throughout this data collection process, I maintained a digital journal in which I recorded reflections, added notes and documented the timeline visually, supporting ongoing reflexivity. Importantly, this work focuses solely on my own experiences and interpretations; I do not claim to speak for others, and the identities of individuals in my stories are treated with care.

Lastly, while writing these autobiographic narratives, the collection of stories feels incomplete in the sense that my current sustainability frames are not a stable or robust construct. Instead, I acknowledge the continuous moving, or shapeshifting, nature of my cognitive frames.

Connecting the knots

Data analysis

The analysis process in this autobiographical research departs from traditional qualitative methods by centring personal reflection, narrative construction and emotional resonance as core analytical tools (Daskalaki, 2012). Rather than using predefined coding schemes or external thematic frameworks, the analysis embraced an iterative approach that honoured the lived and embodied nature of the cognitive shifts I experienced.

Reflection took place primarily through writing, reconstructing each incident as a personal narrative that encompassed the external event, my immediate thoughts and the associated emotional and physical sensations. Throughout the process, I acknowledge my own biases and privileges, particularly questioning how multiple roles and socialisation might have influenced my perceptions and interpretations,

aiming to enrich the depth and authenticity of the analysis.

The recognition that critical incidents were accompanied by strong emotional responses set the point of departure for the analysis. It was only through deep immersion in the reflective process, which I achieved by retracing the steps and trying to connect the "knots," that I began to realise just how central these emotions had been all along. This insight positioned emotional experience as a primary lens through which to interpret my cognitive reframing. Lastly, writing this article represents an important building block in the reflection and, therefore, analysis process.

Shapeshifting

Findings

Through this autobiographical reflection, I identified nine critical shifts that marked moments of internal change in how I perceive and engage with sustainability. These shifts unfolded over more than a decade, shaped by personal, professional and educational encounters. While the full stories behind each shift are shared in an extended timeline document (scan Figure 2), I present here a synthesised overview of the key insights. In Figure 1, I visualise the sequence of shifts, including the external stimuli that prompted them and the internal responses they evoked. Given the deeply personal and context-specific nature of these experiences, attempting to categorise or generalise them risks oversimplifying the complex ways in which transformation unfolded. However, looking across these shapeshifting incidents, three patterns began to surface.

First, each moment of internal shift was sparked by an external stimulus. This could be visual (documentary or photography), educational (learning exercises), interpersonal (encounters and role models) or experiential (working in the sustainability field). These stimuli challenged existing perspectives and unsettled what I thought I knew.

Second, they were consistently accompanied by strong emotional responses. Rather than categorising these as good or bad, I describe them as powerful, ranging from sadness, anger and frustration to awe, admiration, curiosity, inspiration and even shame. Often, these feelings were layered or even seemingly contradictory. What felt overwhelming in one moment might later also reveal itself as motivating.

Third, reflection emerged not as a singular act, but as an ongoing thread that tied my experiences together across time. Emotional responses often triggered a desire to learn more, to question deeply, or to change something in how I lived or worked.

In this way, reflection became the bridge between emotion and transformation, allowing new insights to take shape and, over time, shift the contours of my thinking and action.

The observed shifts did not unfold in a straight line. Some were sudden, others took months to fully land. Some led to visible changes in behaviour, while others reshaped how I relate to the world and sustainability internally. Together, they map a non-linear but cumulative evolution of my sustainability sensemaking. The table below (Table 1) offers short insights into these described shifts. In the next section, I will explore how these findings connect with the present conversations on sustainability transformations.

Table 1. Overview of shapeshifting incidents

Shift 1: Documentary	*I remember bawling my eyes out. I remember sadness, shock and disbelief. I remember the overwhelming feeling of betrayal. How could I not know about this? Why has no one ever told me? Why don't we learn about this at school?*
Shift 2: Natural Disasters	*I see pictures of dead bodies, fully destroyed buildings, crying faces, people trying to help, people trying to save themselves, people fighting for their lives. […] I learned that people tried to flee by train on the very same train tracks I walked past, but drowned in the carriers when the wave hit. It was too late to escape. […] The people running the museum are relatives of victims who died in the Tsunami. I think I still saw the pain in their eyes. I leave the place with a heavy heart.*
Shift 3: Education	*Fast forward, […] it made "click" for me. While this might be obvious to most readers, for me, with my sustainability consciousness at that point in time, it was mind-blowing. Have you ever heard of ecosystem services? I had not.*
Shift 4: Female Empowerment	*I must admit, it made me shy away at first. Heated discussions and witnessing women taking up space and being "so much", "too much"(?) made me uncomfortable. It made the "good girl" in me uncomfortable. The side of me that so desperately tries to fit in and to be accepted and to be liked and cared for. The part in me that is always shape-shifting.*

Shift 5: Non-Profit Foundation	*Having this weekly reminder that what started as a seemingly insignificant butterfly wing flap (Fie and I writing a project proposal) has turned into this, let's say, strong breeze of transformation and rethinking […] (this experience) wants me to believe that all numbers aside, my actions and therefore actions of every single individual do matter.* *And the moral of the story is: start flapping your wings*
Shift 6: War and Conflicts	*I did ask myself during the photographers' presentation whether all the issues we often speak about in the classroom and beyond […] should be my priority if, at the same time, wars are raging and conflicts are escalating in brutal violence. […] I haven't found an answer to my initial question: how can we talk about sustainability when there is war? But in the meantime, I understand and acknowledge the complexity of systems and dynamics that are shaping sustainable development in its widest form, I believe, much better.*
Shift 7: Collaboration	*Some of the shifts I'm sharing here are instant […] while others are dragging on for months and months. This one took at least one year until I shifted. […] I tried to collaborate, and I failed. This story is not one of my brightest moments, and it feels vulnerable to share. […] Looking back, this is quite an ignorant thing to think when my experience is limited and mainly based on the academic context in high-income Western societies. I remember being so frustrated and annoyed with our process that I eventually started showing up with this negative attitude during online meetings, which became noticeable to our partners. […] Six months later, I was invited to present the larger program at a conference. […] I sat back down and debated with myself on whether to share the true story or just a generic overview of online exchange examples. I chose the trickier option and recalled what truly happened in the collaboration with our partners.*

Shift 8: Sustainability Terminology	*It was only when I started writing research proposals for PhD positions myself […] that I noticed something was not aligned. Sustainability was and is everywhere […] The inflationary sustainability trend was right up my alley, and then again, not really. My understanding of sustainability did not seem to match the versions of other scholars, politicians, friends and colleagues.*
Shift 0: Timeline Exercise	*I wouldn't describe my upbringing as particularly connected to nature. […] Even more scary, I find the lack of sustainability education throughout my school path, where learning languages, mathematics, and chemistry was prioritized over any day-to-day political, social and environmental events and future outlooks. I was not aware of GHG emissions, the impact my lifestyle has on resources, gender issues, wars and conflicts taking place around the globe. By not being aware, I probably mean I did not care. These issues did not enter my mental map.*
Update May 2025	*The knots I'm speaking of are heavy. I'm speaking of racism in all forms, structural, inherited, internalized. I'm speaking of my own and the histories of my ancestors: colonialism, displacement, genocide. I'm speaking of my ego, the drive to earn more, buy more, to be more. The knots, my knots, are the habits of exploiting human and non-human life for convenience, comfort and control. My convenience, my comfort and all under my control. So again, I ask:* *What am I willing to sacrifice?*

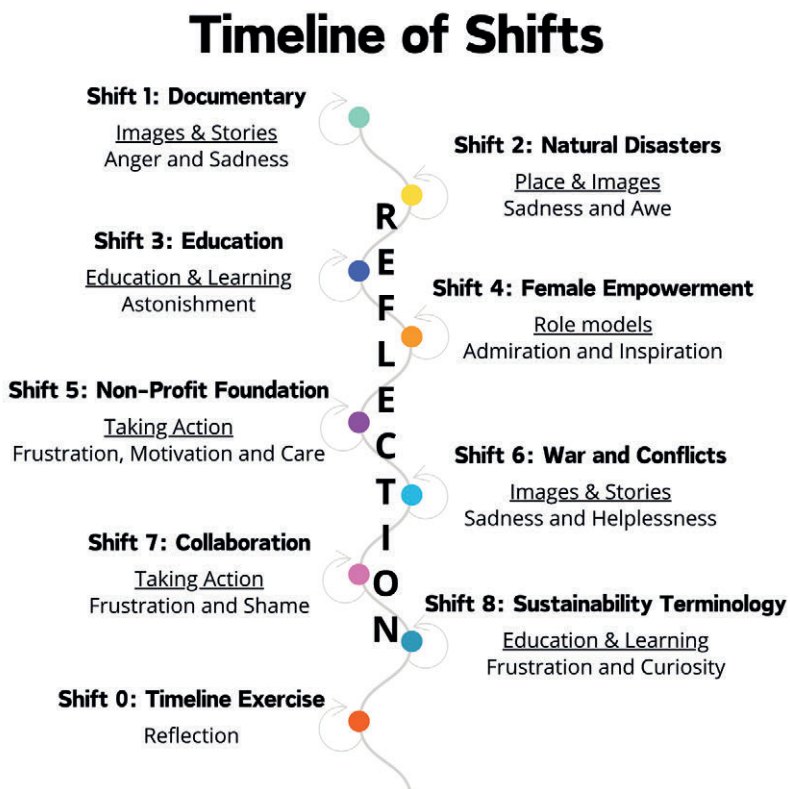


Figure 1: Timeline of shapeshifting incidents

Figure 2: Link to Sustainability Stories[1]

1https://youtu.be/Z1drhgCv8zM?si=8T2PdyYqpQf3SGve

Shapeshifting spaces

Discussion

This article began with a question: *How might we (re-)shape individuals' cognitive frames for sustainability transformations, particularly those in privileged contexts?* Through the lens of autobiographical reflection, I sought to illuminate how my own frames have shifted through critical incidents that prompted deep emotional and cognitive engagement.

What emerged most clearly through this inquiry was that transformation is rarely purely intellectual. Instead, it appears to be initiated and fuelled by emotional and somatic experiences. I speak of moments that touch something deeper than cognition alone. In these incidents, an external stimulus catalysed a powerful internal shift. I found myself unsettled. Emotions like anger, shame and helplessness, but also awe and inspiration, stirred a need for realignment. I experienced this as an internal pull towards coherence between my values, knowledge and action. I *shapeshifted*.

This dynamic aligns with present discourses around reframing and emotional cognition (Bleda & Pinkse, 2023; Grund et al., 2024). But it also extends them. What my reflections suggest is that emotions don't just accompany reframing; they may well be a necessary precondition. Emotional disruption cracks open the comfort of certainty, pushing reflection into motion. From this cognitive discomfort, I often felt a need to learn more, to act differently, to understand better, thus initiating a new cycle of inquiry.

In retrospect, I now see a connected pattern of transformation. Not a straight line from ignorance to enlightenment, but more intertwined forms of movement. Each shift built upon the last, layering insight upon insight, while also exposing new tensions and weak spots.

To make this inner process more tangible, I introduce a visual metaphor (Figure 3) that maps the entangled pathways of emotional and cognitive transformation. The image is based on a drawing created by one of my workshop participants and utilised with permission. It resonates deeply with the themes of this research and has been slightly adapted to illustrate the layered nature of cognitive reframing for sustainability. The image depicts a knotted, looping rhythm representing disruption, reflection, reframing and re-engagement.

At the foundation of the visual lies a yellow space I call the "transformation space." Eventually, this background will not depict a separate realm but will simply represent life itself. It is where human experience unfolds in all its complexity, through everyday moments, encounters, learning settings and the ordinary flow of time. But it can also contain once-in-a-lifetime adventures or more exceptional incidents. Within this space, I have added yellow knots. These knots symbolise dense, often tangled moments that have the potential to stir something within us, much like the shapeshifting incidents I describe. They stand for experiences that can provoke or gently nudge us out of our habitual ways of sensemaking and consequently act as openings for reframing (see Rein & Schon, 1996).

From these knots, two distinct yet interconnected pathways emerge. The pink paths represent emotional experiences. These are raw and sometimes messy responses that arise in the wake of shapeshifting encounters. They are signals that something matters. They stir our awareness and invite us to pay attention.

The green paths follow the loops of reflection. This is the process of making sense of what has been felt. It may happen immediately or unfold over time. Reflection helps us digest our experiences and understand them in context (Raelin, 2002). In a following step, they can even possibly shift how we view ourselves and the world (Woiwode et al., 2021).

The model, although not a fixed pathway, can be a space for exploration. Reframing is ongoing. It happens through entanglements of emotion, thought, resistance and openness. The visual is another invitation for you to pause and consider your own journey, to trace the knots that shook, shaped or shifted something in you.

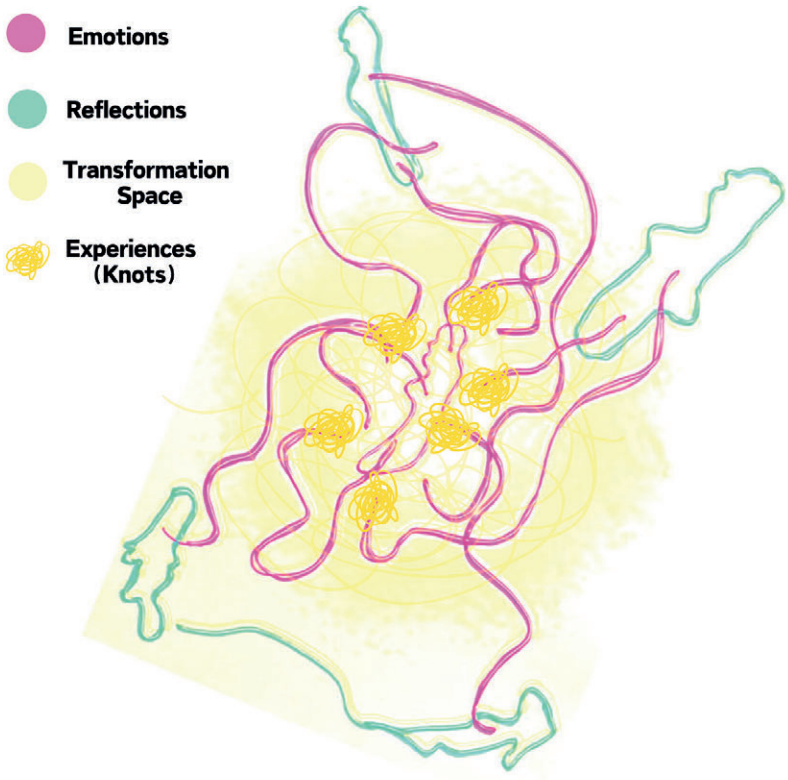


Figure 3: Entangled pathways of shapeshifting

More to (un-)learn

Limitations and practical implications

As with any autobiographical research, this work carries inherent limitations. My own positionality influences what I remember, emphasise, or leave out. While this subjectivity is integral to the method, it also raises concerns about bias and generalizability (Anteby, 2013). Moreover, my autobiographical voice emerges from access to reflective practices and the privilege to narrate my experiences, which overall limits the diversity of perspectives represented (Sjoberg & Kuhn, 1989).

As someone situated in high-income societies, I recognise that my cognitive frames are shaped by privilege and safety. My opportunity to study sustainability

is made possible by structures of access and stability that many do not share. This means I can only speak from a limited worldview. One that is always entangled with complicity. To me, this is about responsibility. The very fact that I can afford to ask, *What am I willing to sacrifice?* (see Update May 2025 in Table 1) already positions me differently in global systems of power.

Despite or particularly through these constraints, this account offers practical insights for educators, practitioners and organisations working at the intersection of sustainability and transformative learning in privileged contexts. It highlights the importance of creating spaces where emotional discomfort is welcomed as a meaningful entry point into reflection. In practice, this could mean integrating storytelling circles, emotion-mapping exercises or creative practices like drawing, movement or sound into leadership and (sustainability) education. These approaches invite our senses and whole human identities when facing sustainability transformations.

However, we need to keep in mind that such spaces require more than good intentions. They demand facilitators who are trained in fostering psychological safety. For me, this involves cultivating presence in facilitating spaces, meaning the capacity to be fully engaged (mentally, emotionally and relationally) with what arises. Spaces in which facilitators listen beyond words and stay grounded when discomfort surfaces.

Further, I would like to offer a set of suggestions, "Principles of Shapeshifting Support," outlined in Table 2. These principles are grounded in the lived insights of this article and aim to support personal transformation for sustainable development.

Finally, this work encourages a re-evaluation of what counts as valid knowledge, particularly in academia. By making room for first-person inquiry, we acknowledge lived experience to be a site of sensemaking with the potential to inform systemic change. For those seeking to bridge the "human gap" between knowledge and action, autobiographical insights may offer a valuable, if imperfect, compass.

Table 2. Principles for supporting individual shapeshifting

Principle	Description	Implication / Guidance
Emotional recognition	Transformation often begins with powerful emotions that signal inner dissonance.	Learn to notice and stay with emotional responses, acknowledging 'something' wants to be seen, heard, felt.
Reflective integration	Reflection connects emotion to inner transformation by offering space to digest and reframe.	Create regular moments for sense-making, both alone and in dialogue with others.
Disruption as entry	External triggers can challenge deep frames and open space for new understanding.	Seek diverse, unexpected stimuli (stories, art, experience) that provoke thought. Leave your social "bubble".
Relational anchoring	Role models, communities, or critical dialogues help ground inner transformation.	Surround yourself with people and practices that invite growth and tension. Again, leave your "bubble".

Echo - Conclusion

This article began with a silent SCREAM. An ache beneath the surface, a tension in between. Between knowing and not knowing, between movement and pause, between *shifting shapes*. I wrote these pages from that space. Not to solve, but to stay within.

What emerged is a series of circling movements of emotional ruptures and ongoing reflection. And through it all, a quiet thread of hope. Not the loud kind that promises resolution, but the grounded kind that asks us to keep trying, even when it hurts. Especially when it hurts.

If we want to foster reframing processes, we need spaces for discomfort. Spaces where emotions are not seen as distractions but as guideposts. Where contradictions are not silenced but explored. Sustainability transformations then become more than a cognitive exercise. Instead, they become a way of being we must wrestle with. Personally. Emotionally. Relationally. That work can't be outsourced or streamlined. It begins with us, where we are, with who we are.

If this article has done anything, I hope it invited you to trace your own knots. Because your story matters, too. Not despite its subjectivity, but because of it.

Our future is shaped by how we show up today.

There are no limits to hope. But hope is practice. Hope is work.

And if you're still reading, still caring, then maybe that's already a beginning.

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Biographies

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Chapter 3

Opening Mindsets by Many Means

There is a particular kind of stubbornness in the way we have come to think about learning. The crises facing humanity are not primarily problems of information. We have known enough about climate change, biodiversity loss and social fragmentation for long enough, and yet the dominant response of educational institutions has been to produce more information, delivered more efficiently, to more people. The assumption buried in this response is that the human gap, the distance between what we know and how we act, is a knowledge deficit: if people simply understood the severity of what is at stake, they would change. They have not. And the reason, increasingly acknowledged in both education research and systems thinking, is that the gap is not primarily cognitive. It is affective, relational, spiritual and imaginative, and no amount of additional information will close it if those dimensions remain untouched (Botkin et al., 1979).

This is not a counsel of despair. It is, on the contrary, one of the most hopeful realisations available to educators at this moment, because it reframes the problem entirely. If the obstacle to transformation is not a lack of knowledge but a poverty of imagination, a disconnection from meaning, a learnt helplessness in the face of complexity, then education has far more to offer than it has so far been asked to give. The question shifts from what students need to know to who they need to become and how they need to feel, towards the world, towards the future, towards their own capacity to act. This is education understood as what Freire and, later, bell hooks called a practice of freedom: the cultivation of a human being's capacity to read the world critically and act upon it with both courage and care (Freire, 1976; hooks, 1994). It is, at its root, a practice of hope.

The Report to the Club of Rome - *No Limits to Learning* identified this possibility nearly half a century ago, arguing that humanity's capacity to navigate its self-inflicted crises depended on developing new modes of learning that were anticipatory, participatory, integrative and innovative (Botkin et al., 1979). The report's animating conviction was that there are no limits to what human beings can learn, provided the conditions for that learning are genuinely created by being enacted in the relationships, methods, spaces and materials of actual educational experience. What the decades since have revealed is that those conditions are far more varied, and far more demanding, than a single pedagogical tradition or disciplinary framework can provide. Opening mindsets, it turns out, requires many means: art and music, place and land, story and ritual, play and craft, spiritual practice and embodied movement, co-creation and unlearning, silence and mourning. The case studies gathered in this chapter are evidence of exactly that variety and of what becomes possible when educators trust it.

The relationship between mindset and hope deserves particular attention here, because it is easy to misunderstand both. A mindset, in the sense this chapter uses the term, is a deeper orientation, a way of perceiving the relationship between self and world, between present and future, between individual action and collective possibility. Carol Dweck's foundational research established that the difference between a fixed and a growth mindset shapes not only what learners attempt but what they believe is worth attempting (Dweck, 2006). In the context of sustainability and ecological crisis, this distinction takes on existential weight: a learner who has internalised a fixed mindset about the future, i.e. who believes, consciously or not, that change is impossible, that their actions are insignificant, that the future is foreclosed, is not merely less effective as an agent of change; they are, in the deepest sense, cut off from hope. And as Ernst Bloch argued, hope is not a mood that descends on the fortunate; it is a cognitive and affective capacity that must be cultivated, practised and held against the evidence of the present (Bloch, 1986). Education that opens mindsets is, by this account, education that restores the learner's relationship to possibility and that is an education in hope.

What makes this restoration so difficult and what makes the case studies in this chapter so significant is that the dominant architecture of formal education works, often invisibly, against it. Systems built around measurable outcomes and standardised curricula are structurally ill equipped to cultivate what cannot be easily assessed: wonder, empathy, ecological identity, the capacity to sit with uncertainty, the willingness to imagine radically different futures. Gert Biesta's concept of "learnification" which he defines as the reduction of education to the production of learning outcomes, describes precisely the mechanism by which these deeper capacities get quietly evacuated from the institutional space (Biesta, 2010). What remains, once the outcomes have been specified and the assessments designed, is a thinned version of education that is competent at qualification and socialisation but largely silent on what Biesta calls subjectification: the formation of a person capable of independent thought, ethical commitment and genuine engagement with the open question of how to live. It is exactly this thinned version that the educators in this chapter are pushing against, each in their own way, with their own materials and methods and communities.

The methods they employ share a common logic, even where they share little else. Each, in some form, bypasses the purely cognitive channel through which mainstream education delivers its content, and reaches instead for what might be called the fuller register of human experience: the body, the senses, the emotions, the imagination, the spiritual, the relational. This is by no means anti-intellectual. Several of these

case studies are rigorous in their research design and theoretically sophisticated in their framing. It is rather a recognition that the intellect alone, severed from feeling and relationship and place, is not sufficient for the kind of learning that systemic transformation requires. The Club of Rome's The Fifth Element programme has made a similar observation, noting that the shift towards regenerative ways of being in the world cannot happen through rational consciousness alone and that initiatives aiming to restore our whole humanity, including what it describes as our relationship with the ineffable, are a necessary part of the path forward (Álvarez Pereira et al., 2025). The case studies in this chapter are, each in their own idiom, exactly such initiatives.

They also share a commitment to what The Fifth Element calls resonance and pollination: the idea that transformation at scale requires not the universal adoption of a single model but the proliferation of many locally rooted experiments that can find each other, learn from each other and together begin to shift the broader culture of education. This pluriversal logic of many pathways, many knowledge traditions, many ways of being in relationship with the world is itself a form of hope, because it refuses the paralysis that comes from waiting for a comprehensive solution and trusts instead in the generative power of diverse, committed, contextually grounded practice.

The nine case studies that follow embody this diversity with remarkable range. Le Grelle, Kennedy and DePorte of the Human Impacts Institute open the chapter by making the case that arts- and culture-based education offers something science communication alone cannot: the activation of social imagination, the cultivation of empathy and the forging of new relationships with place and community. Drawing on projects spanning mobile planting in Latin America, flood-line walking in New York and mourning practices of Marind communities, it argues that creative strategies are not supplementary to systemic change but central to it. Belchior, Domingues, da Silva, Marques and Günes document the Kaospilot Outpost semester in Lisbon. This three-month immersive experience is held as a living system rather than a programme and shows how education aligned with life's own principles of regeneration, reciprocity and nested interdependence can produce shifts in leadership understanding, ecological literacy and civic relationship that more conventional programmes cannot reach. Cetrangolo presents an emerging pedagogy called "systemic renewal." Developed over six years of participatory action research with leaders across eleven nations, the pedagogy builds from Franciscan pedagogy, restorative practice and narrative transformation to offer a ground-up, rather than top-down, methodology for institutional change, one that takes seriously the inner

dimensions of systemic renewal rather than treating them as incidental to structural dimensions.

Bracker and Land turn to UNESCO World Heritage Sites as living laboratories for transformative learning and argue that these places of deep time, cultural memory and ecological significance offer learners something no textbook can replicate: a direct, embodied encounter with the constructed nature of worldviews, and therefore with the possibility of constructing them differently. Bentz, Ristić Trajković, Šćekić and Tilinger address what many educators quietly know but rarely say aloud: that the tools and methods needed to teach regenerative futures are not yet widely available, and that most educators lack the guidance to go beyond the facts of crisis and into the territory of imagination and creative engagement. Their collaborative book project, drawing on 120 authors from 30 countries, is itself an act of hopeful collective sense-making, offering a practical resource for educators willing to make that crossing. Lettmann, Geaney and James investigate mindset transformation through place-based learning, co-creation and more-than-human perspectives in a sustainable fashion course at Falmouth University, showing how the deliberate unlearning of linear, designer-first approaches, built with and through feminist, regenerative and rhizomatic principles, opens students to systemic, community-embedded ways of designing that conventional design education forecloses.

Kobus, Klijsen-van Elteren and Raaphorst use planned obsolescence as a lens through which students at a Dutch university interrogate the logic of disposability embedded not only in consumer products but in education itself, developing a tabletop role-playing game as a vehicle for radical imagination and professional reinvention. Lyons and colleagues, working across the PLANET4B project, present a critical and inclusive online training course for biodiversity governance that draws on Donella Meadows's leverage points framework, adapted for intersectionality and situated power, and deploys participatory theatre, creative games and experiential methods to democratise knowledge and advance ecological justice, contributing directly to the No Limits to Hope ethos that grounds this volume. Finally, Wamsler, Ives, Woiwode and Walsh bring the inner life fully into view, examining the Zen and the Art of Saving the Planet online course to show how spirituality can mediate the creation of meaning, hope, agency and engagement across individual, collective and systemic levels, addressing what they identify as the deepest challenge of our time: the widespread illusion of our own insignificance.

Together, these nine contributions make a case that is both practical and philosophical: that the opening of mindsets is itself the change we are seeking and that education, understood in its fullest sense, is the most powerful means we

have of bringing it about. They do not offer a single method or a unified theory. They offer something more honest and more useful, a constellation of approaches, each rooted in its own place and tradition, each trusting in a different aspect of what it means to be human and each demonstrating that when education makes room for imagination, embodiment, relationship and the possibility of the future, hope does not need to be taught as a subject. It arises, as it always has, from the experience of learning itself.

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Transformative learning pathways through arts and culture-based approaches

Rosalie Le Grelle, Christopher Kennedy and Tara DePorte*

Abstract

Science communication has raised public awareness of climate change but has struggled to catalyse large-scale behavioural change or systemic reform. This paper argues that arts- and culture-based practices offer a transformative pathway towards systemic change by engaging affective, embodied and multispecies forms of learning. Drawing on projects like *Planton Móvil*, *HighWaterLine*, *Yo Prefiero el Lago* and the mourning practices of Marind communities, this article demonstrates how the arts — and culture-based education — activate social imagination, cultivate empathy and critical thinking and foster new relationships with place, land and community. In an era marked by ecological collapse, disinformation and social fragmentation, these creative strategies offer critical tools for rebuilding trust, shifting mindsets and forging sustainable futures.

Keywords: culture-based learning, arts education, systems change, alternative education, climate education, knowledge systems

Introduction: Revisiting *No Limits to Learning*

In a moment of compounding ecological crises, political polarisation and widespread distrust in science, conventional approaches to climate education are struggling to drive meaningful change (Monroe et al., 2017). While science communication has raised awareness, it often fails to inspire the action needed to

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address the complexity and urgency of current socio-environmental challenges (Moser, 2016). The 1979 report to the Club of Rome, *No Limits to Learning*, called for a paradigm shift in how societies learn, adapt and evolve in the face of global change (Botkin et al., 1979). Today, we revisit its central tenets through a new lens: the transformative potential of the arts and embodied learning to reframe environmental education, catalyse systemic change and build social and ecological resilience.

Drawing on case studies, field research and insights from the Human Impacts Institute's (HII)[1] Creative Climate Communication Lab (C3 Lab), we have identified three interlinked pathways through which arts- and culture-based practices can lead to environmental learning and action: 1) Embodied and experiential learning; 2) Reframing climate narratives through storytelling and imagination; and 3) Multispecies and the more-than-human world. These approaches challenge the epistemological dominance of Western science and create opportunities for pairing diverse forms of knowledge and experience to reimagine our relationships to place, self and each other.

Origins and founding context

Artists and culture bearers have been at the heart of social transformation. They help us imagine possibilities, inspire us to feel deeply, question the status quo and envision new futures. Through dance, song, storytelling, visual arts and ritual, creatives often carry and foster a community's history, hopes, imaginations and grief. Artists and culture bearers often connect us — across time, space and identity — to what we have inherited and what we risk losing, daring us to dream of what we can build.

The Human Impacts Institute was founded in 2010 in New York City, when collaboration between the arts and climate initiatives was rarely discussed. We understood that climate action is not just a technical, political or scientific challenge but a cultural one too. HII experiments with the *in–between* spaces between science and storytelling, activism and art, education and embodiment. We create spaces where artists, educators, environmental-justice leaders and communities can come together to co-create, experiment and reimagine what environmental leadership looks like. This is about making the movement more human, inclusive and resilient.

We are not alone in this work. A growing number of initiatives integrate arts and culture into climate- and environmental-justice efforts, building on a long-standing tradition of community-based organising rooted in the civil rights movement

1 https://www.humanimpactsinstitute.org/

(Bullard, 2018). In this context, informed by emerging research (Le Grelle et al., 2024) and 15 years of applied experience, HII began asking how arts- and culture-based work catalyses climate action, how its impacts can be meaningfully assessed and how such efforts might be strengthened and scaled.

Accordingly, research has become part of HII's function. We are now better equipped to understand the communities we support while ensuring our programmes are rooted in evidence-based understanding, challenging the notion that expertise only lives in labs or legislatures.

Building on this foundation of research and collaborative, practice-led inquiry, we, as advisors and researchers affiliated with the HII's C3 Lab, advocate for bridging "the human gap" — as described in the *No Limits to Learning* report — through educational policy and practices that:

- Recognise the limitations of conventional evaluation frameworks and support qualitative, affective and place-based metrics (locally relevant, site-specific, modifiable indicators).
- Sponsor and nourish respectful, impactful partnerships among artists, educators, scientists, environmental-justice organisations and communities.
- Validate traditional and Indigenous knowledge systems and community-based ways of knowing alongside Western scientific frameworks. This includes recognising and respecting Indigenous knowledge as living, dynamic and deeply empirical — that is, grounded in generations of observation, stewardship and relational ethics with land, water and non-human life.
- Adapt metrics to create space for emotional, multicultural and multispecies literacy as core learning outcomes.
- Engage creatives in harnessing art for environmental education to drive bold, effective climate action.

A fragmented world, driven by Western positivism and the attention economy

We live in a moment shaped by deep fragmentation — ecological, social and psychological. The accelerating climate crisis is not only a material emergency but also a crisis of imagination, empathy and relationality. While greenhouse gas emissions surge and biodiversity collapses, we are also faced with eroded trust in scientific authority, intensifying hyper-partisanship and a growing emotional disconnection from environmental realities. This *polycrisis* is complex, driven by the convergence of numerous wicked problems (Head, 2025; Kwamie et al., 2024;

Lawrence et al., 2024). As the *No Limits to Learning* report addresses, "the human gap" in our understanding, is the reality that a significant portion of humanity has not learnt to engage with complexity, or more precisely, has not learnt to hold it. This incapacity is driven by social media, artificial intelligence, extensive lobbying and misinformation campaigns by corporations, and the pressures of a relentless attention economy (Farrell at al., 2019; Menczer & Hill, 2020). These forces have weakened our collective ability to sit with the complexity and ambiguity that life inherently entails. Concurrently, much of the disconnection fuelling environmental degradation stems from a perceived separation between humans and nature, a dualism embedded in Western models of education (Betz & Coley, 2021), urban development and extractive economies. This challenges how we communicate and address environmental issues, as well as how we leverage ways of knowing, learning and applying pedagogical tools effectively.

In such a context, education must grapple with more than just knowledge transmission. It must address the need for emotional resilience, critical reflection, as well as social and more-than-human connection. Yet dominant educational paradigms, which have been shaped by Western positivism, privilege abstraction, detachment and quantification — standardised tests, surveys and metrics — while devaluing experiential forms of knowing. This not only limits the types of knowledge recognised as valid; it also hinders our capacity to build empathy, imagination and critical reflection, qualities essential for engaging with complex, uncertain futures.

The attention economy has strained our collective capacity to focus, reflect and care. This erosion of attentional and emotional bandwidth (de la Torre et al., 2025; Manzerolle, 2014) undermines civic life and hampers our ability to confront long-term environmental crises. In this light, art and culture emerge, not as luxuries but as urgent pedagogical tools for mending fractured relationships between humans and nature, individuals and communities, and knowledge and action.

Artistic and cultural approaches to learning do not sidestep science; they help us contextualise it within a broader ecology of beliefs, identities and cultural norms (Kennedy et al., 2023). These approaches remind us that learning is not merely the accumulation of knowledge; it is a relational act rooted in curiosity, care and shared experience. These concepts are not new. Many communities and cultures centre culture- and place-based learning. Many Indigenous communities and First Nations have deep-seated knowledge and belief systems based on human-nature interconnectedness, listening and collaboration (Johnson, 2012; Yemini et al., 2025). They call on us to engage with learning as an ethical and ecological practice grounded

in respect and reciprocity.

The integration of these ways of learning into comprehensive educational models has not been achieved. Even in contexts in which policies have been introduced to incorporate more culturally grounded approaches — such as in Peru, where intercultural bilingual education (IBE) is recognised as a fundamental right of Indigenous communities under General Education Law No. 28044 (MINEDU, 2003) and further operationalised through the Ministry's pedagogical proposal for quality IBE (MINEDU, 2013; World Bank, 2022) — the results remain limited. Under IBE, Indigenous communities' native languages and connected cultural systems are integrated into formal education, but they often fail to embody a respect for Indigenous worldviews (Lopèz, 2014; Cortina, 2014; Hidalgo Collazos & Ordoñez Hidalgo, 2025).

As Carlos Deivis Lozano Suárez, an HII board member and young Kichwa leader from Peru, shared, culture-based contextualisation in learning often remains superficial in the Sinchi Runa community of Llucanayacu. Although Quechua is taught, education is largely detached from its cultural and spiritual meanings. This account illustrates how IBE is frequently reduced to linguistic accommodation (Lopèz, 2014; Cortina, 2014). It exemplifies how many state-sanctioned education systems reproduce monocultural practices under intercultural labels. As Hornberger (2000) argues, this reflects not only implementation failure but also the deeper unsustainability of accommodating plural knowledge systems within Western-standardised educational models. In response, HII explores how arts- and culture-based educational practices can catalyse the transformational, systemic changes needed to address the socio-ecological crisis.

The limits of climate communication and the transformative power of arts and culture

Over the past few decades, science communication has been key in raising public awareness about climate change (Leiserowitz et al., 2024). However, even in parts of the world in which climate literacy is high, we have not seen widespread climate action, large-scale behaviour change or systemic reform. This suggests that, in the context of climate change, providing information does not necessarily lead to meaningful action (Moser & Dilling, 2011).

This well-documented issue has prompted extensive research on the barriers to action in the fields of behavioural sciences. HII's 2024 literature review[2] suggests that

2 https://www.humanimpactsinstitute.org/_files/ugd/677366_caf92520348d433fa7852f0f5ef26437.pdf

widespread climate communication models have focused too heavily on cognitive processes (Moser & Dilling, 2011). Recent studies, particularly in the field of climate-change communications, highlight the vital role emotions play in driving behavioural change (Kollmuss & Agyeman, 2002; Feldman & Hart, 2016; Ojala, 2015; Gregersen et al., 2023). Simply put, for a change in behaviour, people need not only understand the information but also feel its impact personally.

Measuring exactly how emotions impact climate engagement is difficult, requiring surveys and data over a prolonged period. Moreover, emotions are nuanced, making them difficult, if not impossible, to categorise and measure. In fact, HII's literature review is inconclusive about which emotional triggers are most effective in inciting climate action. We can, however, more confidently conclude that we are moved by our emotions, our geographical space and our collective and individual values and beliefs.

Most relevant to this article is the emotional dimension needed to bridge the gap between awareness and action. It is widely known that arts and culture have the capacity to evoke emotions (Sommer & Klöckner, 2021). Although the meaning of art remains a philosophical question, it can be argued — following Duncombe (2016, 2024) — that a central function of art is precisely to elicit emotion; many say it excels in doing so.

The field of *artistic activism* exemplifies this power of the arts, viewing social change as both a cognitive process and an emotional one (Shank, 2004). While politics often aim to guide cognitive learning processes without adequately addressing the emotional dimension, the arts tend to do the opposite. Ultimately, both domains fall short in mobilising the full spectrum of forces necessary for transformative change. But artistic artivism operates in two intertwined realms: the material world, through direct action, and the affective world, through aesthetic practices that provoke emotional responses.

Research has shown that for individuals to engage in meaningful behavioural change, affective and embodied learning are essential complements to scientific knowledge (Shank, 2004). Artistic activism echoes these insights by demonstrating that social change can be pursued through emotional, symbolic and experiential dimensions. Viewing emotional engagement in climate action as a learning process — one that responds to what Botkin et al. (1979) call "the human gap" — clarifies how emotions shape our capacity to change. The 1979 report *No Limits to Learning* demonstrated that learning, at its core, is about *change*. Accordingly, "the human gap" is fundamentally a gap in our capacity to change and adapt, not merely a barrier to knowledge.

It is in this space that "transformative learning" becomes relevant. Mezirow (1997) describes transformative learning as bringing about change in "frames of references" through critical thinking. It involves both cognitive and emotional processes, and it reframes learning — not as the passive assimilation of information but as a process of personal transformation. This process is invoked when knowing is experienced in ways that transform oneself and one's environment. Learning with and through arts and culture can then mean engaging the whole self — emotionally, cognitively, relationally and experientially — towards deeper understanding and sustained change.

Despite a growing recognition of the power of arts and culture in education (Bentz & O'Brian, 2019; Bentz, 2020), their role in driving systemic climate action remains underleveraged. In practice, artistic climate work is often seen as supplementary, not foundational. As a result, creative and culturally relevant ways of knowing are marginalised in educational policy and practice (Deverell & Moore, 2014). Similar to art classes in schools, these disciplines are difficult to quantify and monitor. This results in a struggle to gain institutional legitimacy, despite the known profundity of impact the arts and culture have on learners' worldviews, capacities and commitments (Belfiore & Bennett, 2007; Duncombe, 2016; The Culture Group, 2014). Even when enshrined in policy, as the IBE example demonstrated above, it is not seen in practice.

Through the below case studies, we demonstrate that artistic and cultural practices offer vital modes of learning that transcend silos. Drawing on Indigenous epistemologies and multispecies frameworks, we reiterate the crucial role of arts and culture in both communicating scientific facts and cultivating the inner conditions — emotional, ethical and imaginative — that make those facts matter.

Transformative learning pathways through art and culture

Transformative Pathway 1: Embodied and experiential learning

Embodied learning emphasises the role of the body, senses and physical presence in shaping knowledge. In contrast to abstract, text-based education, experiential practices root participants in the here and now, offering visceral experiences that create deeper connections to place, self and community.

The participatory artwork *Planton Móvil*[3] (Monge, 2018) by Peruvian-born artist Lucia Monge exemplifies this pathway. Originally launched in Lima, Peru — a city challenged by water scarcity, poor air quality and an inequitable distribution of green

3https://luciamonge.com/works/planton-movil

space — *Planton Móvil* plays with the Spanish double meaning of *plantón*, which refers both to a sapling and a peaceful protest. In each iteration of the project, Monge invites participants to join in a "walking forest," carrying potted plants through city streets to make visible the importance of urban vegetation and advocate for more just and verdant public spaces (Figure 1). Each procession ends with a communal planting event, transforming performance into direct ecological intervention.



Figure 1: Lucia Monge's Plantón Móvil (2011). Photographer: Jorge Ochoa.

Monge positions her work as an act of multispecies solidarity (Monge, 2018). By "moving with" plants, participants reimagine movement and migration not only as human experiences but as shared processes involving vegetal life and centre plants as conduits for cultural memory and community cohesion. The project's adaptability allowed it to grow across cities and continents. In this sense, *Planton Móvil* used sensory immersion, disruption of urban routines and inclusive participation to engage communities in shared experience and urban ecological care.

Embodied and somatic forms of engagement, such as the *Planton Móvil* project, help participants connect emotionally and physically to climate impacts, making these threats more tangible. These methods help overcome the psychological distance

that often separates people from environmental risks and have been shown to increase affective engagement and memory retention, essential precursors to action (Vega & Schläpfer-Miller, 2021; Fors et al., 2013; Marder, 2015; Kennedy et al., 2023).

Transformative pathway 2: Reframing climate narratives through storytelling and imagination

Conventional climate discourse often emphasises disaster and data, which can lead to paralysis rather than action, especially among young people (Ojala, 2012). Artistic and narrative-based practices offer a different approach — they humanise scientific information and imagine alternative futures.

Eve Mosher's *HighWaterLine*[4] (McMillen et al., 2016) transformed abstract projections of sea-level rise into a participatory storytelling initiative. In 2007, Mosher marked nearly 70 miles of NYC sidewalks with a blue chalk line denoting where the water would reach with 10-foot sea level rise (Figure 2). As she walked, she handed out flyers, answered questions and gathered stories — effectively turning her solo performance into a catalyst for community dialogue. Her work visualised otherwise invisible climate risks, creating new pathways for understanding and action.

What distinguished *HighWaterLine* was not just the performative act of chalking a line but the personal and spontaneous interactions that arose. Residents shared stories of previous storms, anxieties about future flooding and frustrations about being excluded from formal climate planning. In South Brooklyn, Mosher met homeowners who had been denied flood insurance with little explanation. Her presence — marking their streets — generated a powerful, emotional reckoning with their precarious situation. These interactions made climate risk personal and exposed that risk is rooted in specific geographies, histories and social injustices. The *HighWaterLine* model has since been adapted by communities in Miami, Bristol, Philadelphia and beyond (Nadir, 2015).

4https://www.evemosher.com/highwaterline



Figure 2: Eve Mosher. Left, Eve Mosher performing HighWaterLine in New York City, 2014; right, Mosher performing HighWaterLine in Miami, FL. Photographer: Eve Mosher.

The campaign *Yo Prefiero el Lago*[5] (The Rules et al., 2019) to save Mexico's Lake Texcoco — a once-thriving and complex ecosystem shaped by the Mexica (Aztecs) — illustrates how artistic and narrative-based practices can open new ways of imagining alternative futures by humanising environmental struggle.

5 https://youtu.be/Z1drhgCv8zM?si=8T2PdyYqpQf3SGve

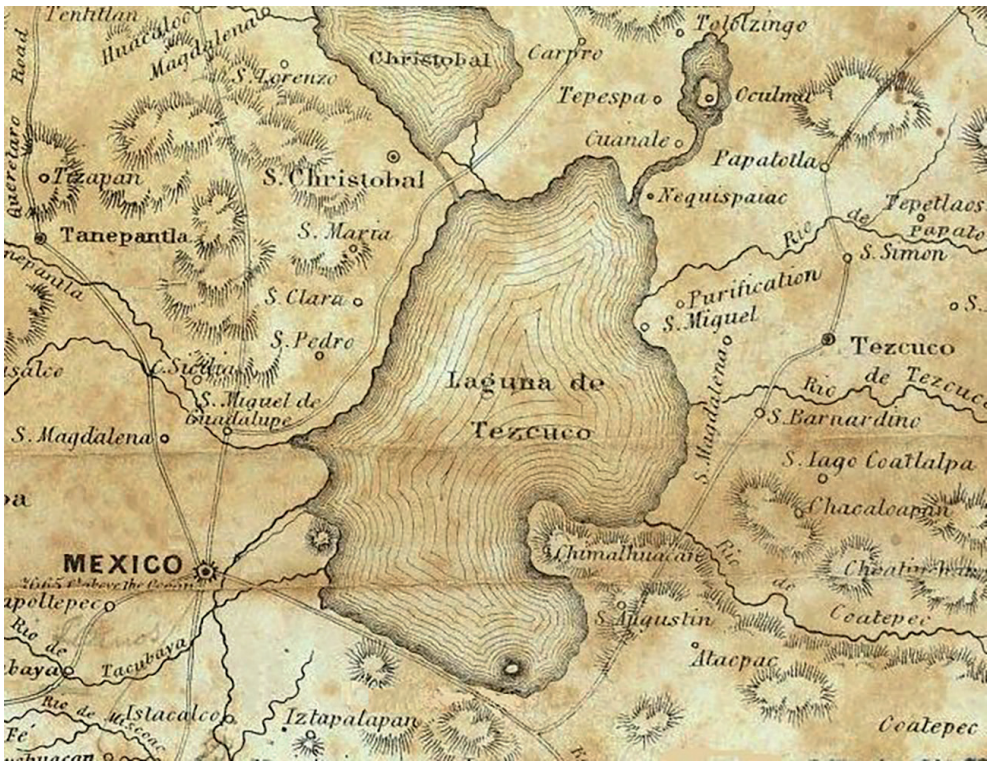


Figure 3: 1847 diagram of the ancient bed and canal system of Lake Texcoco (Laguna de Tezcuco). Bruff/Disturnell diagram, 1847 (Public Domain). Wikimedia Commons.

In San Salvador Atenco, a community on the bed of Lake Texcoco (Figure 3) resisted mass displacement caused by plans for a new international airport. This was a grassroots struggle led by the People's Front in Defense of Land and by people with a deep cultural connection to the lake, a water body that had been central to development of civilisations for thousands of years (Environmental Justice Atlas, n.d.).

A pivotal moment came with the "Letter of the Lake," a poetic work that personified Lake Texcoco as a living entity and mourning its loss. The debate was no longer just a location or a resource; the lake became a living being with memory, rights and agency. This shift inspired the campaign *Yo Prefiero el Lago* ("I Prefer the Lake"), which invited people across the country to choose between asphalt and water, between a short-term project and a living watershed (Culture Hack Labs, 2025). The campaign sparked a wave of artistic and cultural responses — musicians composed songs, artists staged installations and poets gave voice to grief over the lake's

destruction, translating environmental knowledge into shared emotional expression. When the 2018 referendum resulted in 70% of voters rejecting the airport (Deutsche Welle, 2018), it signalled not only a political victory but also the power of narrative imagination in reorienting climate action towards possibility and care.

Both projects demonstrate the transformative potential of aesthetic and narrative experience in fostering environmental and climate literacy, cultural heritage and social cohesion through future visioning. They embody meaningful storytelling — including by inviting people to become part of the story. Their use of metaphor (the line), emotional connection (the lake as living entity) and collective imagination transforms technical data into shared meaning, building social momentum for concrete actions with direct socio-ecological impact.

Transformative Pathway 3: Multispecies and more–than–human pedagogies

To truly shift environmental consciousness, education must go beyond anthropocentrism. Multispecies studies acknowledge the agency and intelligence of plants, non-human animals and ecological systems, inviting learners to recognise the profound interdependence of all life forms and the mutual entanglement of our health and survival (van Dooren et al., 2016).

Multispecies mourning among Marind communities in West Papua's oil palm frontier, as detailed through Sophie Chao's ethnographic fieldwork (2020, 2023), exemplifies this approach. Facing monocrop expansion that brings massive biodiversity loss, ecosystem pollution and exploitative land grabs targeting Marind bodies and territories alike, Chao documents plural forms of resistance. This includes three culturally rooted grieving practices: weaving sago palm leaf bags, singing laments over roadkill and transplanting bamboo shoots to mourn ecosystem devastation while actively reclaiming space (Figure 4) (Chao, 2023).



Figure 4: "Land for Aiwat, not for oil palm." Indigenous land rights activists reclaim their customary territories with plants and placards. Photographer: Sophie Chao.

In these community rituals, plants become co-educators and kin: Sago leaves absorb tears and impart textures of resilience through collective weaving, and bamboo demarcates living boundaries against plantation violence, fostering plant-human solidarity. Grief here enables transformative learning, as plants' agency reveals adaptive intelligence amid colonial disruption, turning sorrow into relational care that honours vegetal resilience and ecological roles (Chao, 2020, 2023). This learning is also evident in the Marind's shifting relationship with bamboo: once rejected as a symbol of domestication, it is now embraced as a resilient ally reflecting their own endurance. This shift underscores the legitimacy of place-based, culturally grounded knowledge in supporting local perspectives about ecological restoration, which are often more effective than purely scientific planting initiatives (Dawson et al., 2024a, 2024b).

These practices align with many Indigenous and relational worldviews which suggest that education should position nature not as a passive object of study but as a teacher, collaborator and kin (Lees & Bang, 2023). Understanding "plants as teachers" forms a major thread across numerous cultures (Irons, 2021), including those embedded in shamanistic rituals (Luna, 1984, 2010). The first-hand accounts of Carlos Deivis Lozano Suárez further illuminate the latter. He recounts how his grandparents taught through daily work, conversation and singing in Quechua, while

the forest and its plant spirits instructed through direct experience and dreams. For example, Llanchama[6] manifests as a healing figure who rubs the body and reveals anatomical knowledge to aspiring healers through traditional *dietas* and plant prerogatives.



Figure 5: Intergenerational multispecies teachings of the Kichwa community. Photographer: Carlos Deivis Lozano Suárez.

These rituals blur grief, pedagogy and resistance, offering relational tools for engaging more-than-human kin in critical, pluriversal ways. This form of learning, based in relational ways of knowing, has great potential for supporting a more comprehensive understanding of both the complexities of climate change impacts and the systemic changes needed to address their full impact.

6 Llanchama refers to the inner bark of Couratari guianensis Aubl. (Lecythidaceae), also known as Amburaya, a large Amazonian tree (Martínez & Gonzáles, 2022).

Discussion and implications for educators and policy: towards a new paradigm of environmental education

These models of transformative learning are a crucial approach to equip humanity with tools to respond intentionally, critically and ethically to the immense changes humanity has brought into being — or as Donna Haraway puts it, to be "response–able" (2016). Moreover, these transformative pathways are aligned with the broader aspirations for systemic transformation articulated in the No Limits to Hope project. Indeed, climate change, eroded trust in science, hyper-partisanship and emotional detachment from environmental realities demand systemic responses. Meaningful systemic change requires addressing underlying structures, patterns and mental models — especially deeply held assumptions and beliefs (Meadows, 2008). However, transforming these foundational paradigms is challenging precisely because they are embedded in identities and cultural norms resistant to change. By using artistic practices to foster embodied, imaginative and relational forms of engagement, learners can increase critical reflection and potentially revise their frames of reference.

Importantly, we frame the relationship among the three pathways as distinct yet ontologically intertwined modes of participatory learning:

- *Embodied pathways* are grounded in lived experience and draw on kinaesthetic learning; on these pathways the body is a site of cognition, and sensory, emotional and somatic experience are co-constitutive of how learners relate to environmental phenomena (Palmieri et al., 2025).
- *Narrative pathways* help make embodied and multispecies encounters understandable and shareable across communities by placing them within shared cultural, temporal and ethical frames, enabling learners to make meaning of environmental encounters and to articulate relational experiences; and
- *Multispecies pathways* challenge anthropocentric worldviews by shifting learning towards relational ethics and stewardship. They extend embodied and narrative learning beyond the human by recognising non-human agency and intra-species interactions, supporting modes of relationality that destabilise human exceptionalism (Riley et al., 2024)

As illustrated in Table 1, these pathways can be put into practice through a wide range of methods across education, policy, community action and other learning contexts. It is through their combined use and interconnection that they help move learners from awareness to participation, from individual concern to collective responsibility and from short-term engagement to sustained commitment.

Table 1. Translating arts-based environmental learning into action

Transformative approach	**Application in education**	**Application in policy/ governance**	**Application in community action**
Experiential and embodied learning Engage the body to foster ecological awareness.	Integrate movement, sensory experience and somatic reflection into climate curricula (e.g. breathing with plants, walking meditations).	Recognise and fund place-based programmes as valid modes of engagement in resilience and health policy.	Host embodied experiences in local parks (e.g. forest bathing, walking tours) that connect residents to place.
Storytelling and imagination Use narrative to shape emotional connection and shared meaning.	Compliment curricula with hopeful and personalised storytelling projects that connect students' lived experience to climate change.	Include narrative data in community resilience plans (e.g. oral histories, memory mapping).	Train local artists and youth to collect climate stories and amplify under-represented voices. Use arts-based facilitation methods in public
Multispecies perspectives Learn with and from non-human actors (e.g. plants, animals, rivers).	Encourage curriculum that treats land, water and species as co-teachers or subjects. Integrate lesson plans that seek multispecies kinship and co-learning.	Design multispecies-inclusive policies that take into account the needs and affordances of non-human actors and consider co-benefits (e.g. bird-friendly infrastructure, wetland restoration).	Invite community observation and stewardship of local ecologies, even those considered "vacant" or damaged (e.g. seasonal phenology walks, soundscapes).

Creative co-production centre collaborative creation between artists, scientists and communities.	Develop interdisciplinary labs that bridge science and art in classroom projects.	Allocate arts funding within environmental and infrastructure budgets.	Launch neighbourhood residencies pairing artists with local NGOs or environmental groups.

Note: Table made by authors in June 2025.

A key challenge remains in how to assess these pathways. Common metrics are rigid and suited for conventional education, leaving little room for the experiential and relational dimensions of arts- and culture-based approaches. Arts-based climate education calls for plural, reflexive approaches of assessment grounded in embodied, relational and critical methodologies.

For example, indicators of social resilience may be observed through enduring social ties, increased mutual support or enhanced collective capacity to respond to environmental stressors, documented through ethnographic observation, social network mapping, or facilitated community dialogues over time (McMillen et al., 2016). Growth in critical thinking and the capacity to engage with ambiguity may be reflected in how participants articulate complex trade-offs, question dominant narratives, or co-develop alternative futures through participatory visioning processes. Stewardship outcomes may be evidenced through changes in everyday practices, care for shared spaces and multispecies awareness. Rather than seeking universal indicators, participants draw on critical, feminist, Indigenous and multispecies studies that emphasise situated knowledge, relational accountability and ethical engagement with more-than-human worlds (Münster & Locke, 2015; Swanson, 2017).

We do not claim that this contribution to the No Limits to Hope initiative offers groundbreaking solutions to bridging "the human gap." Instead we offer a doorway to reaching beyond the status quo and to reshaping environmental learning through creativity, culture and community connection. The value of arts and culture in environmental education is well documented (Bentz & O'Brian, 2019; Bentz, 2020; Palmieri et al., 2025), yet such approaches are often add-ons or beautification tools and rarely achieve large-scale application. In order to truly transform systems, we need to ground our educational approaches in the myriad complex connections that are reflective of those systems. And we need arts and culture to help us internalise that complexity, mourn the losses, dream of the possibilities and move us towards collective accountability and action. This work is not an endpoint, it is an invitation

to artists, policymakers, educators, community leaders, researchers, elders, youth and so many more to co-create with us.

Conclusion: Reclaiming hope through creative praxis

In this article, we propose transformative learning pathways from a perspective that is not only research-driven but also fundamentally practice-led. Our vantage point compels us to advocate for educational policies and practices that recognise arts and culture as urgent pedagogical tools — tools essential for mending fractured relationships between humans and nature, individuals and communities, and knowledge and action.

The approaches offer more than critique; they create spaces for social imagination, relational repair and the cultivation of empathy and critical thinking. In an era defined by ecological uncertainty, oversaturation in our access to information (and misinformation) and social fragmentation, these creative strategies are necessities that provide us with the potential to reclaim learning as a deeply human, creative and ecological act. Revisiting the ethos of *No Limits to Learning* through the lens of No Limits to Hope thus means to reimagine not only what we teach, but how we transform the deep-rooted paradigms inhibiting us.

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Regenerating education through a living systems approach to place, process and partnership: a case study from Lisbon

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Abstract

In 2024, Kaospilot's Outpost semester in Lisbon became a living case of pedagogical innovation grounded in living systems thinking and regenerative development. Co-designed with the Portuguese cooperative LÚCIDA, this three-month immersive educational experience explored how learning environments might be intentionally designed to regenerate people, partnerships and places while responding to the systemic crises of our time.

Guided by an implicit theory of change, the Outpost was held as a living system rather than a temporary programme. It was designed to operate simultaneously at three interrelated levels: individual inner development, collective self-organisation and reciprocal engagement with Lisbon as a socio-ecological living system. Drawing on regenerative development principles, the Outpost was re-envisioned through three nodal design shifts: from connected parts to nested wholes, from project-focused to place-oriented learning, and from problem-solving to potential activation.

This article examines how these design choices shaped learning processes and outcomes. Student reflections and project narratives reveal shifts in leadership understanding, context awareness, intercultural humility and regenerative literacy. Beyond the student cohort, emerging changes in local collaboration patterns point

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to wider civic and institutional effects, particularly in the Lisbon neighbourhood of Penha de França.

The Kaospilot Lisbon Outpost case presents a situated learning process, which can offer guidance and inspiration; it is not presented to be replicated. It illustrates how education aligned with life's principles can foster anticipatory, participatory and integrative learning, contributing to the kind of transformative learning envisioned in *No Limits to Learning* and renewed through No Limits to Hope.

Keywords: regenerative education, living systems thinking, place-based learning, transformative learning, systems change, regenerative development

Introduction

No Limits to Hope calls for a radical reimagining of learning as a means to navigate, and respond to the systemic crises that define our times. But how might we design learning experiences that do not only transfer knowledge or develop skills but that regenerate people, partners and places as learning happens?

The 2024 Kaospilot Outpost in Lisbon attempted to explore that question. Framed through a living systems lens and co-designed with a local partner — LÚCIDA, this international semester invited students to immerse themselves in a new city, engage with the local living dynamic and develop their capacities as change-makers through relationships rooted in a growing increased consciousness about place, potential and the process of learning.

This article documents the core educational process underpinning the 2024 Kaospilot Lisbon Outpost. It is guided by an implicit theory of change rooted in living systems thinking. We hypothesised that if the Outpost were designed and held as a living system — rather than as a temporary programme — learning would operate at deeper levels than what skills acquisition alone could offer. By working simultaneously at the level of individual inner development, collective self-organisation and reciprocal engagement with place, we sought to create the conditions for regenerative learning to emerge. In this way, the Outpost can be understood as a practical response to the call in *No Limits to Learning* and No Limits to Hope for anticipatory, participatory and integrative learning capable of bridging the human gap between our capacity to act and our capacity to understand the consequences of our actions.

Background and methodological context

Kaospilot is a globally recognised school based in Aarhus, Denmark, that specialises in providing impactful education in leadership and entrepreneurship geared towards advancing regenerative futures. The education is focused on developing leaders by empowering people to shape the future with an emphasis on team-based learning, experiential pedagogy ("learning by doing") and real-world engagement through project partnerships. In the third semester of Kaospilot's flagship three-year programme — Kaospilot Education — a team of up to 38 students mostly in their early 20s relocates abroad for an "outpost" — a self-managed, place-based learning experience in a new cultural context.

A core aspect of the Kaospilot Education learning process is that students work in different project constellations, which range from individual to group to team-wide constellations, aiming for three levels of work — individual, collective and systemic. By working with many projects at the same time, on different levels and in a non-linear setting, students develop their abilities to multitask, organise and navigate in a complex world. The Outpost aims pertain to the three levels of work: for students to practice their own unique craft as enterprising leaders in an unfamiliar context, to collectively self-organise and collaborate and to co-create value with locals.

In 2024, the Outpost took place in Lisbon. Kaospilot partnered with LÚCIDA, a Portuguese cooperative working on systemic change, regenerative development and civic transformation to co-design and support the Outpost. The distinctive goal of this partnership was to unearth new potential for the Outpost to deliver systemic value — for the students as individuals, for the student team and for Lisbon — in a mutually beneficial way and thus keep it from becoming a merely temporary exploration of the same curriculum in a different country.

We engaged with the Outpost from a regenerative development and design approach, based on the Regenesis Group and Carol Sanford's lineage work, which is further articulated in Mang & Haggard (2016) and Gorissen et al. (2024). This is a body of knowledge and practice that draws on epistemological foundations from both Indigenous and contemporary systems science to inform ways of thinking, learning and designing that are aligned with how living systems evolve. By Indigenous science, we are not referring to specific cultural practices but to a family of knowledge systems developed by Indigenous peoples through long-term, place-based relationships with living systems. As articulated in regenerative development literature, these knowledge traditions are characterised by relational ontologies, circular causality and an understanding of humans as participants embedded within

ecological and social systems rather than as external managers (Gorissen et al., 2024). As such, the underlying logic of Indigenous science that prioritises place, reciprocity and nestedness was core to the Lisbon Outpost.

Lisbon offered a particularly resonant context for exploring a regenerative approach to learning in times of polycrisis — the simultaneous convergence of climate extremes, geopolitical fragmentation and socio-economic inequality that defines the contemporary global era. Like many cities globally, Lisbon is experiencing the localised effects of planetary dynamics such as climate change, with increased volatility in weather patterns; social inequality intensified by the city's development, speculative real-estate capital and mass-tourism; and civic strain as communities navigate resulting rapid economic and cultural change amidst an increasingly polarised political landscape. These dynamics are activating civic mobilisations and experiments with alternative urban futures based on solidarity and self-management, which are contesting the dominant market-driven narratives. For the Outpost, this made the city a fertile ground from which students could experience global challenges as lived realities and learn to engage complexity through place-based, relational and regenerative practice.

From a regenerative development perspective, planetary crises are understood not as isolated failures of policy or technology, but as symptoms of deeper patterns of fragmentation in how humans design, govern, and learn within living systems. Climate change, social inequality and ecological degradation emerge from the same underlying logic: treating complex, interdependent systems as controllable, extractable and external to humans. By working simultaneously on inner transformation and systemic engagement, regenerative education seeks to address these root causes. The Lisbon Outpost thus functioned as a micro-scale experiment in cultivating the kinds of learning processes capable of responding to planetary challenges at their source — mindsets, values and patterns of relationships.

Nodal interventions in the Outpost design

A key starting point for a regenerative approach to any project design is to ask, "How should we be thinking about this project?" so that it aligns with living systems principles. Such inquiry allows us to work with nodal interventions based on the premise that small conscious and conscientious interventions in the right place can create beneficial effects, across systems and up and down scales. As such, we didn't redesign the pedagogical architecture of the Outpost. We re-envisioned it through three distinctive mental processes aligned with the first principles of living systems

thinking (Sanford, 2022): "from connected parts to nested wholes," "from project-focussed to place-oriented," "from problem-solving to potential-activation." These shifts in perspective and some of their implications for the Outpost are further articulated below. They are presented separately for enhanced clarity but their effects in the Outpost design and impact intertwine and overlap.

From connected parts to nested wholes

By reframing the Outpost as a nested whole, rather than as a set of parallel learning activities, students were able to situate individual development within collective and systemic patterns. Bringing the individual students together with the student team, Lisbon, and Kaospilot as co-entangled elements on an evolutionary journey allowed for the Outpost to be seen as a nested whole. This way of seeing the Outpost enabled learning to move beyond self-improvement towards responsibility and contribution within a living system, a core condition for bridging the human gap between action and systemic consequence.

In practice this meant we started by seeing the 2024 Outpost semester nested within a three-year educational journey, within a particular time in Kaospilot's as an institution lifecycle, which was at the time reviewing its strategy for 2025–2027. We asked questions such as, "How can this particular Outpost uniquely serve the particular cohort of Team 30 in their three-year learning journey? Where were the students in Team 30 coming from (second semester) and where were they going afterwards (fourth semester)? How could the Outpost support each student's ability to do change, to be a change-maker and to attune to what their contexts are calling for? And how could the Outpost experience nurture Kaospilot's collective intelligence so that it can provide transformative leadership education?"

We then focused on making Kaospilot's three learning system levels more specific to the 2024 Outpost edition (Figure 1a and 1b). By holding together as a nested-whole the individual student in Team 30, Team 30 as the collective and Lisbon as the larger system, we defined a pedagogical architecture that allowed thirty-three students in Team 30 to engage in seven partner projects as smaller teams of four, one neighbourhood-wide initiative and multiple reflective and developmental processes (further elaborated in the next section) that weaved together the other foundational practices of the semester — sociocracy and adaptive leadership — as supportive and connective matrixes of Team 30's self-organisation and vitality. This framing allowed for deeper reflection throughout the Outpost semester as students were invited to track their own development as part of a larger pattern of change.

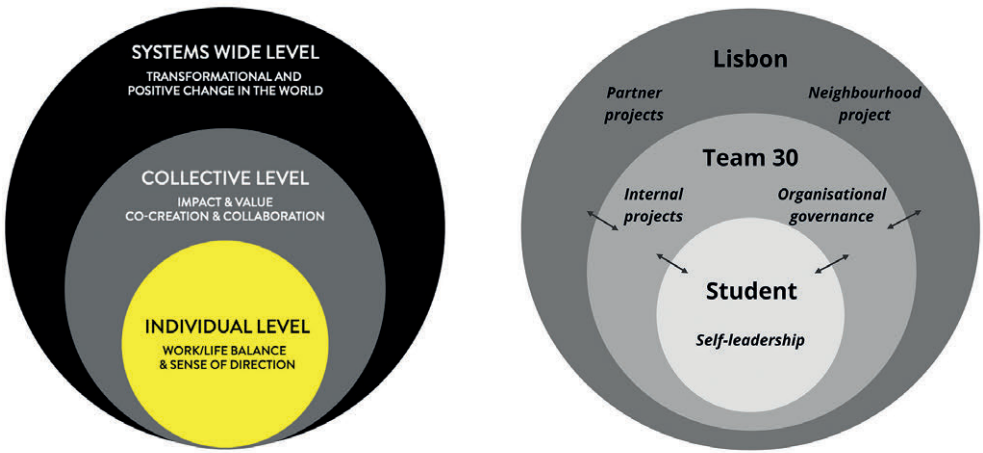


Figure 1a (left): Kaospilot Generic Learning System: 3 levels of work; Figure 1b (right): 2024 Lisbon Outpost specific learning system

From project-focused to place-oriented

This shift altered the learning dynamic from transactional engagement to reciprocal participation with place. As students related to Lisbon as a co-evolving system rather than a project site, they developed greater humility, contextual intelligence and care — capacities essential for anticipatory and participatory learning.

Shifting from project-focused to place-oriented meant starting by questioning the nature of the relationships between the student's presence and collaborations in Lisbon. We asked ourselves what is the right kind of relationship for temporary educational initiatives — such as the Outpost or other international student programmes — to cultivate with a new community? Often, these relationships are framed such that the host place provides infrastructure, inspiration and cultural experience, while the students bring economic activity or social projects in return. The exchange is mostly centred on the needs of and benefits of the visiting learners. Seen through a reciprocal lens, the visiting learners see themselves as temporary participants in a living system. This means the host place is as much a learning resource as it is a co-educator and co-beneficiary, with its own essence and potential that needs to be discovered and enhanced.

A core way we materialised this shift in the Outpost was by inviting students to consciously engage with the neighbourhood of their collective homebase, called Penha de França, as Lisbon was too complex to engage as a whole within the timespan

of the Outpost. A smaller team of students committed to a team-wide project whereby they would conduct a Story of Place® (Mang, 2009; Mang & Reed, 2012) — a transformative research and engagement process — designed to understand Penha de França as a living system and surface its inherent potential. A Story of Place is a pattern-based understanding of a community and its landscape, which allows for the articulation of the timeless essence and unique identity of a place. It illuminates the essential underlying patterns to emerge from the specific bio-geo-physical and historical context that give a place its distinctive character, enabling a better grasp of the whole and designing for interventions that are more harmonious with place.

The local partner LÚCIDA guided the student team in a co-creative way so that they could sense, probe and make meaning of their discoveries as they increasingly became place-wise about Penha de França. By investigating ecological patterns they came to understand how the physical and biological ground originally gave rise to human cultural phenomena in Penha de França. By engaging in immersive listening, they conducted interviews with locals and meandered through its streets to gather the "lived experience" of its people. By essentialising their findings into key patterns they hinted at the uniqueness and significance of Penha de França. And by using this newly revealed story of place they painted a vivid, aspirational picture of the community's future health and what it is truly capable of becoming — both for the people there but also for its role for Lisbon.

The students crystallised their discoveries into a short movie (Berg et al., 2024), allowing their own unique perspective to come forward about the living dynamics that make Penha de França. They further used this movie and their practice in experience design to convene a few local stakeholder meetings. The primary purpose was to present locals with a new perspective about their place, beyond current problems and phenomena and invite them to (re-)engage with the spirit and evolutionary potential of their place, while awakening a new source of care for it. This effect was visible both in the participants and the student team who led this process, who reported a new or renewed sense of belonging to Penha de França and, as such, being invested in its wellbeing.

From problem-solving to potential activation

Working from potential allowed students to orient towards future possibilities rather than reproducing responses to past problems. This supported a mindset shift from control to contribution, aligning learning with life's capacity to evolve rather than merely adapt.

Regenerative approaches start from potential instead of problems because problem-solving dictates a future based on past and present problems rather than entire ranges of new possibilities. Working from potential is possible when we are able to see ourselves and what we do as embedded in nested-wholes and to find ways to reconcile tensions or polarities in particular situations or activities for the benefit of the whole.

A particular example of where we worked from potential was in the process of sourcing local partner projects for the students to collaborate with in smaller teams. Had we approached this from a problem-solving approach, we would have surveyed students' individual preferences only and then catered to those preferences locally. Instead, we created a process early on (during the introduction to the Outpost semester in Aarhus, a few months before the beginning of the Outpost) that invited the students to engage with Lisbon in a multisensorial way, across time and space, from Aarhus. We tracked what resonated with them in terms of what they were learning about Lisbon from that embodied and evolutionary perspective. And then we surfaced what drove the students throughout their lives, what they aspired to on their paths and the change they hoped to see in the world.

We thus listened to both what was being voiced from Lisbon and what activated each student individually. And holding those two creative forces together, we were able to identify key patterns of work areas and organisational cultures that would reconcile individual preferences with local needs. These insights underpinned the process of sourcing partner projects, during which we co-sensed and co-shaped project proposals with local partners.

The students collaborated with a diverse set of seven organisations, including grassroots cooperatives, NGOs, innovation networks, creative agencies and municipal institutions. These partners worked across sectors such as food systems, health tech, urban regeneration, civic design and environmental sustainability. The nature of the collaborations ranged from strategic co-design and system mapping to creative prototyping and capacity building, always guided by mutual learning and regenerative intent.

We continued to work with the students to foster and sustain this potential mindset, both in implicit ways, within their individual and project guidance, and explicit ways, during the mid-term project review and in the final reflection days sessions.

Transformative elements

The Outpost surfaced significant shifts in student mindset, values and capacities, captured by the students themselves in their final publication (Kaospilot, 2024). These shifts resonate deeply with the type of learning envisioned in No Limits to Hope and articulated in *No Limits to Learning*: learning that is anticipatory (i.e. invites working with futures and not reacting to problems), participatory (i.e. oriented towards learning with systems and communities, not about them) and integrative (i.e. not just working across disciplines but also working on inner development, collective action and systemic awareness simultaneously. Across their reflections and local partner project narratives, students describe a movement away from problem-solving and predefined solutions towards sense-making, relational engagement and responsibility to place.

More specifically, students consistently reframed leadership not as authority or control, but as the capacity to listen, convene and act responsibly within complex systems. Many students began the semester with a strong drive to achieve, act and produce measurable results within their project work. However, over time, this drive gave way to a more relational and emergent approach. Students let go of the need to deliver or perform and learnt instead to hold space (both for their team colleagues and the partners), navigate ambiguity and work with what was arising in the moment.

Context awareness evolved from desktop diagnosis to systemic literacy through system mapping, neighbourhood work and civic engagement. This fostered the ability to perceive boundaries, feedback loops and power dynamics within the systems they were embedded in — in particular within Team 30 and the partner projects organisations. Students came to see themselves not as detached observers or problem-solvers, but as participants in these living systems. This shift in self-perception opened the door to more humble, grounded forms of engagement — ones that prioritised reciprocity, relational depth and the ability to sense potential in context. Additionally, intercultural humility emerged as students navigated Lisbon's unfamiliar cultural and linguistic terrain. The experience of being "outsiders" helped surface unconscious assumptions, foster greater listening and build more empathetic

partnerships.

Regenerative literacy emerged as embodied understanding — developed through engagement with local food systems, governance structures and migration issues as fields of endeavour within which they were immersed. This transformation was particularly poignant for those students engaged more deeply with their homebase neighbourhood Penha de França. By engaging with dynamic systemic frameworks from regenerative development and conducting a Story of Place® process, students began to appreciate the evolutionary nature of change and the importance of designing from place-sourced potential as a way to bring about societal change.

In our view, what emerged, ultimately, was a learning culture that was an embodied, lived expression of the kind of innovative learning *No Limits to Learning* called for 45 years ago and that No Limits to Hope seeks to cultivate today.

Systemic and civic ripples

The regenerative orientation of the Outpost did not remain confined to the student cohort; it extended outward, as illustrated by the following examples on how the Outpost's learning culture also translated into relational and institutional shifts.

In the Lisbon neighbourhood of Penha de França, the presence of Kaospilot students and their engagement in a collective Story of Place® process helped unearth the unique essence and potential of this place (Berg et al., 2024) and catalyse new conversations and connections. A diverse set of actors — including the local parish, civic associations, municipal departments and cultural organisations — began to see themselves as part of a shared narrative. This growing sense of interconnection laid the groundwork for what is now emerging as a neighbourhood "guild" of stewards and stakeholders invested in the vitality of Penha de França.

The Parish of Penha de França (Junta de Freguesia) reported increased vitality and a renewed sense of care by engaging with the Story of Place process and the rest of the community. The level of engagement of their team with the territory also increased, and they started partnering with Impact Hub for the first time after the Outpost 2024. They are now exploring ways to collaborate in the context of the potential of Penha de França and the local system and the value each entity adds.

Impact Hub, Kaospilot's homebase for the Outpost, awoke to a deeper relationship with Penha de França and is looking to evolve their role from a workspace provider to a key facilitator stakeholder within the territory, either by considering the local community as a potential beneficiary of the programmes or projects they are

designing or by hosting events and activations that foster place-based connections.

LÚCIDA, as the local partner, co-organised a conference about the living systems approach and territorial development called "Lisboa Viva" in January 2025, when the Outpost Story of Penha de França project served as a key case study in a panel on "Local Development and Living Systems Thinking." The discussion showcased how viewing territories as holistic, interdependent systems leads to concrete shifts in engagement and local collaboration. The conference reinforced the value of systemic approaches and sparked further interest from institutions like the Lisbon Municipality in applying these principles to urban development.

Finally, the Participatory Department of Lisbon Municipality, having engaged with the Outpost projects and the Conference Lisboa Viva, was motivated to actively explore different participatory processes and systemic approaches to urban engagement. Inspired by the impact in Penha de França and living systems thinking, they met with LÚCIDA and Impact Hub to discuss further opportunities for collaboration within a concept of an "Urban Living Lab" — co-created spaces for prototyping interventions that allow communities to think, feel and visualise the city's potential as a living system.

Critical reflections

While the Lisbon Outpost generated meaningful transformations at individual, team, institutional and community levels, it also revealed tensions and challenges inherent to experimenting with regenerative education. One key tension emerged between the logic of self-managed, student-led learning and the more emergent, life-aligned rhythm of regenerative work. Students were invited to lead their own individual and project-work journeys but also to attune to a broader systemic context — one that often moved at a slower, less linear pace. Holding these two timelines — agency and emergence — required a kind of discernment and maturity that itself became part of the learning.

Moreover, working regeneratively within a new cultural context raised important questions around power, positionality and the ethics of engagement. Students were mostly foreigners entering communities with deep histories, and while their approach was grounded in humility and reciprocity, the short time span of the Outpost placed limits on the depth of relationship possible. At times, students questioned whether their presence was extractive or generative — a question that was not resolved but held openly throughout the process.

Another critical reflection emerged around the discomfort of unlearning. Several

students shared that shifting from performance-oriented mindsets to relational ones created confusion, especially in the early stages of the semester. Letting go of familiar notions of success without yet having internalised a regenerative frame left a temporary vacuum — an "in-between" state where anxiety could surface. It became clear that regeneration is not only about gaining new skills but about navigating disorientation and ambiguity with care.

Conclusion

The Lisbon Outpost rested on a different understanding of what education could be. Place was not treated as a neutral backdrop to educational activity, but as a teacher with its own dynamics, singularity and potential. Partnership was not approached as a strategy to achieve predefined outcomes but as a way of being in relationship with others and with the territory. Learning, in turn, was not conceived as the development or upgrading of skills but as a transformative process through which students, partners and their contexts could evolve together.

In doing so, this case echoes and extends the vision put forth by *No Limits to Learning* in 1979. It suggests that bridging the "human gap" is not a matter of adding new knowledge but of reshaping the conditions under which learning happens — so that individuals and systems may evolve together. It requires learning environments intentionally designed to operate as living systems. When learners experience themselves as participants in nested wholes, engage places through reciprocity and work from potential rather than problems, learning becomes transformative rather than adaptive. The Lisbon Outpost demonstrates how such conditions can be created in practice — and how they can generate effects that extend into institutions, communities and governance.

In a time of accelerating planetary crises, this case suggests that education capable of addressing the human gap must itself become systemic, place-responsive and life-aligned. As No Limits to Hope urges us to reimagine the future of learning, the case presented herein affirms that the future is already emerging in messy, relational, hopeful experiments like these. What remains is to listen, support and learn from them not as scalable models but as seeds of transformation.

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Rebuilding systems from the ground up: a new pedagogy for systemic renewal

Heather Cetrangolo[*]

Abstract

This paper presents an emerging pedagogy for systemic change called "Systemic Renewal." It is designed for industry leaders who are rebuilding their systems "from the ground up." The methodology recognises that to achieve the Sustainable Development Goals (SDGs) many organisations and sectors are being called on to rebuild and reconstruct their vision and infrastructure and that, in so doing, they are bridging the "human gap" described in the *No Limits to Learning* report (Peccei, 1979, p. xiii). Systemic Renewal posits that to achieve this, a "ground up" methodology is required, incorporating a range of actors in highly contextualised learning, including representatives from governance, management and operational levels of a system. This is contrasted with the predominantly "top down" approaches that continue to dominate change-leadership practices and that often rely heavily on external consulting.

The study presents a six-year action research project in which participants from a range of contexts worked to develop a pedagogy for renewal, drawing from critical and Franciscan pedagogy, pragmatism, systemic action research methodologies, restorative practice and narrative transformation. Three stages of research are presented. First, the researcher undertook a critical historical analysis of the early Franciscan movement as a model for achieving sustainable change within long-established institutions. In the second phase of the research, a working theory for Franciscan pedagogy was piloted across three years of participatory action research,

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working with thirty-five faith-based leaders in Melbourne. Finally, Systemic Renewal was piloted with a further 27 actors from 11 nations, including leaders of all faiths and leaders without faith.

Keywords: Systemic Renewal, Franciscan pedagogy, action research

Introduction

Systemic Renewal is for industry leaders who are feeling tired or overwhelmed, attempting to rebuild the vision or infrastructure of their system while under a constant pressure to give up. It is for sustainability teams in mining and insurance companies, educators attempting to address racial justice, start-up entrepreneurs in low-income countries who are rebuilding their economies from the ground up. The purpose of this paper is to introduce Systemic Renewal to the landscape of systems-change leadership. It does so by describing its key components, as developed through participatory action research across a six-year period. This emerging pedagogy is presented in support of the No Limits to Hope project, as a highly participatory and integrative framework that offers a powerful alternative to "maintenance learning" (Botkin et al., 1979, p. 10). That is, it provides an evidence-based approach to gently, lovingly breaking down any reluctance to questioning established modes of operating.

Systemic Renewal is a pedagogy that was developed from and inspired by the example of the early Franciscan movement, applied to a range of sectors and contexts today. It is defined as *a pedagogy for rebuilding vision and infrastructure from the ground up*. The result of the study was the development of a four-part action research methodology that is transferable and repeatable. The pedagogy works from the ground up in two ways: philosophically and practically. First, it is an action research process that holds to an ethic: a commitment to engaging actors across all levels of a system. This includes the governance, management and "factory floor" or "operational" levels. Secondly, Systemic Renewal focuses on researching collective mindsets at the roots of the system and developing strategies that renew that mindset across micro-, meso- and macro-layers of experience.

It is argued that top-down solutions are both unjust and less effective than solutions crafted collaboratively between actors at all levels of a hierarchy. The Systemic Renewal process gathers a team called a "trust," who engage in a voluntary, confidential and highly egalitarian process, internal to the organisation or sector. This process was designed to bridge what Aurelio Peccei (1979) termed the

"human gap": the difficulty human beings face in perceiving and responding to the consequences of Western notions of "progress" (p. xiii). Systemic Renewal makes the process of facing and naming hard truths safe and achievable, in large part, because of its commitment to bridging traditional class divisions in a confidential setting for collaborative learning.

It is widely recognised that the most foundational, critical and powerful lever for systems change is the shifting of mindsets (Meadows, 1999, pp. 17–19). This has been termed, in ancient Jewish and Christian communities and more recently by Peter Senge (2006), *metanoia* (p. 12) — a change of mind. This study drew from the first 100 years of Franciscan history to consider the pedagogies utilised over that period and how these changed individual and collective mindsets to achieve scalable social reform within the space of 20 years. In addition to their solidarity with the poor and championing the dignity of those living with leprosy, the Franciscans were championed for their impact in counteracting corruption in civic and religious institutions and reconciling relationships between human beings and nature (Robson, 2006, p. 48, pp. 50–51; Hewlett, 2022).

Research questions

The question that frames this study is *How can Systemic Renewal be classified and transferred to leaders across a range of sectors?* Secondary questions include:

- How can practitioners problem-solve at the micro-, meso- and macro-levels of their system in simultaneous and integrated modalities?

- What techniques enable participants to anticipate and iterate renewed mindsets and strategies for their system?

Rationale

The world is in polycrisis; it needs deep systemic change — and fast. The global economy is failing to transition to meet the Paris Agreement targets; national governments have not met commitments to finance low-income countries on the front lines of the climate crisis (United Nations Environment Programme, 2024); and only 12% of the Sustainable Development Goals (SDGs) are on track (Guterres, 2023). The worth and dignity of human lives are compromised everywhere we look, from the roots of our economic and social trees to the fruit. Currently, 700 million people live in extreme poverty; one in five children are living in conflict zones; and the humanitarian sector has seen an 80% rise in need since 2019 (Micah Australia, n.d.,

p. 6). These challenges are complex and overlapping.

Systemic Renewal uniquely draws from the ancient Hebrew notion of *hiddush*, meaning "renewal" as a learning framework. The term refers to a novel interpretation or approach to previously existing ideas or works. The word specifically describes an innovation that occurs inside a system, as opposed to outside of it. It is a pedagogy that begins "with"; standing inside a system with intention to love and understand and, therefore, question the status quo. The practice of Systemic Renewal was developed collaboratively, with a team engaging in the transfer of the pedagogical practices of Francis of Assisi and the early Franciscan movement.

Francis of Assisi's story began in his early 20s; already a broken and disillusioned young man, he was recovering from post-war trauma, after losing a battle at Collestrada in 1202. He was subsequently held as a prisoner of war for one year. During this time he had a series of mystical encounters. A prominent experience took place in a small chapel called San Damiano, just outside Assisi. The building itself was in disrepair and disuse; the walls were crumbling. There he believed he was called to "rebuild the Church that is in ruins" (See early sources such as the *Legend of the Three Companions*, 1241–1247, pp. 75-77; *The Second Life of Francis by Thomas of Celano*, 1247, pp. 249-250; *The Major Legend by Bonaventure*, 1260–1263, pp. 536-537). In medieval society the word "Church" encompassed civic and religious life, which was blended in a pre-secular time in history. Francis started a movement that, in the space of 20 years, embedded a new pedagogy and expression of faith into the institutional, intellectual and spiritual life of Catholic nations In the Middle Ages. The Franciscans rebuilt systems at that period in history, when trust in institutional and religious authorities — as is the case today — was at an all-time low (Robson, 2006, p. 48, pp. 50–51). It is no surprise that Pope Francis drew heavily from Francis's example in *Laudato Si*, Encyclical (2015), 9-14 and *Fratelli Tutti*, Encyclical (2020), 1-3.

Though Francis lived in a very different time and context, the parallel need today for rebuilding broken trust by embracing new kinds of power (Adern, 2025) and bridging the widening gap between the wealthy and the poor is striking. The Franciscan friars numbered over 10,000 by the time of Francis's death in 1226, and within a century of his death, there were 1,421 friaries (Paris, 1866–1869, pp. 298–9). His followers were widely known for their engaging music, poetry and public speaking, which effected mindset changes for individuals and whole communities. They were celebrated for counteracting corruption and embracing a new kind of power — one that came to people in poverty, namely, simplicity and humility (Moorman, 1988, p. 141). They championed the equality and dignity of people living

with leprosy and those who were unable to work and forced to beg to survive by becoming one with them (See *The Later Rule*, 1223, p. 103).

It is my deep conviction that every human life and community, from our families to our nations, carry innate goodness. As Aurelio Peccei (1979) similarly argued, "What is needed is for all of us to learn how to stir up our dormant potential and use it from now on purposefully and intelligently" (p. xiii). With the right pedagogy, this can be recaptured, making no situation beyond renewal. This conviction is my research bias, which I proudly confess. I share this work with you, drawing from the great example of Francis and the early Franciscan community, as well as modern theorists, including Paolo Freire's pedagogy of the oppressed (1970), Etienne Wenger's social theory describing communities of practice (1999), John Dewey's experiential reflective practice (1916), John Paul Lederach's concept of the "moral imagination" (2005) and David Anderson Hooker and Amy Potter Czajkowski's framework for transforming historical harms (2012).

In the report to the Club of Rome - *No Limits to Learning*, the authors identified the "world problematique" that has developed since the industrial revolution, leading to unparalleled scientific and technological advancement — advancement that, however, was achieved via mechanisms that have exceeded planetary boundaries and led to spiritual and moral crises (Botkin et al., 1979, p. 6). Systemic Renewal aims to contribute to the *human element* of address this *problematique*, that is, the gap between the growing complexity of a global economy and our capacity to respond, which encompasses both the problems we must address and the new opportunities that await us (Botkin et al., 1979, p. 4). Systemic Renewal offers to leaders positioned within long-established institutions and industries a methodology for rebuilding systems. These are essential to addressing the challenges of the Anthropocene.

Methodology

The study presents a six-year research project in which participants from a range of contexts worked to develop a pedagogy for renewal, drawing from critical and Franciscan pedagogy, pragmatism, systemic action research methodologies, restorative practice and narrative transformation. Three stages of research are presented. First, a working theory describing the pedagogy of the early Franciscan community was drawn from a critical historical analysis of early sources that record the first 100 years of the movement. These practices were then described using modern pedagogical terminology.

The second phase of the research engaged three years of participatory action research, including one year of data gathering, to test and develop the practical delivery and transferability of Franciscan pedagogy, through a school called The Francis Project Ltd. The researcher conducted focus groups and semi-structured qualitative interviews and gathered observation and document data. These were then coded and memoed based on grounded theory (Glaser & Strauss, 1967). Data were derived from eight actors: two teachers, four students, an independent observer and the researcher. Document data included the researcher's journal notes, focus group notes, notes prepared by an independent observer, as well as curriculum materials that were used to deliver the programme. Once the data were gathered, analytic memos were made against interview transcripts, focus group transcripts and the document data.

The third phase of the study involved two years of piloting a range of training programmes in Systemic Renewal, engaging 27 actors from 11 nations and a wide range of sectors, to further develop the capacity of the pedagogy. Course evaluations and qualitative interviews were engaged to explore the transferability and applicability of the practice to the leadership of renewal in a range of contexts, with practitioners of all faiths and none. Interview data were presented from a director of policy and research at an institute for climate change in the UK, the dean of a university department for first-response workers in Canada and a senior manager of global engagement for a peacebuilding NGO based in Switzerland. Interviews were structured around simple, open-ended questions inquiring into the aspects of Systemic Renewal that participants were regularly engaging with in their work and any aspects they found difficult to connect with or translate into practice.

Phase one: Extracting the pedagogy of early Franciscans for social reform

The first phase of this study bridged the exploration of a traditional culture with modern science: something old, something new. This resulted in a rediscovery of the Freirean principle that to lead liberative change within a system, one must adopt a critical stance but as a participant, *from within the system* (Freire, 1970). The early Franciscans did this by identifying with the human experience of oppression, by taking vows of absolute poverty. In other words, they positioned themselves to lead change as beggars and lepers, while remaining within the ecclesial life of the Catholic Church. While Freire's epistemology and sociology have been critiqued as being simplistic and colonialist (Bowers, 2005), there is no doubt that his work pioneered critical pedagogy and set the stage for action research rhythms to be multiplied and scaled

for macro-level social change (Simpson & McMillan, 2008, pp. 1–3). Similarly, early Franciscan pedagogy pioneered itinerant, mendicant, informal and artistically laden teaching practices, bearing strong notes of Freirean commitments to remain within corrupt systems, leading change through action learning rhythms.

Though Francis's mission was evangelical, this study carefully redacted the theory and technique in the movement from its religious convictions in order to understand the repeated teaching and learning practices and how these led to social reform. Discovering the detail in this pedagogy began with a critical analysis of early sources to discover what was historically consistent in the pedagogical practices of early Franciscans; I then used this analysis to consider what was likely to be transferable or variable. At first glance this might seem to be an elusive task and to lack the possibility of a credible framework. Surely such an exploration of history is problematically subjective? The theoretical premise of this study was that if the early Franciscans themselves were able to effect widescale social reform, and through a shared identity and way of life that was repeatable, transferable and scalable, there must have been consistent elements that could be extracted. The study focused on the First and Second Orders, favouring a narrow scope of inquiry, in the attempt to uncover this essence.

The first step in the process of defining Franciscan pedagogy was to isolate the core and consistent elements of Franciscan religious identity and from these the core and consistent pedagogies that were indispensably tethered to them. This was achieved by arguing that the heart of Francis's vision that informed the early Franciscan way of life was the lived expression of the *vita apostolica*: a sociological and spiritual movement of the eleventh and twelfth centuries in the West, which was marked by a search for a more authentic Christian life (Cusato, 2009, p. 53). For Francis, this took a specific form, after he heard a particular scripture read aloud at Mass, which shaped and anchored the vision for the Franciscans: Matthew 10:7-14. These instructions given by Jesus to the first apostles formed the blueprint for the Franciscan vows and lifestyle.

Anchoring the study in the lived expression of this text enabled the sidelining of any search for the "real Francis" and a focus on evidence of shared understanding and practices in order to develop a classification of Franciscan pedagogy. An observable component of Franciscan pedagogy was included in the working theory if it was:

1. identifiably drawn from the early Franciscan expression of Matthew 10:7-11;

2. identifiable in the teaching and example of Francis himself;

3. identifiable within the history of early Franciscanism in a way that was:

   a. clearly linked to the evangelical vision of Francis; and

   b. evidenced by repeat and consistent usage, as opposed to isolated examples.

Though a detailed exposition is beyond the scope of this paper, a critical reading of the early sources, beginning with Francis's own writings, the *Earlier Rule* and *Later Rule*, and biographies written about him, uncovered three pedagogical themes:

1. A commitment to *mobility* and travelling light: engaging flexible, emergent learning styles led the early Franciscans to develop *itinerant communities of practice*;

2. A commitment to the *care of individuals* was expressed in rhythms of listening: withdrawing to pray and reflect led the early Franciscans to engage *experiential reflective practice*; and

3. A commitment to *poverty*, both materially and prophetically, led the early Franciscans to *dramatise their own experiential learning.*

Phase two: Developing the practice and transfer of Franciscan pedagogy

Three years of engaging participatory action research, in the context of The Francis Project, led to a profound discovery about the unique philosophy underpinning Franciscan pedagogy. The three historical commitments to *mobility, care of individuals and poverty,* inspired rhythms in the life of early Franciscans that were addressing mindset changes at the micro-, meso- and macro-layers of human experience (Bronfenbrenner, 1979). The outcome was that though Franciscans sat on the ground with beggars, with their bare feet, simple tunics and cords around their waists, their impact did not remain at the grassroots. It moved up, from working at the *micro*-level of the individual experiences of a system, to the *meso*-level, working with those in leadership roles in the church and society, to the *macro*-level of shaping the way the Papacy was prepared to imagine religious life for men and women. They pioneered the first religious community that was not cloistered, championing social reform through itinerant social engagement. By putting these pedagogical principles into practice, Francis Project participants discovered a highly integrative, iterative, action learning rhythm that worked at three levels.

1. At the *micro*-level, practitioners identified with the suffering and imperfection of individuals as fellow pilgrims on the journey;

2. At the *meso*-level, practitioners built learning communities based on equality, in which they were also participants; and

3. At the *macro*-level, practitioners identified with the material, cultural, psychological and spiritual poverty of their society, with humility.

After multiple iterations, these dimensions were consolidated into four movements, comprising twelve steps involved in the practice. At the start of each day together, participants in The Francis Project began with personal reflection and small group work that focused on the micro-experience. After morning tea, the group would move into meso-level group work and problem-solving. Afternoons offered a blend of free time and sessions in which participants would begin to rescript the narratives in their sector. Evening sessions engaged macro-level work, during which creative presentations of renewed narratives would be presented. What emerged was a systemic action research methodology that engaged the following, repetitive flow:

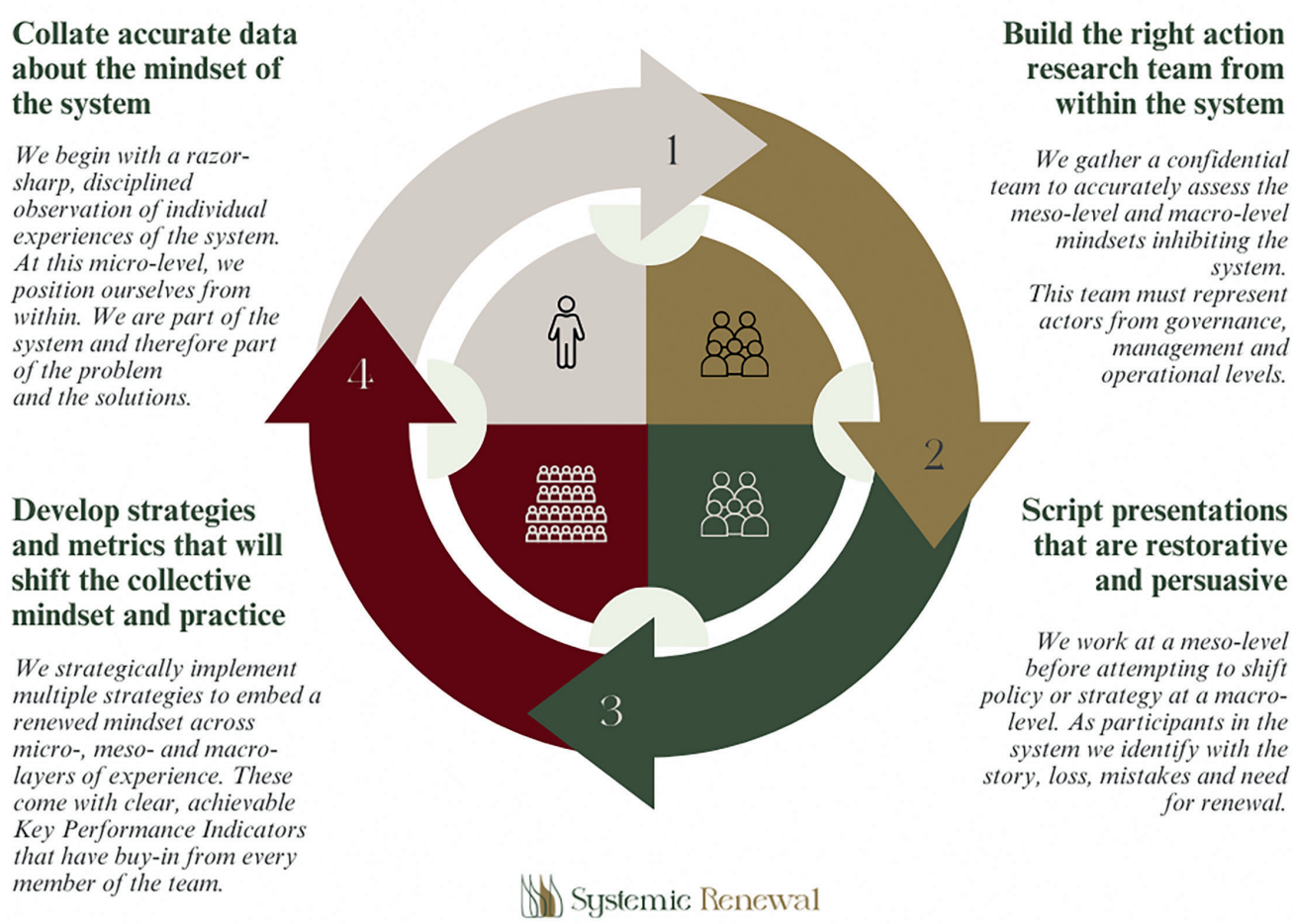


Figure 1: Systemic Renewal Methodology: Micro-, Meso- and Macro-Layered Interventions

Phase three: Developing the practice and transfer of Systemic Renewal

In the third phase of development, Franciscan pedagogy was further explored with leaders from multiple sectors, nations and people of various faiths and of none. These included the peace-building sector, health care, sustainability, social work, mediation, tertiary education, homelessness support, youth workers, faith leaders and members of parliament. A new company was birthed to ground the provision of training and project-work called Systemic Renewal International Pty Ltd. Participants were trained to establish the intentional practice of gathering action research teams that always began with a focus on the experience of individuals. True to its Franciscan roots, this had to include those who held the least power in the system. Participants are always included who sit at the operational (factory-floor) level of the system, as well as management and governance levels. These actors work collaboratively to renew the mindset and infrastructure of their system. In addition to this ethical point of difference, Systemic Renewal is methodologically unique to conventional action research or reflection models, because it discovers and responds to the collective mindset of the system at three levels: micro, meso and macro.

Practitioners of Systemic Renewal begin by collating accurate data about the mindset of the system through experiential reflective practice and by articulating feelings. The action research team gathers in a safe, confidential space for knowledge to be shared across micro-, meso- and macro-layers of experience. The group spend time engaging inner-reflection, sharing data about individual experiences of the system, selecting areas to problem-solve, attending to the feelings associated with experiences and, from there, hypothesising and testing the driving mindsets. Through repetition and ongoing action research, key themes begin to emerge and reemerge. Participants interrogate the problems they are selecting to workshop by asking four questions inspired by early Franciscan preaching and informed by Jurgen Habermas' (1981) social theory for inquiry:

Is it true (i.e. factually correct)?

Is it true today (i.e. current)?

Is it comprehensible?

Is it right (in the sense of morally appropriate)?

Throughout a two-year period, twenty-seven actors practiced these rhythms of gathering data from the micro-level of experience, then working with an action research team called a Systemic Renewal Trust to confidentially analyse the meso-level and macro-level mindsets impacting their system. This proved remarkably effective at moving past "broad-brush-stroke" assumptions about the mindsets held in a system, such as "it is racist" or "they care more about profit than planet," towards a more data-driven, specific discovery of patterns of thinking shared within a community. For example, racism might be more accurately understood in terms of the subconscious fear of loss of culture, control or perceived Western values. Specific strategies can then be developed to shift the collective mindset from fear to courage. Another example is that it may be incorrect to assume that people don't care about the planet. The hidden mindset may be that a company considers itself powerless to effect change in the context of the global financial architecture. It may be a feeling of powerlessness that needs to shift, as opposed to a lack of care. Participants also worked to craft *renewed mindsets* that would counter the untruth, outdatedness, lack of clarity or injustice of those they were uncovering.

A senior manager of a humanitarian organisation described the trust as "giving a structure, a theoretical framework that's grounded in evidence, that works to unlock things that were brewing." In evaluation surveys we asked participants in our training to rate the success of the process in identifying root-problems keeping us from renewal: 88% gave us four stars or more. For the success of the process in problem-solving the needs of the organisation: 75% gave us four stars or more.

Three participants were interviewed for the purpose of this paper. These participants all expressed that the strategies made hard conversations comfortable to have, because participants were taken outside of their usual power dynamics and engaged in an intentional, guided process. They particularly valued the metaphor of a tree that was used to consider how the health and rate of production of a tree's fruit reflects the mindsets that sit at the roots of the system. They also valued the focus on auditing the history of a system, not only to observe its challenges or mistakes but also its strengths: the *essential good* that has emerged consistently in its story. They experienced Systemic Renewal as a unique blend of spiritually and emotionally intelligent care to effect the science of achieving technical, systemic change. As one interviewee commented, "I love that we were encouraged to see inner reflection as *work*." Another interviewee credited her presentation of a TEDx talk on inner reflection to her training in Systemic Renewal.

Conclusions and recommendations

The result of the study was the development of a four-part action research methodology that is transferable and repeatable. The practice selectively engages an action research team who represent governance, management and operational levels of a system to work collaboratively and iteratively on gathering data and creating problem-solutions. This dynamic embeds an ethic of equality into the learning process. As one interviewee commented:

"Beneath decision-makers is the corner office or what's going on in the engine room. That's the level where we need to start. That's where the true meaning of the organisation lives. It's not in the vision statement, or the mission, vision or value statements. It's what people believe about, not only the organisation but their role in the organisation."

Practitioners seek to rediscover the unique strengths, or *essential good*, of their system and translate these into a modern context. The four disciplines are:

1. Collating accurate data about the mindset of the system;

2. Building the right action research team from within the system;

3. Scripting presentations that are restorative and persuasive; and

4. Developing strategies and metrics that will shift the collective mindset and practice.

The data from the study revealed a continuous flow between *four disciplines* of engagement with human experience. Through these, Systemic Renewal enables practitioners to discover and problem-solve the mindset of the system at three levels of human experience: micro (individual), meso (organisational) and macro (societal). Practitioners achieve this by positioning themselves within the system, while retaining a critical stance. This leads to a practical capacity to form safe, effective processes for the discovery of the "human gap" between our capacity for productivity and our willingness to engage a mindset that is responsive to the consequences for nature (Peccei, 1979, p. xiii). Systemic Renewal is an emerging pedagogy with a unique capacity to enable hidden mindsets in long-established industries to be accurately discovered and effectively shifted.

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Innovative learning with World Heritage in the early post-Anthropocene

*Jacobus Bracker** *and Maike Land*

Abstract

Amidst a planetary polycrisis a new civilisational paradigm is emerging: ecocultures of an early post-Anthropocene are traceable all over the world, challenging the fossil fuel era's remnants by reconnecting humans and Earth. Our contribution reflects on how Education for Sustainable Development (ESD) can support this mind-shifting cultural transformation in this critical moment.

We explore how UNESCO World Heritage Sites can serve as living laboratories for transformative learning, fostering (re-)weaving nets of meanings and values to reconnect to Earth. Such sites are powerful tools for ESD offering tangible connections to deep time, history, culture, the environment and traditional knowledge. They are spaces of past and present anticipations and potentialities for a range of futures. Through interdisciplinary and intercultural encounters, learners explore the associative richness of these sites, developing a critical awareness of current challenges and the cultural patterns shaping them.

By understanding the constructed nature of worldviews, learners are empowered to develop pathways towards alternative futures. Heritage-based learning, which foregrounds experiential, place-based education, enables learners to move from cognitive understanding to action — bridging the "human gap" that separates knowledge from systemic transformation.

Ultimately, this work contributes to the vision of No Limits to Hope by advocating for education grounded in connection, critical reflection and cultural resonance.

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Furthermore, emphasising images as elements of learning empowers learners to imagine and co-create sustainable futures.

Keywords: post-Anthropocene, ecocultures, ESD, World Heritage Sites, visual culture

Introduction, now, atmospheric CO2: 428.07 ppm[1]

While actions needed to maintain liveable conditions for the community of life on Earth are outlined abundantly, political responses are insufficient. Obviously, the real challenge in moving towards an ecological civilisation lies not in its impossibility but in overcoming the lack of political will and commitment. Why are we running headlong into a global catastrophe despite decades of warnings by climate scientists (starting with Arrhenius, 1896), Indigenous leaders (Kopenawa & Albert, 2013), organisations (Meadows et al., 1972) and philosophers like Hans Jonas, who formulated an ecological imperative already in 1979 (Jonas, 1979)?

The defining features of the Anthropocene — such as the climate crisis, loss of biodiversity and prevalence of pollution — vigorously call into question Western dichotomies of nature and culture. Humans have become a geologic force but are unable to handle this new superpower. Thinkers like Bruno Latour and Philippe Descola suggest that we must familiarise our anthropocentric minds with a concept once considered savage (Descola, 2011; Latour, 2017, 2018): the idea that all beings and things on Earth are interconnected. The separation of nature and culture is a contingent product of Western becoming, shaped by systems of oppression such as patriarchy and colonialism, which impedes actions of care for the more-than-human world we are part of and dependent on. With human actions being governed by cultural patterns, reconnecting with Earth must begin in our minds — with reconfiguring our webs of meanings ecoculturally — if we are to restore the balance within the living systems.

Especially for "Western" or "modern" humans such a cultural shift is as difficult as it is deeply fundamental. After — as the examples below will show — at least two and a half millennia proudly displaying dominion over nature, this Western project comes along as another great Freudian humiliation, an ecological humiliation at least of Western civilisations.

1 All values for atmospheric CO2 according to Scripps Institution of Oceanography, The Keeling Curve. https://keelingcurve.ucsd.edu/ (20.01.2026).

Recently, the United Nations' *Pact for the Future* recognised the importance of culture for sustainability transformation (United Nations, 2024, p.10). Education, especially ESD (target 4.7 of the United Nations' Sustainable Development Goals and article 14 of the Earth Charter), with its high potential to transform cultures (German Rectors' Conference, 2023, p. 2), plays a tremendously important role in this cultural transformation towards sustainability action. In this paper we explore examples of ecocultural identities as they have been displayed in the imagery of past societies. We explicate why this look into the past is indispensable for reviving — or rewilding — the ecological aspect of current cultural identities and how this perspective can infuse ESD to foster the ecocultural transformations of learners. Although ESD is not at all mainstreamed into all areas of education or curricula in higher education globally, numerous initiatives are emerging worldwide empowering learners to become leaders of sustainable futures. This trend is a vital sign of an ecocultural transformation and the dawn of the early post-Anthropocene.

Finally, we discover why the — essentially human (Jonas, 1961, p. 162) — power of image-making is a central element of learning.

Athens, ca. 570 BCE, atmospheric CO2: ca. 275 ppm

The conceptual separation between (human) culture and nature, evident in the tendency of "Western" or "modern" societies to treat animals, plants and the Earth as objects, arises from a profound perceptual shift or even loss of the capacity to perceive the natural environment (Abram, 1996, pp. 27–28). For many humans their "ecological selves have become steadily less accessible" (Milstein & Castro-Sotomayor, 2020, p. xvii). It is exactly this story of a progressing perceptual shift away from nature that is recognisable in the trajectory of ancient Greek art. Two examples of architectural ornament from the UNESCO World Heritage Site of the Athenian Acropolis make this story visible and comprehensible for learners.

First, we look at the west pediment (Acropolis Museum, n.d.) of the *Hekatompedon*, a temple dating back to the 6th century BCE, which was probably dedicated to Athena and a precursor of the Parthenon. The pediment contains three groups of figures showing mythical scenes, carved in high relief from blocks of yellowish *poros*, a coarse limestone from the Piraeus peninsula (Heberdey, 1919, pp. 182–183). In the centre, two lions — explicitly larger than their prey — have worried an adult bull. The spandrels of the pediment show mythical heroes encountering sea creatures in faraway regions (cf. Knell, 1990, p. 4; Schuchhardt, 1940, p. 22): The left shows Heracles — the mortal son of Zeus — wrestling with a fishlike body, Nereus (Schuchhardt, 1940, p. 22) or

Triton (Buschor, 1922, p. 58), both sea deities who mediate between the gods and the ocean's elemental forces. On the right, a standing figure confronts a three-bodied, winged creature, consisting of three bearded, male figures, whose lower bodies are intertwined snakes. The figures hold objects symbolising elements of nature: a wave for water, a thunder bolt for fire and a bird for air. The snake bodies represent earth as the fourth element. The human figure is probably Menelaus, a Greek hero who, returning from the Trojan War, seeks the sea-god's guidance about the whereabouts of his wife Helena (Knell, 1990, p. 4). The pediment is framed by Hymettian marble, which is carved with a lotus-palmette pattern (Schuchhardt, 1935, p. 63, p. 65, p. 103), birds and lotus flowers (Heberdey, 1919, pp. 130 ff.; Schuchhardt, 1935, p. 68).

Having considered how the scenes are mediated, we can now turn to their meaning and interpretive potential. The scenes have both apotropaic and religious-political significance. The lions are underlining Athena's agency and mighty power (Knell, 1990, p. 4). By letting Heracles and Menelaus, both protégés of Athena, successfully persist against the sea-gods the goddess's protection is demonstrated. Referencing the sea's composition further hints at new claims to power in Athens (Knell, 1990, pp. 5–6).

Next to these religious-political layers environmental relations are also represented. Viewers and learners are encouraged to question the underlying frames of ancient geo- and biopolitics. Strikingly, the sequence of the figures corresponds to a succession of regions epitomising the Greek worldview: while the temple itself marks the urban centre (*asty*) of the *polis*, the Greek city state, the domesticated bull can be associated with the *chora*, the *polis*'s hinterland; the lions point to the *eschatia*, the wilderness, and the mythical events to faraway lands and seas (cf. Hölscher 2013, pp. 47–49). The Greek human world visibly starts distancing itself from the more-than-human domains. Finally, questions remain about why everything is framed by abstract lotuses and palmettes — a neglected realm of plants relegated to the ornamental (cf. Coccia, 2020, p. 15; the vegetal elements deriving from the tiger lotus are extremely abstracted and pictorially domesticated and seem to have ornamental framing function only) — and birds and what this can tell us about how Athenians of the early 6th century BCE related to their environment.

The Greek heroes on faraway seas reference a developing culture of expansion and exploitation. Although humans are still depicted as small in comparison with the personifications of natural powers — Nereus, Triton and Proteus — claims are made towards human dominion. Further, as there are no lions living in the Greek wilderness today the ecological question arises whether this was so in antiquity, and if they did exist, why they have become extinct. The practice of using tons of marble

from mount Hymettos and limestone from the Piraeus and dragging it up to the Acropolis to carve these images contains an impressive geomorphic gesture continued today by bringing them to museums all over the world. For learners this opens new perspectives on the turbations[2] of geologically preserved deep-time caused by human interventions and the perception of geological time, an important skill for grasping the full meaning of the Anthropocene.

The increasing exploitation of nature is reflected in ancient literature: the Greek philosopher Plato authored the fictive dialogue *Critias*, which is supposed to have taken place between 440 and 415 BCE, close to when the Parthenon was completed. In it, Critias bemoans the decline of the fertility of Attica's soil, attributing it to deforestation resulting from agriculture and the manufacturing of warships, which led to erosion and reduced the land's ability to retain rainwater (Platon, Critias, 111a–d; Harris, 2011).

The second example mediated ancient Greek human-environment relations comes from the Parthenon. This monumental temple was dedicated to the goddess Athena and again was placed high above Athens on the Acropolis. Several reliefs depict Greeks defending their "modern," i.e. cultivated and heroic, identity against the forces of wilderness and otherness — often represented through gendered and exoticised figures such as Amazons wearing Eastern attire. Our focus is the western pediment, which stages the contest between Athena and Poseidon over the sovereignty of Athens. As Athena let an olive tree grow and Poseidon only offered a salty spring for Athens, humans gave the victory to Athena. However, Poseidon was still venerated by the Athenians because he, too, played a necessary role in affirming Athenian power over the sea — at cape Sounion high on a cliff a temple was dedicated to him, marking the Attic territory towards the sea as widely visible.

Again, the whole imagery is highly geo- and bio-politically laden and — compared to the roughly 150-years-older precursor discussed above — much more anthropocentric. By depicting Athena and Poseidon as granting the Athenians favour, the images legitimise their power over the Attic land and the sea. Elements of the environment in the Western sense of nature are — like the olive tree — only marginally depicted, which might hint at a concept of the human-environment relation characterised by human supremacy and by the availability of nature to be used to fulfil human need. The usefulness of the gods was measured by the Greeks in relation to the usefulness of the natural resources they offered.

2 Turbation is a term used in geology and archaeology to describe the mixing of different strata of soils

The increasingly anthropocentric representation of nature in Greek art reflects a broader cultural and ideological shift — one that contributed to the very conditions critiqued in the *Critias* and continued in the becoming of the Anthropocene.

The "past is a foreign country" (Lowenthal, 2015, p. 363), so dealing with the past is an intercultural encounter. It opens a third space *sensu* Homi Bhabha (1994, pp. 36–38), where webs of meaning hybridise and new cultural concepts emerge. Describing ancient images in detail and relaying them to ancient concepts of humans and environments is, therefore, likely to foster critical reflection in learners' minds about today's concepts and to plant the seed of cultural transformation. Especially for Westerners who often refer enthusiastically to ancient Greece as the cradle of democracy and philosophy a critical view on these roots can be opened. The consequences of lowered groundwater levels as reported by Plato can still be experienced when, traveling in Greece, you are asked to save water, a good example for teaching the importance of ecological foresight skills (cf. art. 6 Earth Charter). Having examined the cultural roots and traced the development of anthropocenic thinking in ancient Greece, we now consider what further insights the past may offer.

Mỹ Sơn, ca. 700 CE, atmospheric CO2: ca. 279 ppm

We continue our journey through the past at the UNESCO World Heritage Site of Mỹ Sơn in present-day central Vietnam, where the cultural and environmental context presents a different situation. The complex of Cham temples is situated between small rivers in a valley between mountains. The sculptural remains of one of the older temples, E1, date to the 7th/8th century CE, more than a thousand years after the dedication of the Parthenon. Yet while in ancient Greece the mindset shifted towards an anthropocentric worldview, in Mỹ Sơn nature is not portrayed as something to be exploited. What, then, might this site reveal about alternative ways of inhabiting the world?

E1, which is seven-by-seven metres, is much smaller than the monumental Greek temples. The base of temple E1, now at the Museum of Cham Sculpture, Đà Nẵng, shows reliefs of ascetics meditating, reading, or playing music below trees in the company of parrots and squirrels (for images cf. Chau, n.d.). Here, nature is a space into which humans blend — a welcoming environment for coexistence, rather than a realm to be dominated and exploited.

These contrasting worldviews are not only discovered in retrospect: Plutarch, when writing about the Greek conquering moves by Alexander the Great to India in 327 BCE, describes so-called γυμνοσοφισταί, ascetics who were as witty as sophists

but irritatingly naked and had no desire for material things. Plutarch states:

"victorious Greeks should dance again in India and revive the memory of the Bacchic revels among the savage mountain tribes beyond the Caucasus. Even there it is said that there are certain holy men, […] who follow a rigid gymnosophy […]; they are more frugal than Diogenes since they have no need of a wallet. For they do not store up food, since they have it ever fresh and green from the earth; the flowing rivers give them drink and they have fallen leaves and grassy earth to lie upon." (Plutarch, Moralia 332)

This remarkable anecdote on the clash of ecocultures is still relevant for contemporary negotiation processes: it illustrates that there are alternative ways of relating to the world — ways that differ fundamentally from the "Western" and "modern" paradigms underpinning the Anthropocene.

Borobudur, 800 CE // now — atmospheric CO2: 276 // 428.07 ppm

After meeting ancient Greek and Cham cultures reflecting contrasting ways of relating to nature — one leaning towards domination, the other towards coexistence — we continue our learning journey in 800 CE, in a region known today as Indonesia: at the UNESCO World Heritage Site of Borobudur on Java human agency and the power of ancient images work together towards an ecological civilisation by caring for cultural and natural heritage.

Borobodur is a Buddhist temple that has a square base with an edge length of roughly 123 metres. The surface of the structure is overlayed with 1,460 reliefs telling stories about the life of the Buddha and the principle of *karma*, amounting to a total area of 2,500 square metres (Suamba, 2015, p. 19). In 1991 Borobudur had been recognised as a World Heritage Site by UNESCO. Its "outstanding universal value" (OUV) — a decisive criterion for recognition (Art. 1 WHC 1972) — had been substantiated as follows: "Borobudur Temple Compounds with its stepped, unroofed pyramid consisting of ten superimposing terraces, crowned by a large bell-shaped dome is a *harmonious marriage of stupas, temple and mountain* that is a masterpiece of Buddhist architecture and monumental arts" (UNESCO, n. D., Borobudur Temple Compounds; our emphasis).

We take a closer look at relief O-105 of the hidden foot of Borobudur (cf. image at the Wereld Museum archive (n.d.)). The hidden foot is the original base of the Buddhist temple which, in a later phase of construction, was concealed. It encircles

the entire structure and contains 160 reliefs that depict the Mahakarmawibhangga, a Mahāyāna Buddhist text that explains the workings of karma (Safitri et al., 2024, p. 630). Panel O-105 shows four monks meditating in rock niches, being surrounded by diverse animals and plants: a pair of Javan tigers, a muntjac, three long-tailed macaques, an Asian palm civet, a binturong, a pair of lesser mouse-deer, snails/gastropods, nectar-eating sunbirds, giant taro, mango, jackfruit, sugarcane, banana and tropical almond (Rusdianto et al., 2024, pp. 104–105). The motif is similar to that of the Cham temple E1 (see above) although the biodiversity depicted is even greater.

The composition of the relief suggests "that plants, animals, and humans have inherent equality," and humans are not perceived as superior to animals and plants (Rusdianto et al., 2024, p. 111). However, the ecosystem shown is not intact anymore. The Javan tiger is extinct today, and other species are endangered, so the relief reminds us painfully of the ongoing sixth mass extinction.

At the same time the OUV of Borobudur is under threat by several factors like construction, tourism, deterioration of the stone and acidic ash deposits from the eruption of Mount Merapi in 2010. Within the monitoring processes regulated under the WHC and the Operational Guidelines in 2021 a state of conservation report had been issued by Indonesia along with a management plan for Borobudur, which enumerates the environmental pressures (Indonesia, 2021, p. 56):

High levels of pollution; a lot of dust and trash that got into the crevices of the temple stone, b. High levels of air pollution, noise and waste generated from tourism activities that are a burden to the environment, c. Climate change which has an impact on the preservation of the temple and its elements (relief), d. The decline in the quality of water availability (which is also a development impact) causes the carrying capacity of agriculture to decrease, e. The decline in the quality of the rural atmosphere and the disruption of the cultural landscape of the Borobudur Temple Compounds. Forest clearing in Menoreh has resulted in landslides, drought and increased degraded land (which also creates disaster risks as described above)."

Correspondingly, improvement in the quality of the environment in general and protection of natural resources, especially the surrounding forests are aims for the future. Remarkably, to improve the quality of the environment and natural resources in the Borobudur Temple Compounds, the action proposed is to maintain the vegetation by paying attention to the types of vegetation which appear on the reliefs and in texts and local wisdom. This impressively illustrates the potential of heritage-based learning in ESD.

While many humans have lost the nature-culture connection and the ability to

perceive the natural environment, heritage sites can teach not only that there are different ways of co-inhabiting Earth but even how to find our way back, for example, by reintroducing ancient vegetation. So, heritage is not only a bridge to a foreign land; it can also provide a map back to coexistence and to the appreciation of nature without reducing it to a resource.

It should be noted that images, the ancient reliefs, play a decisive role for the ecocultural management of this cultural heritage site under the UNESCO regime. Finally, the fact that material remains can foster ecocultural transformation may be considered as an OUV as such.

Conclusion and outlook — atmospheric CO2: depends on our choices

When teaching about cultural theory and the climate crisis, the term "high culture" sometimes triggers discussions. This term is used to characterise the cultures of the ancient Greeks and Egyptians, given their achievements in architecture, literature, the body politic etc. But after discussing the becoming of the Anthropocene, a shift of values may lead to a reconsideration of which cultures, according of their ecocultural potential to care for the community of life, should be characterised as "high cultures."

In these times of crises when a reconfiguration of very deep-rooted cultural traits is necessary, it is the semiotic potential of these associative images, discussed above, that can enrich and transform our webs of meanings. As demonstrated, ancient images can tell a lot about the ecocultures of their time. They store ancient and traditional ecological knowledge. Nowadays, not only do they offer certain models of how to relate to Earth, which enrich our semiospheres, thereby increasing the range of possibilities for finding solutions and strengthening resilience, but they also provide us with the opportunity to critically rethink our recent cultures of exploitation. That demonstrates why images, especially in the context of ESD, are of the utmost importance insofar as they play a "special and different role" (Botkin et al., 1979, p. 41) related to guiding intuition, but because of their culture-transformative power.

We learn that our destructive behaviour is rooted much deeper than in modernity or industrialisation and, hence, will show more resistance against our attempts to transform towards ecocultures. The images from the acropolis invite Western learners especially to critically self-reflect about their anthropocentric and anthropocenic cultural becomings. Being confronted with a millennia old pattern of exploitation of Earth can invite learners to rethink their cultural traits. This becomes all the more

likely when they confront other images — like those presented here from Southeast Asia — that offer alternative ecocultural identities.

What may feel like another humiliation of the rational human helps to underline how deeply we as humans, with all our perceptions and affectability, are interconnected with all that we have separated ourselves from—namely, "nature." The realisation of this interconnectedness which supports our life, which *is* our life, may convince us to observe an ecological imperative to sustain this system in its interconnectedness, an ecological imperative, which, expanding on Hans Jonas, could be phrased: "Act so that the effects of your actions are compatible with the permanence of genuine more-than-human life on earth."

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Daring regenerative futures: embracing change with creative and imaginative approaches

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Abstract

Regenerative futures are a daring idea — a hopeful and radical concept based on the realisation that doing "less worse" is not good enough. As several planetary boundaries are being reached, calls for new ways of learning and engaging with nature are clear and loud. Yet offering alternatives to learning about social-ecological change is challenging. It is far from obvious what is needed to imagine and design regenerative futures in a learning context. In our work as educators and researchers, we have increasingly seen the importance of creating spaces for exploring hope and imagination.

Many educators lack the tools, methods and guidance to go beyond teaching the facts and problems of global challenges and to inspire learners to be creative and actively engage in regenerative and desirable futures. To address this gap, we initiated the collaborative book project *Imagining, Designing and Teaching Regenerative Futures: Art-Science Approaches and Inspirations from Around the World*," emerging from a global network of educators, practitioners and changemakers committed to restoring the relationship between humans and nature and inspiring hope. Featuring 65 tools provided by 120 authors from 30 countries, this book offers support for educators in exploring hopeful ways of teaching and learning.

Creative approaches are a powerful way to engage in global challenges, opening

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our minds to more-than-human perspectives and providing spaces for imagination, experimentation and perspective-taking. Notwithstanding the recognised potential of creative approaches to support learning about social-environmental challenges, wide application across disciplines and geographical contexts is still lagging.

Our contribution to the No Limits to Hope initiative includes the key findings and guiding principles that emerge from this collaborative effort. It illustrates how education can serve as a vehicle for systemic transformative change. It empowers educators to transcend conventional disciplinary pedagogies and cultivate interdisciplinary learning spaces that nourish commitment to transformation, anchored in community, creativity and care.

Keywords: Art-science approaches, transdisciplinarity, hopeful pedagogies, sustainability education, regeneration

Embracing change with creative and imaginative approaches to education

In times like these, which are shaped by multiple crises and complex global issues, there is a growing recognition that education needs to change in order to prepare learners across age groups and geographical contexts for current as well as future challenges. Social-ecological issues are ever more present and affect the lives of many young people and adults. As six of the planetary boundaries are being exceeded (Richardson et al., 2023), calls for new ways of learning and engaging with nature and with the future are both compelling and undeniably necessary. Current and future social-ecological challenges require new and possibly different competences on the part of the younger generation and demand that educators constantly adapt their methods and contents to a changing world (Bentz, 2023; O'Brien et al., 2013).

The Club of Rome has advocated since the 1970s for holistic solutions to addressing complex and interconnected social-ecological challenges. The *No Limits to Learning* report, published in 1979, argues that innovative and more engaging forms of learning are essential for addressing global challenges. Despite a growing acceptance of more creative, holistic and interdisciplinary learning, education about social-ecological challenges continues to be taught largely within the natural sciences and focuses mostly on potential risks and negative impacts (Monroe et al., 2017; Stevenson et al., 2017). In many cases, this way of teaching tends to draw attention to fear-inducing narratives rather than offer practical examples of active engagement. Despite the best intentions of many educators, this approach has been shown to contribute to denial,

emotional numbing and apathy among students (Norgaard, 2011). Unsurprisingly, studies indicate that pessimism and a sense of hopelessness about the future are on the rise among young people (Hickman, 2021). Notwithstanding an overall increasing awareness of social-ecological issues, there is a persistent knowledge-action gap when it comes to moving beyond abstract notions and relating in a way that empowers personal agency and manifests in action. Still, many educational efforts are driven by the assumption that once we know what needs to be done, concrete action will follow. This assumption has failed again and again, suggesting that closing the gap between knowledge and action calls for qualitatively different approaches to learning about global social-ecological issues. It may involve going beyond rational explanations and definitions of problems and engaging people's feelings, emotions, stories, visions and bodies in the learning process. Drawing on the idea of regenerative futures through art-science approaches can be a way to invite more ways of knowing to create generative learning spaces.

Regenerative futures is a hopeful and radical idea with profound implications for learning and engaging in social-ecological challenges. According to Paul Hawken, "regeneration is not only about bringing the world back to life; it is about bringing each of us back to life" (2021, p. 9). This idea highlights that humans are an integral part of nature or *are* nature and have an enormous capacity to restore, support and regenerate living systems. Acts of regeneration imply deep human-nature connections and an interdependent process within which the healthy becoming of every life form is inseparably linked with the healthy unfolding of other living beings. Consequently, human wellbeing is tightly linked to the wellbeing of the environment as a whole. This notion of interdependent relations between humans and nature closely relates to Indigenous ways of knowing. The deep connections between humans and the natural world are a central element in many Indigenous worldviews. Many Indigenous communities share the idea that humans have kinship relationships to animals, trees, rivers, mountains and other elements of the natural world (Bawaka Country et al., 2013; Chilisa, 2017; Johnson et al., 2016; Watts, 2013). Fostering and developing a regenerative perspective invites us to rethink or reformulate the way we imagine our place within the world. Regeneration challenges us to design learning spaces that inspire learners, enhance collaboration, generate hope and empowerment and make us feel alive.

Art-science approaches have gained increasing recognition for offering alternative ways of learning about global challenges. Involving imagination and creativity can help expand our visions of the future, opening our minds to new, regenerative scenarios and helping us becoming kin with the natural world. Through

visual arts, performance and participatory design, learners can experience diverse perspectives and envision alternative futures that transcend conventional boundaries. Transdisciplinary art-science approaches to learning can create spaces for people to engage with regenerative futures on a personal and emotional level, bringing this abstract concept closer to their own lives and communities. This can empower them and activate a desire to engage and contribute to alternative futures (Bentz, 2020; Bentz et al., 2022). Creative methods can be integrated in many disciplines, providing spaces for imagination, experimentation and hope.

In our work as sustainability transformation researchers and educators, we have increasingly seen the importance of creating spaces for exploring hope and imagination. Working in diverse learning contexts has shown us that involving creativity, art and imagination can catalyse transformative learning and new avenues for collective action. Notwithstanding the increasingly recognised potential of creative and transdisciplinary approaches to support learning about global challenges and regenerative futures, wide application across disciplines and geographical contexts is still lagging. To address this gap, we initiated the collaborative book project *Imagining, Designing and Teaching Regenerative Futures — Art-Science Approaches and Experiences from around the World*. Emerging from a global network of educators, practitioners and changemakers committed to restoring the relationship between humans and nature, the book provides tools, methods and guidance for teachers who want to help students realise creative and hopeful alternative futures (Bentz & Ristić Trajković, 2025).

A collaborative book project and learning across borders

The aim of developing a manual for *Imagining, Designing, and Teaching Regenerative Futures* was to foster just, sustainable and desirable visions of the future and support educators worldwide in using art-science approaches for this endeavour. We aimed to compile and make available creative and imaginative approaches for teaching and learning about regenerative futures across diverse contexts and cultures both within and beyond academic settings.

We launched the project through an open call in autumn 2023. The received and accepted submissions were reviewed and edited in several feedback rounds to ensure coherence in presentation, as well as usability and applicability in diverse learning settings. Contributions needed to be insightful and provide clear guidance. Authors were asked to give a step-by-step description of their tools to increase user-friendliness. Each chapter had to include a brief introduction of the method and an

explanation of its regenerative or transformative potential and how it might be used in a learning or community-engagement setting. If, for example, a workshop design was provided, instructions about the time and material required would be included, as would an illustration of the method's application and an example project. We wanted to empower educators to apply the tools in their practice and teaching spaces.

In almost two years of work, we compiled 65 creative tools developed by 120 contributors from 30 countries representing a wide range of geographical, cultural and disciplinary backgrounds. Most contributors are affiliated with institutions across Europe and North America. The book also includes contributions from Oceania and a smaller number from Asia. While contributions from the Global South remain limited, the diversity of locations and institutional affiliations highlights a growing international interest in regenerative pedagogies and underscores the adaptability of creative educational approaches to a variety of local contexts. The book grew beyond a mere collection of tools into a collaborative effort to foster regenerative futures through holistic, imaginative and creative tools. It became a platform that supports educators in exploring and applying new ways of teaching and learning about regenerative futures.

The book's transdisciplinary approach is reflected both in the tools themselves, which include different kinds of knowledge, and in the diversity of the book's contributors, who bring perspectives from over 25 disciplinary fields. There is a strong representation of social sciences, architecture, urban studies, environmental sciences and creative and performing arts — but also of informatics, engineering, economics, psychology and law. Rather than focusing on a single epistemology or way of knowing, the book embraces a plurality of voices, positioning regeneration as an inherently interdisciplinary and inclusive process. In doing so, it creates space for integrative, creative learning that bridges science and imagination, systems thinking and embodied experience, community practice and individual reflection.



Figure 2: Mapping pedagogical themes and competences across the book

The tools and approaches are structured according to seven overarching themes and sections:

- Building communities: collaborative decision-making and participatory learning;
- Artistic expression and experimentation for environmental change;

- Envisioning tomorrow: scenarios and possibilities;
- Enhancing wellbeing: experiential learning and nature connection;
- Playful learning and interactive digital tools;
- Complexity and integrative thinking;
- Innovative pedagogies for regeneration and societal transformation.

The sections are intended to help readers navigate the book. To facilitate user-friendliness, we developed an additional complementary resource, a toolkit that facilitates identifying the relevant tools for a specific learning context with the help of tags, tables and graphical material (Ristić Trajković & Bentz, 2024).

Cultivating hope: the role of community, creativity and care in regenerative pedagogies

The tools in this collaborative book invite educators to transcend traditional boundaries between disciplines, between humans and nature, and body and mind, while drawing attention to the community, creativity and care. They foster a deeper understanding of interconnected systems, the ability to anticipate and envision change, applied skills to navigate complexity and the reflexivity necessary to reimagine our relationship with the natural world. In alignment with the recommendations of the *No Limits to Learning* report, such learning is not limited to formal education; it also encompasses informal and lifelong learning experiences, including hands-on activities and social engagement (Botkin et al., 1979). Adopting such an approach to learning involves new pathways to regeneration and resilience that go beyond traditional educational contexts and affect our societies as a whole.

At the heart of the tools compiled in our book are three guiding principles and values, community, creativity and care, which shape both the pedagogical intent and experiential quality of the approaches. These values are embedded in the lived experience of learning, co-creation and transformation. They provide the ethical and affective foundation for educational practices that aim to be operational as well as meaningful, inclusive and future oriented. Together, they cultivate an orientation towards a future that emphasises belonging, commitment, critical awareness and the capacity to act with care and imagination in response to complex challenges.

Each tool is tagged according to the key thematic elements, competences and pedagogical areas it addresses. These tags help to identify shared orientations across different contributions. They also serve as indicators of those values that are

most prevalent in the application of the selected tools. Many tools overlap across multiple values, indicating that approaches that foster community also encourage creativity and are grounded in care. In this way, the book aims to foster the cultivation of hope through concrete, creative and relational experiences that reconnect learners to each other and to the living world.

Community is one of the most important values and most frequently tagged categories in the book. Tags such as community engagement, participatory action research, collaborative workshops and community-based initiatives reflect the strong emphasis on collective inquiry and co-creation. These approaches invite diverse voices beyond the boundaries of traditional classrooms — including local residents, elders, artists and decision-makers — into dialogues and shared meaning-making processes, creating opportunities for trans-contextual learning. The strong presence of approaches related to transformative learning and community empowerment, reflects a shared pedagogical orientation towards learning as a space for active participation and capacity-building. In many of the illustrated tools, learning takes place in public spaces, non-traditional learning contexts and informal educational settings, where relationships, trust and situated knowledge become central to achieving place-based transformation.

Creativity is central not only to the artistic methods but also to the speculative, future-oriented and experiential approaches that appear across the book. Tags such as creative experimentation, future visioning, storytelling, imagination, visualisation and design thinking indicate an increasing interest in the potential of imagination, embodied knowing and speculative thinking. Creative methods are particularly prominent in approaches that combine emotional resonance with critical inquiry, enabling learners to engage with uncertainty, ambiguity and complexity. Playful tools, such as learning games, serious games, role-playing and simulation, extend the pedagogical potential of creativity into affective, immersive formats. These approaches invite alternative worldviews and new ways of making sense that often remain underexplored in conventional education. The book highlights that imagination, visioning and creativity are regenerative forces. It supports the development of futures literacy and fosters cognitive-emotional flexibility, which is valuable for envisioning regenerative futures. Artistic practices, including storytelling, performance, design and visualisations, support a deeper engagement with uncertainty while also making abstract ideas more tangible and emotionally resonant.

Care as a transversal value appears both implicitly and explicitly across multiple approaches and themes. Although it is less frequently named as an explicit tag, it is deeply embedded in categories such as empathy and perspective-taking, learning

from nature and wellbeing practices. These approaches cultivate relational awareness to oneself, others and the natural world. Care-based methods often blur boundaries between inner transformation and external action. Embodied and sensory pedagogies, such as embodiment practices and learning in nature, enable learners to develop contextual awareness and emotional resilience. They invite slowness and reflection as educational values. Importantly, care also underpins the collaborative and ethical frameworks of the book itself. Its inclusion of diverse voices and its openness to cultural and epistemic plurality demonstrate that regeneration is rooted not only in innovation but in relational responsibility and mutual support.

Reimagining learning for a just, resilient and thriving world

Learning for regenerative futures involves more than understanding the complexities of social-ecological change. It potentially involves lived and embodied practices. Consequently, the tools presented in this book support integrated, experiential learning environments that invite learners to imagine, feel, co-create and act. Grounded in the shared values of community, creativity and care, the tools aim to foster the development of competences that reflect an educational vision anchored in hope, agency, justice and ecological consciousness. The practices and tools collected in the book aim to provide inspiration, as well as concrete examples for addressing the knowledge–action gap across diverse geographical and cultural contexts. Contributions from the majority world highlight that regenerative learning may emerge outside formal institutional settings, driven by community needs and social-ecological vulnerability. In several cases, learning practices integrate traditional ecological knowledge, artistic expression and collective experimentation. These experiences reveal how regenerative practices in the majority world offer critical insights into resilience, care and relationality.

Contributions in the book illustrate how creative pedagogies can actively narrow the knowledge–action gap by transforming abstract knowledge into embodied, collective practice. Tools such as participatory mapping, embodied walks, collective storytelling and artistic experimentation are learning processes that invite participants to move from cognitive understanding towards situated action. Several tools invite learners to engage with local socio-ecological systems through sensory, spatial and relational practices. Participants are guided to experience social-ecological interdependencies through walking practices, sensing exercises or material interventions. The emphasis on experiential engagement enables learners to recognise their own agency within complex systems and to identify concrete points of intervention.

Several reflections emerge from assessing the tools in the context of learning for hopeful futures. Common in their approach is that they involve interconnected competences: many tools integrate empathy, imagination, collaboration and systems thinking into cohesive, relational experiences. This integration enables learners to engage holistically with the complexity of socio-ecological challenges. Contextual and relational learning is also a common thread among many tools and approaches. Place-based and community-embedded tools ground knowledge in lived experience, making learning tangible and actionable. Many tools use collective formats to support shared processes of care, stewardship and engagement for ecological systems. Creative workshops that bring together educators, students, artists and local actors allow participants to jointly define problems, imagine alternatives and test small-scale interventions. Emotional and psychological dimensions also play a vital role. Many tools support trust, vulnerability and relationship-building, reminding us that deep learning does not happen without emotional safety and mutual respect. These insights reflect broader trends in regenerative, holistic and culturally responsive art-science education and practice (Đorđević et al., 2022; Ristić Trajković et al., 2024). Moreover, the successful implementation of such approaches depends on the care and reflexivity of educators and facilitators. Teaching for regenerative futures involves a dynamic, value-driven process that must be cultivated and applied contextually (Nikezić et al., 2021; Ristić Trajković et al., 2021).

The practices presented in this book reveal how action emerges through relational, creative and situated learning processes. By integrating imagination, care and collective experimentation into education, regenerative pedagogies cultivate the capacities required to act within uncertainty and complexity. Across the contributions, systemic barriers such as institutional rigidity, epistemic hierarchies and the gap between knowledge and action are addressed through concrete practices and creative approaches. Many contributions foster epistemic plurality by integrating embodied, artistic, Indigenous and local knowledges, thereby challenging dominant expert-driven models of sustainability education. The tools illustrate how regenerative education can navigate systemic barriers by supporting relationality, creativity and engagement and by building hopeful and transdisciplinary learning spaces for regenerative action.

Reimagining education for regenerative futures is part of a larger transformation. The competences needed to close the human gap require more than skills-based training. They may arise from pedagogical practices that are imaginative, inclusive, emotionally attuned and grounded in mutual relationships. Therefore, the book *Imagining, Designing, and Teaching Regenerative Futures* is meant as an invitation: an

invitation to educators, practitioners and changemakers to reimagine education as a site of collective transformation. Moving into action requires not only knowledge but also the courage to transcend traditional boundaries, the creativity to envision alternatives and the commitment to foster change in community-oriented, diverse, situated and hopeful ways. The book is intended to support educators and learners in exploring new forms of teaching and learning, in working towards futures in which both people and the planet can thrive. Creative, arts-science education, we believe, can cultivate hope and agency. In that way, it can empower young people to become active participants of regenerative futures. As our contribution to a more just, resilient and thriving world, we wish to nurture imagination and creativity in order to strengthen all kinds of initiatives that collectively envision and work towards desirable futures.

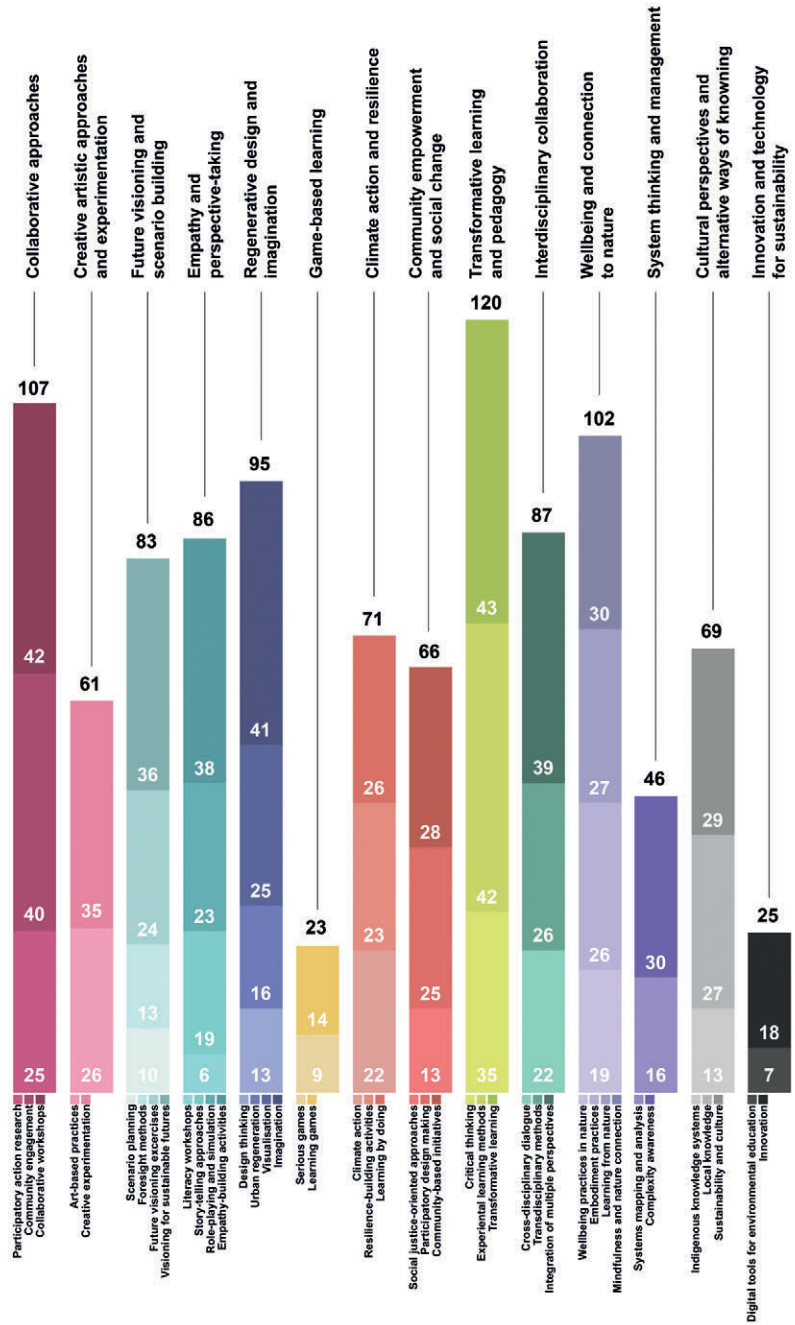


Figure 2: Mapping pedagogical themes and competences across the book

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Unlearning design: catalysing mindset transformation at the postgraduate level through place-based learning, co-creation and more-than-human perspectives

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Abstract

This case study investigates how to catalyse a mindset transformation through place-based learning, co-creation and more-than-human perspectives to develop agency for design pathways with nature and equity at their core. It documents the learning journey of 58 students situated in both high-income and low- and middle-income countries who were enrolled in a module of the MA Sustainable Fashion (online) course at Falmouth University in the UK. This module is designed with and through the dissemination of values like the ethics of care, feminist viewpoints, regenerative principles and rhizomatic learning to leverage the Anthropocene's disruption of natural and societal systems. Seven key methods presented in this article aim to provoke questioning about linear design practices and to create situated system interventions instead. They encourage students to engage with local cultures and traditional knowledge and processes in contrast to taking on a siloed designer-first approach. This can require the unlearning of common practices and hierarchies when students have had traditional design education or prior industry experience. Findings highlight that transformative mindset change occurs when students prioritise processes over physical outcomes; others cherished a deep dive into embodied rituals and traditions to overcome their unfamiliarity with other cultures. Redefining the meaning of a fashion product, students engage in curriculum development, community building, or local policymaking through design. They

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develop local commons, nurture collaboration and facilitate non-linear approaches to systemic change. While the case study is framed by an online learning environment that informs the intercultural educational experience, the discussed methods can be transferred to in situ education and other disciplines too.

Keywords: co-creation, place-based learning, systems thinking, care-led design, transformative mindset change

Introduction

This case study explores the design and delivery of one of the modules in the MA Sustainable Fashion (online) course at Falmouth University (UK) launched in 2023. Offered as an asynchronous learning environment with weekly live webinars and one-to-one tutorials, the course brings together students situated in both high-income and low- and middle-income countries with the aim to catalyse mindset transformation in the context of current prevailing linear fashion design practices. The course has been created to intervene on the growing issues that accompany humans' irreversible interaction with natural resources, known as the Anthropocene (Brookes et al., 2017).

Core to the module is the shared ethos the authors bring to the table, or rather the online teaching medium. It is framed by a vivid concern about increasing volumes of textile waste, social disruption and resource depletion. The shared ethos is also informed by the transgression of planetary boundaries and we articulated these concerns with frequent questions such as *Do we need more stuff? Do we need more garments?* This is contextualised through a care-led practice, which is informed by the work of Jacqueline Millner on caring through arts and social practices, and is built on a foundation of feminist methodologies. Millner argues for both social and the environmental regeneration, positioning care as feminist regenerative practice. Within this concept, Millner weaves an inherently interdependent approach, referencing practices built on co-creation, which is relevant to this module's pedagogical approach and outcome-development strategies (Millner, 2019, p.165).

The module centres around making and involves predominantly practice-led engagement with two assignment tasks, of which the first is to develop a product design proposal that positions process over outcome, vision over feasibility and co-creation over singular design dominance. As facilitators of co-design tied to situated traditional knowledge, students redefine their roles and embrace complexity and pluriversal voices in order to envision projects relevant to local structures yet

anchored in a global more-than-human network. The second task encapsulates five critical reflections written through a more-than-human perspective, with the aim of encouraging the consideration of broader viewpoints in students' design practice. This research highlights some exemplary teaching methods that seek to instigate a different engagement with what design can be, discussed in relation to the method's relevance for transformative learning.

Based on this, the two central questions addressed here are:

- How can educators facilitate transforming mindsets towards developing environmental, cultural and social responsibility through place-based learning and community co-creation?
- How can process and practice-led methods allow for such mindset shifts?

Context

The status quo of the fashion industry mirrors an ill-designed system, a plethora of multiple, often untransparent and entangled subsystems that are sustained and powered by business-as-usual. The need for systemic change is apparent more than ever, including transforming education "as usual" (see Thierry et al., 2023, p. 4). However, mindset shifts to foster systemic change can be challenging to achieve: sparking a different future depends on imagining a different positioning of humans in the world (The Care Collective, 2020, p. 6). Therefore, to move towards design practices flexible enough to address emergence, students need to question the existing while pushing towards the unknown. They could benefit from "making doubt generative" (Locke et al., 2008, p. 911) as an opportunity to overcome knowledge gaps. The recognition of sensory experiences in the form of doubt and the cultivation of those experiences can be utilised as a method to instigate and deepen interest in research (Locke et al., 2008, pp. 911–912). Although often acknowledged as a negative emotion, "(b)y turning toward not knowing, it becomes more [...] likely that we will explore, modify, or transform our prevailing beliefs" (Locke et al., 2008, pp. 913–914). Smith punctuates this idea through a core philosophy in her seminal work *Decolonising Methodologies*, key to this module's approach. She articulates the necessity of "openness to unknown possibilities" (Smith, 2011, p. xii). Thus, where doubt is nurtured as a form of positive disruption, it offers a generative element, here redefining the fact that (fashion) design equals facilitation, letting go of designer-centric practices and choosing the relevance of place to respond to authentic problems instead (see Vander Ark et al., 2020, p. 2). This questions the individualistic approaches and hierarchies that are common in most fashion businesses which

result in a neglect of those both part of, and beyond, the wider value chain. Even more so, they foster exploitative practices that emerge from profit-driven capitalistic business models, causing a spiralling effect on resource scarcity, neocolonialism and environmental destruction.

While this module does not actively seek to initiate doubt as such, the two assignment tasks and complementary module content foster the questioning and reflection about ideas, interventions and community engagement. They make doubt a companion of the learning experience. Stepping outside of one's comfort zone and experimenting playfully with hands-on practices facilitates what Satish Kumar (2013) describes as a "heads, hearts and hands" learning style, a holistic approach to embodying knowledge construction. This aligns with regenerative education which, among other goals, focuses on the continuous nurturing of relationships with a more-than-human world. It celebrates interconnectedness and emergence and "promote(s) justice, equity, compassion and cooperation" (Ciarlo, 2020). Peavy (2024) understands regenerative education as the intersection of "connection with self," "connection with others," and "connection with nature," which together form an ecosystem of practices and values, instead of remaining distinct entities that are taught in isolation. He suggests that systems thinking, environmental awareness, experiential learning and place-based education connected to real-world issues are significant for the educational framing of more-than-human perspectives (Peavy, 2024).

This understanding of holistic education is tied to acknowledging that knowledge systems are unique to place and culture, beliefs and perspectives (see Turnbull, 2000, p. 19). Therefore, as students are situated across multiple countries and various time zones, they bring different experiences of educational environments but also perceptions of what the world means to them. Encouraging students to connect with others, as Peavy (2024) suggests, invites incorporation of place-based learning as a meaningful way of anchoring the learning experience within individual local and social contexts. Such focus fosters the reinhabitation of place through the identification and recovery of "material spaces and places that teach us how to live well in our total environments," which, in turn, allows knowledge construction to be decolonised (Gruenewald, 2003, p. 9). Therefore, key to teaching this global cohort is creating opportunities for them to explore what sustainability means in relation to their place, culture and community, incorporating lived experiences and pluriversal perspectives. Building trust to enable this kind of culturally responsive teaching (Gruenewald, 2008, p. 151) requires creating a *care-filled* online learning environment, which the author deemed essential for establishing the place-based, intersectional

regenerative educational ecosystem that will be described below.

Methodology

Aiming to offer a nuanced view of reality (Flyvbjerg, 2006, p. 223), this research is grounded in the online MA Sustainable Fashion course. Because of the interdependency between students and staff, this case study utilises an observational approach to avoid imbalanced power dynamics that could have influenced participants' responses. Due to ongoing teaching/learning relationships, the inclusion of direct feedback was not a preferred approach. The interpretation of observational data is, therefore, inevitably formed by the authors' positionalities as white, female educators based in a high-income country. A recorded and transcribed conversation between the authors discussing and reflecting on the methods' impacts was used to capture shortened findings in the context of each teaching method described.

This research draws from working with 58 students in two weekly one-hour live webinar conversations, one-to-one tutorials, their participation in weekly online forums as well as their final submissions at the end of this 12-week module in 2024 and 2025. Located across 16 diverse income-level countries, students join the course with various BA backgrounds comprising fashion design, management, visual communication or environmental science among others. While some transition from undergraduate to postgraduate, most have worked in the industry and collected real-world experiences in their specific subject areas. This diverse and intercultural context shapes the breadth of conversation topics, viewpoints and project pathways which emerge from the teaching methods and wider module content.

If they don't learn to make more stuff — what then?

The module aims to support students in becoming comfortable with shifting, modifying and transforming their prevailing beliefs (Locke et al., 2008) to which unlearning traditional design approaches is key. To instigate this mindset transformation, seven of the key methods that inform the teaching approach are described below:

1. From Eurocentric dominance towards place-based learning

In place-based learning, the local becomes the catalyst for understanding global challenges and opportunities; the learner develops the agency to interact with the community as their learning ecosystem; the systemic and inquiry-based learning approach fosters exploring multidimensional economic, ecological and social layers

linked to local contexts (Vander Ark et al., 2020, p. 3). For this module, students situate their projects in their individual locality. This non-standardised learning, supported by semi-open briefs, emphasises cultural and historical relevance, increases the manifestation of meaningful processes and minimises the risk of imposing a Eurocentric interpretation of what design must look like.

2. From market gap towards community need

The emphasis on designing for community needs supports students in understanding the importance of something that matters to their locality and subsequently the relevance of care that is needed in relation to approach the latter (Vander Ark et al., 2020, p. 65). Students are tasked with beginning to identify their community. To connect with others, they engage with people in their neighbourhood by talking, observing and listening. Depending on their project direction, this includes a more-than-human world directly or indirectly (see points 4 and 6). Their interaction reveals community needs and different cultural practices, often strongly deviating from students' first design intentions, especially when they predominantly considered designing traditional fashion products such as garments.

3. From designer-centric towards co-creation

Co-creation refers to the collaboration between different stakeholders, for example, "artists, local residents, researchers or community groups" (Carpenter, 2020, pp. 173–174), to address societal challenges through a flux of power between the actors and to disrupt knowledge hierarchies. Co-creation does not follow a prescribed format, encouraging concepts to organically unfold as students work towards a final project dissemination in their communities. Students are guided throughout regular touchpoints with tutors and the class, including peer-to-peer sharing of strategies to cope with non-responding community members, with one's own social anxiety or with potential language barriers. Through co-creation, students begin to question conventional fashion design processes which destabilises traditional thinking about what design is (see Carpenter, 2020, p. 182).

4. From goal driven towards hands-on play/experimentation

Five hands-on biomaterial and natural dye experimentation challenges, with waste materials sourced from students' households and elsewhere, accompany the main brief and serve to facilitate playing in opposition to working with a goal-driven mindset. Play, here the experimentation with materials, is generally seen as a flexible activity, an enabler of exploration and creativity (Harris, 2021, p. 1). Spread across the 12 weeks of teaching, these tasks provide moments of wonder that can lead to further exploration (Buchanan, 2007, p. 44). Some students intertwine their experimentation

with their design proposal, and sharing positive and negative experiences both visually and verbally with the cohort fosters the embracing of process over outcome (see point 5) and creates a community of material practice through play.

5. From product towards process

Prioritising process over product aims to shift students' mindset from the *what* to the *how*. With growing knowledge about the need for systemic change, one of the major industry challenges is to figure out *how* to achieve change while *what* needs changing is often discussed at length (for example, reducing production volumes and waste, facilitating environmental and social justice). By encouraging uncertainty and doubt as a generative experience (Locke et al., 2008, pp. 913–914), students allow themselves to listen deeply to their communities and to minimise and manage their own expectations. Because the first brief encourages processes and explicitly invites questions on the definition of a fixed outcome, students open their minds to new pathways that emerge from co-creation practices; they begin to explore multiple options of the *how*.

6. From human-centred towards more-than-human

The second brief, writing reflections through the more-than-human lens of students' biomaterial or natural dye developments, requires that students acknowledge the multiplicity of ways of sensing, the philosophies and experiences of diverse ways of being. This task leans towards shapeshifting, the act of inhabiting or shifting into the perspective of the nonhuman, giving up one's point of view by relating to others and developing "radical" compassion (Smith, 2021, p. xii). When this is developed, it triggers transformation in response, a process described by Anzaldúa (2002, p. 569) in the context of Mexican Indigenous shaman practices. In this brief, shapeshifting is applied to encourage exploring relationality, the existence of multiple realities (Law, 2015, p. 136) and how holistic design ethics can and must include the more-than-human world instead of following a solely human-centred approach.

7. From siloed focus towards systems thinking

Amongst other main characteristics, systems thinking refers to the ability to identify interrelationships and their dynamics, to understand complexity and to consider multiple perspectives (Squires et al., 2011). Students approach their projects through embedding interdisciplinary viewpoints, including the more-than-human and through mapping, respectively, understanding their community first. This is followed by continually reviewing different intervention proposals and their

regenerative potential, complemented by an intersectional life cycle analysis (Stanford University, n.d.) that covers both the environmental and the social impacts. Their projects' nexus to local systems tied to the global picture questions the siloed focus of the designer which, traditionally, is common in linear industry practice.

Summary

The seven briefly outlined applied methods shape place-based learning that focuses on community needs, co-creation and hands-on play/experimentation. They emphasise processes, more-than-human perspectives and systems thinking. Utilising these methods has resulted in unique projects which are informed by place, culture, beliefs and perspectives (see Turnbull, 2000, p. 19) and which have become an additional learning resource for peers in live sessions or through online forum exchange. In the following, teaching observations and insights collected from students' submissions are shared to highlight how they stimulated mindset shifts.

Discussion

From Eurocentric dominance towards place-based learning

Over the course of the project, many students had an organic shift away from Eurocentric perspectives. For example, through engaging with their local Vietnamese or South Korean communities or with their own cultural heritage, some students facilitated projects beyond familiar language and cultural systems. This transformed their approach way from one based on hierarchical power structures; instead they flattened their own voices, leaned in and amplified their communities' visions. Here, a shared means for communication became the materials, new tools and practices expanding their learning to create a symbiotic relationship among relevant stakeholders. These shifts occurred due to working directly with a place-based community and not in isolation, building inherent and embodied knowledge of the location and culture. Place-based learning informed students' acknowledgement of local value as part of the design process and seeing the relevance of embedding a pluralistic lens in order to create a jointly agreed upon project outcome. It also supported embracing one's own diasporic values.

From market gap towards community need

By interviewing their local communities, students explored potential interventions for real needs emerging from unique climate conditions, resource availability and demographics such as age. At times students found this challenging: initial design ideas that developed in one context contrasted with explicit community feedback. Student's ideas were identified as failing to address needs such as adaptation to climate change and resulting healthcare issues; and so students changed the direction of the project as a means of caring for their community. Reflecting on participants and locality supported more meaningful products such as agave waste sun hats, a shared community loom, educational workshops or vegetable stain-covering textile pens. Instead of catering to market niches, design proposals were shaped by community voices and not just aesthetics or perceived fashion trends. This had a knock-on effect on understanding the role of degrowth for societal wellbeing; in contrast, upscaling unit numbers is often associated with success in common fashion systems and economies. What was proposed filled succinct niches and therefore influenced the scale of resource use. Moreover, moving towards community needs meant, in fact, also moving towards market gaps at smaller scales, thus feeding into a different economic paradigm.

From designer-centric towards co-creation

Collaboration involved the experience of having to let go and be challenged by members of the student's community who did not respond to emails or suggested a different approach. By exchanging experiences and sharing best practices with their peers, students slowly took on an appreciative position of decentralising themselves. To some, co-creation meant mapping the current community landscape, including the more-than-human, which was enabled through embracing empathy for the other. Students also took on different, partly unfamiliar roles including becoming a facilitator, interviewer, disseminator and co-creator and at the same time challenging their preconceptions of a designer's role. One student worked directly with their community to establish a fashion commons and natural dye garden with the aim to facilitate understanding ecosystems and share co-created knowledge with audiences beyond the collaborating team. By disseminating their democratic project development, they influenced the wider community on an educational level, distributing agency from self to community. Across the sample group, students found that collaborating with others required a notion of care and relationality which they applied to their projects and their stakeholders alike. According to Robinson, these ethics of care show "a commitment to a slow process of listening to needs, building trust, and rebuilding relations and institutions for the long-term well-being of societies" (2011, pp. 103–104).

From goal driven towards hands-on play/experimentation

Experimentation without standard assessment formats encouraged trust and collaborative approaches between tutors and students. This helped to unravel a results-based value system based, which obscures the inherent value of expansive or experimental practices in the design process. Students came to see that hands-on play encouraged openness and positivity about uncertain outcomes and processes. For many students, particularly those not from a design background, the dyeing and biomaterial development, which was part of the second brief, was unfamiliar, and it provided an opportunity to play hands-on and to experiment with dyes and green matter free from predefined goals. Although not a requirement for the main design proposal, some students included their experimentation, leading to STEAM-driven proposals. For example, one project took an interdisciplinary approach according to which the student (working as an educator) collaborated with art, engineering and print technicians. Having to overcome communication issues, the student collected various voices and embedded their expertise into developing biomaterial-based lino plates. These were combined with vegetable and plant inks which could potentially be grown directly on campus to facilitate pupils' understanding of the systemic nature of print design. The student successfully catalysed their MA learning experience to create educational materials that influenced their institution's art curriculum, seeking wider impact by proposing to share recommendations with a higher educational authority. This project demonstrated how, by incorporating playful and experimental processes, students can instigate far-reaching consequences at local, institutional and policy levels.

From product towards process

Design students, in particular, found expanding notions of outcome away from product to be a difficult experience at the start. However, over time, many projects became about critiquing the purpose, scale and function of design, particularly in relation to common linear designer-centric and market-gap-driven practices. For example, one student looked at locally available waste resources in Northern Ireland, particularly blue mussel shells. They utilised biomaterial experimentation to develop a blue mussel bio yarn for weaving, which emerged from their deep understanding of their craft and practice — but also through the testing and iterative process itself. This engagement with waste resources guided the student towards finding further opportunities to reduce waste in manufacturing textiles. The student experienced a practice-led approach, collaborating with various technical experts and non-experts to modify their loom's reed, with the purpose of reducing textile waste already in the weaving process. As a cross-pollination between them and technical experts,

the successful collaboration led to encountering a transformation within their own textile practice. It organically evolved from the initial engagement with experimental bio yarn development in contrast to traditional wasteful design approaches.

From human-centred towards more-than-human

Decentring themselves in their projects, through collaboration and reflective writing, allowed students to question their binaries of understanding community, self and more-than-humans, viewing these as fluid systems. One student explored the relationships between the systems of soil, field, farm and fibre by cultivating cress into now-living knitted woollen textile samples. The probes they provided to the community invited users to interrogate interactions between the human-body and living knitwear. These conversations unpacked the role of the more-than-human in a speculative fashion scenario, challenging the traditional notion of the customer by becoming the steward of living systems. Accompanying writing encouraged the student to take on the lens of their materials, such as trees, plants, wool and biomass to critique existing design and material practices. As methodologies of care and stewardship required to sustain the living system and to empathise through the perspective of other ecosystems, these reflections evoked mindset shifts in the student towards expanding human-centred design to more-than-human approaches.

From siloed focus towards systems thinking

Both briefs foster learning that is deeply connected to stakeholders, co-creators and more-than-human collaborators while encouraging personal growth. Moving from self to understanding design practice as part of a bigger entity, students interrogated how design can be anchored in systemic change through its multilayered relationships with the environmental, cultural and social. This was exemplified in projects which aimed to integrate the collection of local food waste into the development of biomaterial fibres through anaerobic digestion or to challenge infrastructural and cultural gaps for textile recycling systems in Turkey. Here the student recognised that in their municipality there was no textile recycling system. As the country is a significant garment manufacturer, recycled fashion was seen as not culturally acceptable. Nevertheless, the student demonstrated the importance of highlighting disposal practices and the systems that are needed to implement recycling processes. Working holistically was underpinned by a negotiated understanding of sustainability across the community. Used to following their own viewpoints, students took a variety of stakeholder perspectives into account, enabling a shift towards systems thinking and a movement towards projects that look beyond the self. Overall, students felt inspired by the integration of material flows and the

incorporation of traditional knowledge systems. Responsive as agile interventions within both the food and textile industries, they organically created meaningful local systems change.

Conclusion/Recommendation

Moving from an online context to education being placed in situ will likely influence the dynamics of the methods described above. While the online environment allows for a global audience, thus enriching perspectives in the virtual classroom, it also limits the intercultural exchange to fewer live contact and in-depth debates that would potentially develop differently in an extended on-campus situation. However, the latter might also come with a more homogenic demographic and potentially lower students' cultural experiences. On the other hand, focusing on the same geographical environment can bring its own benefits — for example, revealing multifaceted community layers through synchronised place-based learning. Although this case study is centred around postgraduate fashion design education, the shared methods are modifiable and transferrable to other subjects, briefs and learning contexts.

Due to the trust and agency given to the teaching team by the institution, no scepticism or resistance was encountered with the module briefs and therefore the teaching approach was based on shared core values. Overall, findings of discussed observations demonstrate an increasing "openness to unknown possibilities" (Smith, 2011, p. xii), which became the strength of students' projects. Over the course of the module, transformative mindset change towards environmental, cultural and social responsibility emerged from the key methods. Students applied agile systems thinking through co-created design, which was refined to become relevant to real-life contexts. Working in unique local environments enabled them to not only respond to their communities' needs but to question the discipline of design as such. Making the designer's role more than a solely a creative one, students became facilitators, listeners, co-creators and amplifiers of their local communities. Tutor care-led guidance allowed less confident students to move through uncertainty, towards the actively embracing of doubt as a generative tool (Locke et al., 2008, p. 911). This flattening of hierarchies enabled new ways of engaging with designing. This decentring of the self positively influenced students in prioritising processes over physical outcomes, while others learnt from unknown rituals and traditions to overcome their unfamiliarity with other cultures. The key ideas of care and empathy and of lessening one's own ideas to amplify the voice of the community stimulated students' personal growth and strengthened relations beyond the human world. Continuous reflection and questioning of whether interventions fulfilled their purpose shaped a conscious

awareness of the roles they embodied as designers, providing them with a greater understanding of job opportunities in a fashion system that needs to transition towards both economic degrowth and environmental and social justice.

By organically redefining the meaning of a fashion product by applying a broader definition that opened up multiple ways of embedding local relevance, students engaged in curriculum development, STEAM related projects, or community building instead. They co-created commons, nurtured intercultural collaboration and proposed ideas for non-linear approaches to situated systemic change, instigated by the translation of the intersectional regenerative educational ecosystem embedded in this module. While many projects had a strong emphasis on disseminating co-created knowledge, all students but a few challenged the *what* and turned towards the *how* instead. By allowing design to unfold from place-based needs serving as a response to authentic problems (see Vander Ark et al., 2020, p. 2), students implemented collective local visions brought together by bridging diverse stakeholders. Early wider impact was shown when students built partnerships that created links to and for new bio-economies around local community members resulting in educational and policy shifts. Unlearning traditional human-centric linear design processes through synchronising creative processes with the more-than-human locality pushed personal and disciplinary boundaries. Moreover, it sparked students' interest in continuing their community interactions that, in some cases, led to positioning their final dissertation projects within their co-design communities-in-becoming. From here, the module looks to further develop initial adaptations to student-led delivery as a pedagogy of reflexive co-creation methods, amplify the importance of uncertainty in the students' awareness of the process in an anticolonial context, and continue guiding interdisciplinary, intercultural *care-filled* community engagement methodologies with a more-than-human range of delivery collaborators.

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Addressing planned obsolescence through radical imagination

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Abstract

This article presents an action research case study that uses planned obsolescence (PO) as a tangible entry point to critically examine the dominant logic of disposability embedded in education. Over 18 months, students at a Dutch University of Applied Sciences engaged in a co-inquiry developing a tabletop role-playing game. Through this process, students interrogated the systemic roots of PO and reimagined their roles as future professionals. The project underscores the necessity of radical imagination in education as a means to resist defeat.

Keywords: Planned obsolescence, radical imagination, critical pedagogy, game-based learning, case study

Introduction to planned obsolescence

In the literature, planned obsolescence (PO) refers to the deliberate strategy of developing products with limited lifespans, rendering them non-functional or undesirable in order to drive repeat purchases (Bullow, 1986). PO is categorised into two main types: absolute/functional obsolescence — products designed to fail or become irreparable — and desirability-based/psychological obsolescence — products made to seem outdated, encouraging disposal despite functionality (Packard, 1960; Longmuss & Poppe, 2017).

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While absolute obsolescence often draws regulatory and activist attention, desirability-based obsolescence poses a more significant issue, as it is likely to have a bigger impact on product lifespans and the responsibility for this type of obsolescence is more obscure (Cooper, 2004). We use PO in research and education as a lens to reimagine our relationship with material culture. PO is visible in everyday life, evoking frustration that fuels critical reflection. Addressing PO beyond the notion of an evil business practice requires challenging the values, practices, structures and narratives that normalise disposability.

The historical origins of (planned) obsolescence

We give a very brief overview in this section, which is also how we talked about the history of PO with students. Before obsolescence was planned, it was a byproduct of what we like to call progress. Regeneration, repair and reuse were common and necessary because people in pre-industrial societies relied more on labour and nearby resources. As machines began to mine, produce and ship materials and goods faster and cheaper, and as colonialism expanded, the pace of "innovation" accelerated.

As industrial capitalism matured, some began to recognise that obsolescence could be engineered, not just accepted. One of the earliest and most explicit articulations of PO came from London (1932), an American real estate broker, who proposed that the government should mandate obsolescence to stimulate economic recovery during the Great Depression. While his proposal was disputed, it laid bare the logic that underpins consumer capitalism: perpetual consumption as a means of economic stability.

Though articulated in the '30s, there are two influential examples that emerged in the '20s. The Phoebus Cartel colluded to cap light bulb lifespans at 1,000 hours (Slade, 2006). Meanwhile, General Motors introduced annual car model changes. Not for functional upgrades, but to render older models unfashionable (Whiteley, 1987). This strategy countered Ford's durable, unchanged Model T, which dominated until declining sales made Ford adopt GM's approach in 1927 with the Model A, marking its entry into the cycle of regular model updates.

These two early examples are worth highlighting because they illustrate two distinct types of PO: the Phoebus Cartel represents absolute obsolescence, while GM's strategy for desirability-based obsolescence appears more rational and culturally acceptable.

Who plans obsolescence?

The paper that poses the excellent question for critical and systemic reflection is "Who Are Those Planners?" (Longmuss & Poppe, 2017). While designers are often seen as key actors, their decisions are shaped by market competition, shareholder demands and global capitalism. Design outcomes often result from pressures like rapid innovation cycles and cost constraints. Governments contribute through weak regulation and law enforcement and emphasis on GDP growth and employment. Consumers reinforce norms of novelty and disposability stimulated by media and constrained by opaque information, social expectations and norms (Shove et al., 2012). Asking the question of who plans obsolescence and trying to respond in dialogue with students, reveals how deeply embedded PO is in today's production and consumption systems; coordinated efforts will be required to address it.

Environmental and social implications

We asked students to consider the consequences of PO. The most top-of-mind consequences were environmental: resource depletion, unnecessary energy consumption (and thus climate change), and the generation of waste. Today, our soil, water and air — even our animal and human bodies — contain persistent pollutants, such as forever chemicals and microplastics. Unlike past materials, these will remain for centuries.

Less mentioned is that this sedimentation is also political. Colonial extraction and domination created the conditions for PO, and its impacts are uneven (Birkmann et al., 2022). Low-income countries bear most of the burden, facing environmental harm, economic dependency and cultural erasure. Waste disposal is often outsourced there (Basel Action Network, 2019), contaminating soil and water and exposing workers to toxic substances, with little protection provided.

Though less apparent and lethal, PO-driven social injustice in high-income countries is noteworthy, especially as our students have a direct experience with these consequences. PO fuels rising consumer debt, especially among young people (Rijksoverheid, 2025) who are pressured to keep up with fast-changing tech and fashion. Many rely on credit, deepening the financial strain amid an already inaccessible housing market. Moreover, modern product design often blocks repair or modification (Barros & Dimla, 2021), stripping consumers of autonomy and enforcing a passive, wasteful relationship with their material world.

Growing resistance

Because of all these consequences, resistance is stacking. The global Right to Repair movement pushes for access to tools, parts and knowledge to fix devices independently. The EU has introduced stronger legislation, banning products with artificially limited lifespans and requiring accurate durability information. But as we came to understand PO as a systemic issue, we believe that these efforts are merely addressing absolute PO, and merely as a symptom. To go beyond, we need truly alternative imaginaries.

Alternative imaginaries

The circular economy, often presented as transformative — an idea we dispute, aims to minimise waste and extend resource use. The famous R-ladder prioritises actions on impact (Alivojvodic & Kokalj, 2025). But climbing the ladder is difficult. Higher steps require business model overhauls or abandoning consumption altogether. Lower steps depend on advanced costly infrastructure. Underpriced raw materials reduce incentives (Kirchherr et al., 2017). Meanwhile, consumers tend to favour convenience and novelty, which are enforced by marketing and an abundance of disposable goods (Du Bois & Dewit, 2025).

While the circularity gap report states that the circular economy is going in reverse (Circle Economy, 2025), the idea of sufficiency calls for a fundamental rethink of production and consumption (Suski et al., 2023; Gossen & Niessen, 2024). It requires structural shifts in economic organisation, success metrics and societal desires around the notion of enough and must be supported by policies like reduced working hours, fair resource distribution and infrastructure for low-consumption lifestyles.

As a third alternative, regeneration offers a compelling framework that moves beyond the logic of minimising harm to embrace active restoration (Fischer et al., 2025). Regeneration asks us to fundamentally reimagine our society and ecosystem as living, evolving entities capable of healing and renewal. Yet, it must be approached critically. Regenerative language has been co-opted by corporate actors to greenwash (Feghali et al., 2025).

The final alternative we introduced to students (less common in this context) is conviviality, as articulated by Illich (1973). Conviviality reimagines our relationship with tools and each other, emphasising the ability of communities to shape their material environments, rather than being shaped by institutions. People are active

participants in creating, maintaining and transforming their worlds, not passive consumers.

Co-inquiry

This section introduces our action research project which resulted in a tabletop role-playing game. The game emerged organically from a shared investigation into how PO is embedded in curricula and the need to spark imagination, as PO is often perceived inevitable. Our approach is therefore rooted in critical pedagogy and radical imagination.

Critical pedagogy, as introduced by Paulo Freire (1970), positions education as a tool for challenging and transforming oppressive structures. In line with this and with action research principles, students were treated as co-researchers. Their chosen directions of inquiry emerged through dialogue. Students were also asked to reflect on their emotional and intellectual responses throughout the project. Inspired by Haiven & Khasnabish's (2010) theory of radical imagination, we see this concept as a collective, transformative practice. Radical imagination is about combining the envisioning of alternatives, while actively challenging the structures that suppress them. For us, this means using PO as a lens to expose the absurdity of a system built on disposability, while simultaneously creating spaces — within our co-inquiry and our tabletop game — where students and communities can experiment with new thoughts and feelings. Radical imagination is fragile and easily drowned out by louder narratives often represented by "the realists" in a dialogue. In a world fatigued by crises, hope can seem naive. To protect it, we had to gently press into the unconventional and nurture its unfolding with care.

In the context of business education, we collaborated with three successive groups (4–6) of students pursuing a minor in business leadership and sustainability. We collaboratively explored how the logic of PO was present in business education. Parallel to this inquiry, three pairs of communication & media design graduation students engaged in critical and speculative design projects that addressed PO from multiple angles.

Pedagogical experiences

The project revealed that students, through their engagement with the topic of PO, began to ask deeper questions about their relationship to products, producers and the broader production-consumption system. Students started to interrogate the dominant narratives they encountered in their education, particularly the implicit

assumptions embedded in curricula.

The way of co-inquiry was unfamiliar and initially unsettling. At one point, a student hesitated: "But you know everything already." It wasn't dismissal, but self-doubt. We saw this as a key pedagogical moment. Instead of reinforcing the expert-novice divide, we encouraged her to see her perspective as essential. These kind of hesitations and lived experiences weren't distractions. They were the topic.

A remarkable aspect of the process was the emotional and intellectual gravity students felt about the task. Grappling with PO's complexity proved deeply challenging. One student called it a "nearly impossible assignment," another, "a torture for the brain." These were not complaints but honest reflections about confronting a problem that is both visible and obscured. Some avoided the topic at first. "This wasn't my first choice," one admitted. "Not even my second or third." Wrestling with PO pushed students beyond surface-level engagement. Rather than simplifying the issue, we encouraged students to resist easy answers.

Students initially found PO complex, but by the end of the project, many described it as concrete and relatable. In their reflections, they saw PO as a surprisingly effective starting point for creativity and critical thinking. Unlike more abstract issues like climate change, PO felt tangible and connected to daily life, evident in examples like fast fashion or prematurely failing appliances. This familiarity helped deepen engagement, despite the cognitive and emotional demands. For some business students, it offered a refreshing contrast to the technical focus of their curriculum, opening space for imagination and critique. PO was seen as a long-term challenge that could inspire sustained engagement. Its relevance to business strategy made it feel applicable to their future roles. Students appreciated that it was both specific enough to grasp and broad enough to explore from multiple angles.

Participating in the research became, for some, an experience that "could not be unseen." Once students grasped the logic and absurdity of PO, they began to reflect on the education that prepares them to participate in the systems that produce PO. Some even reconsidered their study or career paths. This effect affirmed PO's value as a powerful lens for critical pedagogy, showing that education can be a space for questioning dominant logics rather than reproducing them.

Embeddedness in the current curriculum

Our minor students concluded that their curricula were rooted in economic values that produce PO: growth, competition and efficiency. Students and teachers described this as double-messaging. Sustainability is mentioned, yet the tools and models taught continue to reinforce extractive, short-term thinking. Concepts like product lifecycle

management and competitive strategy are illustrated by examples that frame success and failure. An example is the narrative that sees Nokia as the "loser" and Apple as the "winner" in the mobile phone market, which implicitly celebrates rapid product turnover and consumer lock-in (Ribeiro et al., 2025). Apple's success is framed as its ability to sustain sales through constant renewal, while Nokia is portrayed as having failed to keep pace. PO was never explicitly embedded in the curricula under review. Despite initial discomfort, many first-year business students — who engaged with our minor students — expressed a desire to see PO explicitly integrated into their education.

Another recurring theme was the dominance of consumer responsibilisation (Maniates, 2001; Giesler & Veresiu, 2014). Sustainability was often framed through individual choices: what to buy, how to recycle, how to consume more "consciously." This made it difficult to imagine that other actors could or should behave differently. The idea of "green consumerism" felt most familiar and accessible.

Addressing alternatives for radical imagination

We have found the concept of conviviality especially powerful for radical imagination. When grasped, it can significantly expand students' thinking. Unlike frameworks like circularity or regeneration, which often remain tied to market-based logic, conviviality invites a more radical shift. Conviviality resists the logic of mainstream sustainability in high-income countries and remains less co-opted. However, conviviality has been shown to be difficult to grasp precisely because it challenges dominant paradigms. It questions assumptions about progress, ownership and skill. For students used to thinking in terms of efficiency and scalability, it can feel abstract, even disorienting. But this unfamiliarity is both a flaw and a feature. As such, we believe it benefits from experiential learning that allow students to engage with its implications.

Co-developing educational materials

As part of the project, students were invited to co-create educational materials that critically engage with PO. This process became a learning experience in itself. Students reflected on how knowledge is framed, communicated and taught. They learnt to translate complex ideas into accessible formats: lesson plans, visual aids and discussion prompts. Yet, the process also exposed the limitations of conventional education. With few examples to draw from, students found that critical thinking and imagination are rarely activated. As they designed for others, students became more aware of how they themselves learn.

The emergence of the game

As the inquiry progressed, the idea of creating a game emerged. The game had to become a space where other students, beyond the groups directly working with us, could get frustrated about PO, inhabit roles and experiment with alternative imaginaries. The game had to disrupt dominant narratives of competition, growth, efficiency and individualism, opening space for radical imagination. Choosing a tabletop role-playing game (TRPG) reflected students' desire for an immersive, participatory and open-ended experience.

The game's development became a collaborative project with our most recent group of minor students. Its mechanics and narrative were shaped by themes from earlier phases of the inquiry. Play-testing and iteration were central: together with students we tested early versions and gathered feedback on gameplay and thematic clarity; students contributed podcasts and instructional videos. The game continues to evolve via the insights and questions that emerge during every round of play.

Game description and design choices

The TRPG, provocatively titled *We've Had Enough! The Game*, simulates a collaborative effort to dismantle the "mountain of waste": a physical metaphor for PO. Players begin by selecting a product category (e.g. fashion, electronics, food) and adopting diverse roles (entrepreneur, NGO, repair person, teacher, activist, etc.), each personally developed by players through persona cards that foster empathy and perspective-taking. Every role holds meaningful agency, which is a pedagogical choice. Systemic outcomes like PO are often framed in ways that render some actors powerless. It also builds empathy by helping players identify with a role they do not have in real-life. Early in development, some students suggested roles should be housed within the same institution for easier collaboration, but by spanning institutional boundaries, players explore unexpected synergies and challenge the competitive logic that dominates many systems.

A key feature of the game is that players generate ideas not in the abstract, but through the specific agency of their chosen role and the group's product category. The game master facilitates dialogue to help players explore how their ideas intersect. These prompts surface synergies and tensions, encouraging systems-level thinking where the strength of an idea lies in how it aligns with others. It highlights the interdependence of roles and the need for coordinated action.

Throughout the game, system cards introduce real-world disruptions (policy

shifts, media attention, social movements), which categorise outcomes as "success" or "fail." In reality, it is rarely so clear-cut; most initiatives fall into grey zones of partial progress and contested outcomes. To reflect this, the game master facilitates dialogue around what success and failure mean in complex systems. Players consider unintended consequences, resilience and adaptation. This mechanic becomes a prompt for deeper thinking, reminding players that even "failed" ideas can spark insight and that "success" often requires ongoing negotiation and iteration.

The game ends when time runs out emphasising that systemic change is an ongoing process. The game master guides a reflective dialogue, inviting players to step back from their roles and consider what they've learnt: Which strategies felt promising? How did collaboration shape outcomes? And what might these insights mean beyond the game? This reflection is essential. The game master encourages participants to articulate what they now feel compelled to question, resist or pursue.

Next steps

By treating students as co-researchers and using PO as a lens, we have begun to disrupt the logic of disposability within our curricula. The project's focus on PO has revealed the urgency of challenging dominant narratives in business education and beyond. To build on this foundation, the next phase should prioritise a more explicit integration of critique and imagination into our curricula and pedagogical practices. We learnt that alternatives to PO — especially conviviality — offer a rich ground for ideation. Future work could delve deeper into how they can be operationalised in learning environments. For example, action research projects could pilot convivial learning tools. These initiatives could serve as living laboratories for students to engage with the complexities and possibilities of alternative imaginaries. For alternative imaginaries, we must look closer at the traditional ways of living that have long resisted disposability. Traditional practices and knowledge teach us that another world already exists and has existed for centuries. Our task is to listen and learn with humility.

We also learnt that engaging with PO evokes a range of emotions. Future work should attend to students' emotional wellbeing as they grapple with these challenges. We learnt that incorporating reflective practices — such as journaling, group dialogues and co-creation — can help students process their feelings and sustain their commitment to change. Additionally, framing radical imagination as a source of agency and possibility, rather than as a critique of the present, can cultivate a sense of hope and resilience.

The TRPG demonstrated the power of experiential learning in fostering radical imagination. To amplify its impact, the game could be refined and adapted for diverse audiences. For example, we introduce the grass-roots roles in the game as a second axis of role identity, allowing players to explore beyond institutional positions. Enhancing classroom usability remains key, with modular formats and clearer facilitation tools. To sustain engagement with the topic, we aim to connect the game to existing curricula, guiding students towards deeper inquiry through follow-up resources and courses. To extend the impact of the game beyond higher education, we also aim to develop a professional learning version tailored to lifelong learners. This version reframes PO as a strategic, ethical and systemic challenge relevant to professionals so the game can become a tool for critical reflection, cross-sector dialogue and transformative action in real-world contexts.

A closing remark

By treating students as co-researchers and using PO as a lens for inquiry, we disrupted the traditional hierarchy of knowledge and fostered a culture of collective critical thinking. Moreover, our inquiry was not focused on "fixing" PO but on reimagining the values, structures and narratives that make it seem inevitable. In doing so, we have learnt that radical imagination is necessary to prevent cynicism and defeat. Radical imagination is the soil from which more just and caring futures can grow. This way, education becomes a lever for systemic change, not a means for individual advancement.

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Creative methods for biodiversity governance: a critical and inclusive approach to participatory learning

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Abstract

This article examines the design and development of an open-access online training course that aims to support inclusive and critically engaged biodiversity decision-making by enabling the uptake of creative and participatory intervention methods. Designed as part of the PLANET4B project (understanding Plural values, intersectionality, Leverage points, Attitudes, Norms, behaviour and social lEarning in Transformation for Biodiversity decision-making), the course draws directly on grounded insights and practical experiences from 11 place-based and sectoral case studies. The article argues that biodiversity loss is not only a techno-scientific empirical issue but a deeply relational and structural challenge requiring disruption of both exclusionary norms and hierarchical knowledge systems. An adapted version of Donella Meadows's leverage points offers a framework to trace dynamics of change while accounting for intersectionality and situated power relations. Building on this framework, the article offers a critical appraisal of creative, discursive and experiential methods, emphasising the importance of designing and implementing approaches so that they address structural inequality, support reflexive practice and foster place-based engagement. These conceptual ideas are translated into practice through a bespoke course design targeting four sets of key enabling players: policymakers,

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business, academic researchers and civil society. The design is informed by a clear rationale, a set of method-selection criteria and a framework for sharing and adapting the selected methods. By way of illustration, the discussion focuses on three methods featured in the online course: the *Who Am I?* game, participatory theatre and debriefing. The article contributes to broader debates around the democratisation of knowledge, the politics of participation and the role of learning in advancing ecological justice. It aligns closely with the ethos of No Limits to Hope, offering grounded tools and perspectives for understanding and enabling transformations in biodiversity governance.

Introduction

Biodiversity loss presents an existential, wicked problem, necessitating a radical rethinking of how societies learn, govern and make decisions (IPBES, 2019a, 2024). But responses to the biodiversity loss often fail to address the direct and indirect drivers or to foster meaningful public engagement, resulting in solutions that lack cultural resonance, local ownership and long-term effectiveness (Davila et al., 2021; Barton et al., 2024). Thus, despite the urgency of the biodiversity crisis, the direct and indirect drivers of biodiversity loss persist with little disruption, further entrenching the enduring disconnection between knowledge and action (IPBES, 2024).

To navigate the disconnect between engagement and decision-making, attention is increasingly turning to creative, discursive and experiential methods (hereafter collectively referred to as creative methods) that challenge conventional ways of knowing, communicating and practicing (Leventon et al., 2021; Franklin, 2022). Such methods can cultivate emotional connection, cultural resonance and collective imagination. They can also be used to challenge technocratic policy routines which are embedded within broader neoliberal governance logics that marginalise them (Fischer & Riechers, 2019). The PLANET4B project (understanding Plural values, intersectionality, Leverage points, Attitudes, Norms, behaviour and social lEarning in Transformation for Biodiversity decision-making) contributes to this prescient field of research by exploring whether and how creative methods can catalyse deeper, more inclusive forms of biodiversity decision-making. Involving 16 international partners and running from 2022–2025 PLANET4B has adapted and piloted a range of creative methods across many of its 11 place-based and sectoral case studies.

Drawing on Donella Meadows's (1999) concept of leverage points, the PLANET4B project asked whether such methods can be used to intervene not only in the flow of information but also in the deeper paradigms and goals that structure decision-making systems. The literature suggests that when used "care-fully" (Franklin, 2022; Moriggi, 2022), some creative methods, particularly those that foreground diverse forms of knowledge and experience, can enrich scientific understanding, challenge exclusionary epistemologies that privilege technocratic expertise and begin to shift mental models and collective goals in support of ecological regeneration (Abson et al., 2017; Smith et al., 2017; Zolyomi, 2022). But, as this article explains, creative methods must be used with critical intentionality. Without care-full design facilitation and responsiveness to local context and wider socio-cultural dynamics, they risk reproducing the extractive or tokenistic practices that they are purported to redress (Barton et al., 2024; Moriggi, 2022).

Building on these concerns, this article traces how insights from PLANET4B have been translated into an open-access online training resource for local policymakers, civil society actors, business sustainability champions and academic researchers. The course brings together knowledge exchange and reflexive learning, inviting users to apply critical intentionality in their work while developing practical competence in the use of creative methods (Leventon et al., 2021). The article uses the course as an analytical lens to assess the pedagogical, political and systemic implications of creative methods for biodiversity decision-making, with sustained attention to the conditions that enable grounded and reflexive practice.

The analysis focuses on three methods featured in the online course: the Who Am I? game, participatory theatre and debriefing. These have been selected for their contrasting formats, their capacity to prompt emotional and cognitive engagement and their potential to support deeper shifts in understanding, values and systemic goals. The discussion is guided by the following research question: How can creative methods be effectively adapted and communicated through online learning to support inclusive biodiversity decision-making?

Following this introduction, the next section further outlines the PLANET4B project research context and Meadows's (1999) leverage points framework, a heuristic for understanding how creative methods might intervene within complex decision-making systems. This conceptual discussion is accompanied by an exploration of the political, pedagogical and methodological potential of creative research methods, in the context of biodiversity decision-making. The next section presents the methodology used to design the course and identify appropriate methods, including consultation, criteria development and validation. The above three focal methods are

then examined in detail. Each is analysed in relation to its context of use, potential contribution to inclusive practice and relevance for biodiversity governance. The article concludes by assessing the implications of the project's approach for wider efforts to mainstream inclusive, participatory approaches in biodiversity governance, practice and research.

Leveraging creativity: creative methods as transformative interventions

The PLANET4B project has explored how creative and engaging methods can be used to contribute to better biodiversity decision-making, including by shaping social, cultural and institutional perceptions and actions (Franklin et al., 2025). Project partners trialled a range of methods, including participatory theatre, decision-making role-playing games, artistic workshops, community mapping and storytelling (Franklin et al., 2025). As an integral part of this work — reflecting the intersectional approach underpinning PLANET4B's theory of change — partners examined how factors such as gender, religion, ethnicity, race, age, culture and disability, shape perceptions of biodiversity and influence decision-making. Equally central to PLANET4B's theory of change is the idea that technical scientific knowledge can inform understanding and the development of workable solutions to the biodiversity crisis; however, it is insufficient on its own. Such a view contradicts the perennial trend of technical knowledge remaining isolated from decision-making, policy and societal engagement, stymying transformative potential. This is a critical point. Achieving substantial biodiversity outcomes requires addressing both direct and indirect drivers of biodiversity loss that in turn necessitates engaging with both social and ecological dimensions of change. Such an engagement depends on knowledge being embedded within decision-making structures and translated into relatable action that aligns with local preferences (Tedesco et al., 2023; Löfqvist et al., 2023). Under these conditions, efforts to address biodiversity loss can strengthen both social and environmental outcomes (Abson et al., 2017; Botkin et al., 1979; Meadows, 1999; Soliev et al., 2025).

Informed by Meadows's concept of leverage points, which identifies places to intervene in a system ranging from shallow parameters to deep paradigms, the PLANET4B project explored possibilities for understanding shifts in worldviews, expanding governance processes and transforming systemic relationships (Meadows, 1999; Angheloiu & Tennant, 2020; Mendes & Inoue et al., 2024). While Meadows's framework offers a valuable map of systemic depth, it is limited by its abstract and hierarchical formulation, which can obscure the situated nature of power

relations, political dynamics and the necessity of context-specific strategies (Horcea-Milcu, 2022; Soliev et al., 2025). To address these limitations, PLANET4B adapted the original framework such that intersectionality and power relations were incorporated (Mendes & Inoue, 2024). Across the place-based and sectoral case studies, project teams developed their intersectional focus through a combination of critical consortium workshops on positionality and supporting literature reviews that grounded each study in its socio-political setting (Aspøy et al., 2023). Intersectionality thus served not only as a conceptual tool to analyse how inequalities structure biodiversity governance but also as a prompt for reflexive research practice (Barton et al., 2024). In practice, this meant that creative and participatory methods were not treated as neutral instruments but as situated interventions capable of revealing and contesting existing configurations of power (Soliev et al., 2025).

Creative approaches can enable emotional engagement, broaden participation in decision-making and support shifts in the mindsets and paradigms that shape biodiversity decisions (Soliev et al., 2025). Through prompting imaginative thought and critical reflection, such methods can open space for informed dialogue on difficult topics, including ecological grief and structural disempowerment, while cultivating collective agency (Abson et al., 2017; Leventon et al., 2021). Their consequent growing uptake and application within an increasingly diverse range of settings heightens the need, however, for care-full design and facilitation; poorly implemented approaches can perpetuate and intensify challenges associated with more traditional one-size-fits-all methods (Cornwall, 2008; Leitheiser et al., 2022). Key questions concerning whose knowledge is legitimised, how decisions are made and who ultimately benefits, are still all too often left unaddressed (Abson et al., 2017; Escobar, 2017).

The pitfalls of implementing creative methods can be mitigated through critical awareness and care-full design (Franklin, 2022). For example, epistemic extractivism, in which participants' insights are appropriated without recognition, reciprocity or meaningful benefit-sharing, becomes particularly problematic when methods invite vulnerability and deep internal reflection (Smith, 2012; Bradbury, 2015). Where facilitators are not attuned to these dynamics, or lack the skills to navigate them ethically, participatory processes can reproduce harm and undermine meaningful engagement (Leventon et al., 2021). Similarly, methods that disregard local cultural, political or ecological realities are unlikely to meet the needs of the communities they intend to serve. Such failings are often further exacerbated by policy-institutional pressures to produce rapid outcomes, leaving little space for the slow, relational work needed to build trust and contextually adapt (Leitheiser et al., 2022). In this vein, when participants invest time and trust, but the creative process is not supported by

meaningful follow-up, institutional responsiveness, or honest communication about its limitations, there is a significant risk of failing to met expectations and generating disillusionment (Ghafran & Yasmin, 2025). As such, close attention to the intention, implementation and impact of any method remains essential to avoid reproducing extractivist or hierarchical epistemologies and to support more equitable knowledge relations (Holliman et al., 2024).

Methodology

The methodology presented in this article is grounded in the design and development of an open-access online training course created within the PLANET4B project, hosted on care-full-courses[1]. The course was shaped by iterative reflection, internal consultation and the practical insights generated through the case-based experimentation with creative methods across 11 PLANET4B case study contexts. The course was further shaped by insights from the broader project, including specific learnings about the delivery of creative and behavioural methods, as well as the experiences of the partners involved in adapting and applying each method featured in the course. The course aims to equip researchers, policymakers, business-sustainability champions and civil society actors with practical and critical capacities to apply creative methods, in ways that are both contextually relevant and ethically informed (Lyons et al., 2025).

To begin, key goals of the course were identified, including to foster reflexivity, broaden access to creative methods and support learners to navigate the complexities of power, emotion and positionality in biodiversity decision-making. These goals were shaped by earlier project phases, including participatory experimentation with over 30 creative methods and extensive internal reflection on what worked, what proved challenging and what enabled transformation.

To ensure relevance and accessibility, the selection of methods featured in the course was guided by a combination of internal consultation and external scoping. A survey and informal interviews with policy professionals and NGO practitioners in the UK and Europe helped identify what kinds of methods were perceived as useful, accessible and adaptable within institutional constraints. Twelve methods were selected from the survey for detailed ("spotlight") inclusion in the training, reflecting a diversity of formats (e.g. serious games, drawing workshops and role-playing workshops), degrees of facilitation skill required, and potential to act at different leverage points within decision-making systems (Lyons et al., 2025).

1 https://www.care-full-courses.com/

The training was designed to support a learning process that embraces experimentation and critical questioning. Learners are invited to reflect on their positionality, anticipate ethical challenges and adapt the methods to their own settings. The course structure thereby embodies the ethos of PLANET4B by treating learning as a political and relational process rather than a technical fix. Each featured method was then developed into a dedicated training module, combining written guides, video interviews with facilitators, real-world examples and prompts for critical reflection. These materials were initially adapted from a previous project deliverable (Franklin et al., 2025), then reworked as pedagogical resources through additional refinement and user feedback. Additional modules offer guidance on inclusive facilitation, delivering and demonstrating meaningful impact, and building and working with learning communities. These elements together support not only technical skill but also reflexive engagement with biodiversity decision-making (Lyons et al., 2025).

The following section presents three of 12 spotlight methods featured in the course in detail: *Who Am I?*, Participatory Theatre and Debriefing. Discussed in terms of how they contribute to transformative learning in biodiversity decision-making, they have been purposefully selected to represent key pedagogical dimensions of transformative learning: accessibility, emotional engagement and reflexivity. Each method illustrates a distinctive facet of what creative approaches can contribute to biodiversity decision-making, offering practical insight into how accessibility, emotional engagement and reflexivity can be fostered in transformative learning contexts. The discussion addresses how each method can be used to challenge dominant narratives, legitimise diverse forms of knowledge and foster relational accountability. In doing so, it bridges methodological innovation with practical application across varied policy, business, academic and civil society contexts.

Discussion

Accessible — Who Am I? method:

The Who Am I? method exemplifies how an ostensibly simple creative activity can begin a process of thinking and talking about human-nature relationships as related to lived experiences. Furthermore, as an accessible method, it offers a fertile training ground for working with participants both individually and collectively, enabling facilitators of all experience levels to engage meaningfully with situated dynamics.

In the PLANET4B project, the Who Am I? method was implemented during the first meeting of the "learning community" for the UK place-based case study. Case study learning communities consisted, on average, of 5–8 case representatives, with these individuals working collaboratively with local consortium leads across a 12–18 month research period. The UK case study focused on improving access to nature and the outdoors for Black, Asian and ethnic minority groups, with Coventry University and Dadima's Community Interest Company (CIC) serving as the lead local partners. Dadima's CIC "aims to encourage people of all cultural backgrounds and ages to feel welcome in the countryside" by providing a supportive atmosphere to connect with nature in diverse ways and regularly organising walks in the Chiltern Hills in the south of England (Chilterns National Landscape, 2024).

During the game, learning community participants were each given a card depicting a plant or animal, many of which were native to the Chiltern Hills. Without seeing the card themselves, they placed it on their heads and asked Yes or No questions to guess their identity. The group then engaged in a discussion exploring their feelings towards the species they had embodied (Binder et al., 2025). The game and facilitated discussion created space for reflections on personal resonances and prompted the sharing of stories or associations linked to each species. Participants discussed how cultural meanings could vary, such as the owl being viewed as a symbol of wisdom in some contexts or as an omen of misfortune in others.

By enabling participants to articulate instinctive and situated forms of knowledge, Who Am I? repositions experiential knowledge as central rather than peripheral and surfaces emotional and cultural ways of relating to the more-than-human world that are often overlooked in conventional environmental discourse (Turnhout et al., 2020; Binder et al., 2025). Framed through Meadows's (1999) leverage points, the ensuing reflexive discussion can be seen to unsettle dominant models by demonstrating that biodiversity is not the exclusive domain of scientific institutions, Eurocentric ideas or formal policy. In so doing, the method — supported by care-full facilitation — can address the symptom of disengagement by easing participants into biodiversity conversations and legitimising diverse forms of knowing, laying the groundwork to shift how biodiversity is valued and who is recognised as capable of contributing to its decision-making (Abson et al., 2017; Fischer & Riechers, 2019; Soliev et al., 2025). In the context of the UK learning community, the method helped foreground a deeper cause for disengagement rooted in epistemic hierarchy and exclusion, where racialised and minoritised groups are positioned as participants to be consulted not as recognised holders of insight about human-nature relations (Bhambra, 2014; Collins, 2000; Holliman et al., 2014).

In addition to the framing of nature, the playful and low-pressure format of the Who Am I? method offers a permissive atmosphere in which reflection and storytelling can emerge. Because it does not depend on expert facilitation, the method minimises facilitator hierarchy and supports the development of trust and rapport among participants. The method requires very little in terms of time, materials or emotional risk. As the online training course councils, however, the simplicity of the method does not eliminate the need for intentional design and ethical attentiveness, particularly regarding power dynamics, the care with which discussion topics are introduced and the responsibilities of facilitators. As a practical example, the open-access course materials encourage facilitators to take part in the method alongside participants, subtly challenging conventional knowledge hierarchies by modelling shared learning and vulnerability.

Creative — participatory theatre

Participatory theatre is a creative arts-based method that invites participants to engage with the complexity, agency and emotional dimensions of future imaginaries. Within the context of PLANET4B it was used to help participants understand the intergenerational consequences of biodiversity loss.

Participatory theatre can be enacted through a suite of specific techniques that invite participants to interact with, intervene in and shape a play. The method offers both pedagogical and political potential by creating a fictional yet supportive space for participants to explore the emotional and ethical dimensions of biodiversity loss. The method enables the expression of genuine feelings while also incorporating humour and play, allowing dilemmas to be approached with care and creativity. Furthermore, by placing decision-making within the flow of a narrative, the method helps connect ecological, economic and social questions in a way that is both engaging and reflexive and surfaces tensions, values and power relations embedded in real-world dilemmas (Kelemen & Czett, 2025).

The PLANET4B participatory theatre workshop was co-developed by the Káva Theatre Group and World Wide Fund for Nature (WWF) Hungary. It was subsequently evaluated by the Environmental Social Science Research Group (ESSRG) (Kelemen & Czett, 2025; Káva Kulturális Műhely, n.d.). The method was used with several groups of secondary students (aged 14 to 18) in Hungary, as part of a sectoral case study focused on raising environmental awareness in education. The co-created play, *Blindspot*, unfolds in a fictional village where a healing plant is discovered, only to become endangered due to a biotech company's plan to build a factory in the village. This scenario frames a conflict between short-term economic

benefit and long-term ecological degradation (Kelemen & Czett, 2025). As the story progresses, participants are invited to step into the roles of company employees. Their interventions shape the unfolding narrative and bring to the fore multiple, and at times contradictory, perspectives. Participants are encouraged to embody characters they may not identify with, challenge assumptions and propose different actions or endings (Kelemen & Czett, 2025).

The pedagogical approach embedded in *Blindspot* reflects a commitment to care, reflexivity and systemic awareness. Moments of discomfort or contradiction are embraced as generative sites of learning. For instance, a key intervention occurred when three female students disrupted the dominant economic narrative embedded in the storyline, prompting a wider group discussion on values, structural constraints and ecological responsibility (Kelemen & Czett, 2025). Through these dynamics, *Blindspot* can be seen as operating across multiple leverage points in Meadows's (1999) framework. It challenges dominant narratives (mental models) by foregrounding diverse values and forms of knowledge and contributes to a reframing of the system's goals by questioning what counts as legitimate knowledge and as desirable futures and surfacing tacit assumptions (Abson et al., 2017; Fischer & Riechers, 2019). The method has potential to transform a symptom — such as a limited personal imagination of transformative change — into an opportunity to question root causes: the dominant narratives and structural constraints that usually remain unspoken.

Participatory theatre is resource intensive, requiring time, materials, funds, skilled development, complex logistics, facilitation expertise and emotional support. The online training on participatory theatre addresses the method's potential to evoke strong emotional responses, including anxiety, grief and frustration, particularly when exploring themes such as ecological degradation and intergenerational injustice. Facilitators are encouraged to support emotional processing by offering achievable actions participants can take in response to the issues raised and by establishing group agreements that prioritise listening, mutual respect and responsiveness. The *Blindspot* play is not presented as a blueprint but offers an example of how participatory theatre can be utilised to open space for critical discussion. The training guides facilitators through preparatory exercises, such as warm-ups, improvised role-play and debriefing, while intentionally leaving the narrative content and key moments of interaction open to contextual adaptation. Facilitators are encouraged to shape the story in ways that speak directly to their community's concerns and interests. Guidance is also offered on partnering with theatre groups, co-developing scenarios and adapting the method to different cultural, linguistic and logistical contexts.

Reflexive — debriefing

Debriefing is included in the online training as a distinct practice, with guidance reflecting the specific learnings participants are prompted to carry forward. While not a standalone creative method, it functions as a valuable complement to multiple other methods. Its framing as a separate practice highlights that reflexivity is integral to creative and participatory work, while offering a practical roadmap for the debriefing process, which itself draws on creative tools. In the PLANET4B project, debriefing sessions were convened within the majority of the case studies and, in the case of the participatory learning communities, at key stages throughout the research process (Franklin et al., 2025). These sessions supported participants in reflecting on and evaluating their experiences and often incorporated a range of creative and arts-based techniques to facilitate the process.

Debriefing is not a simple recap of a previous activity, but a deliberate and reflective process designed to extend the moment of engagement and transform the lived experience into actionable knowledge (Kolb, 2014; Crookall, 2011). It provides a structured space where participants can process complex emotions, recognise their own knowledge and consider possible next steps. Moreover, debriefing serves a caring purpose, providing space to articulate, legitimise and situate emotions related to biodiversity loss, such as grief, anger, anxiety and helplessness, which may arise as a result of an intervention. Creative methods can prompt strong emotional responses, as they invite vulnerability and often foster deep, personal engagement (Czett & Kelemen, 2025). This emotional intensity necessitates ethical facilitation practices — including for example, using techniques such as mood cards to help participants articulate thoughts and feelings without pressure to disclose more than they wish.

Debriefing may also open a pathway towards developing strategies for change-orientated action. It is structured to support the emergence of new questions, relationships and ethical orientations. It is here that Meadows's (1999) leverage points relating to mental models and system goals again become salient. Through debriefing, participants might be able to interrogate dominant narratives, imagine alternative systems of value and reflect on their own role in those systems. Debriefing has the potential to engage directly with what Turnhout et al. (2020) describe as the politics of co-production, resisting the instrumentalisation of participants' knowledge or emotional labour. In this way it offers a tool to counter underlying causes of limited post-intervention integration, including, for example, institutional timetables that compress reflection and project logics that reward delivery over sustained sense making. Debriefing addresses symptoms of this limited integration, including

extractive participation, fragmented insight, unresolved emotion or intentions for action that dissipate once a prior creative intervention ends. Thus, while a debriefing session does require an additional time commitment, it provides a means to resist extractive dynamics and to affirm the value of the knowledge or emotions participants might have contributed (Czett & Kelemen, 2025).

In the PLANET4B online training, debriefing is introduced as a method that cultivates reflexivity by creating space for participants to critically engage with their own responses, assumptions and positions. The training frames it as a vital moment for slowing down, inviting participants to make sense of what they have experienced and how it relates to broader systems of meaning. Facilitators are guided to support this process by holding space for ambiguity, contradiction and complexity, allowing for an open-ended, exploratory dialogue that may unsettle as much as it clarifies. Debriefing is thus positioned as a generative practice of reflexive learning, aligned with transformative approaches to biodiversity decision-making.

Conclusion

The creative methods explored in this article — the *Who Am I?* method, participatory theatre and debriefing — demonstrate the potential to foster new forms of learning and engagement in biodiversity decision-making. Rather than positioning these methods as supplements to policy, the PLANET4B project advances them as interventions capable of understanding and enabling shifts in dominant narratives, surfacing emotional and ethical dimensions of environmental change and challenging rigid and exclusionary decision-making processes. In this sense, they speak to deeper leverage points within systems: mental models, relational dynamics and the goals underpinning how societies govern human-nature relationships (Meadows, 1999; Abson et al., 2017). The analysis shows how creative interventions can address symptoms that limit biodiversity decision-making — such as disengagement, constrained imagination and procedural practices that reinforce exclusion. At the same time, they also engage with underlying causes — including epistemic hierarchy, dominant narratives and institutional rhythms that compress reflection and limit accountability.

The transformative potential of the methods discussed in this article is not guaranteed, as creative practices are not inherently magical or immune to the risks of instrumentalisation, co-option or extractivism. Used uncritically, they can replicate the very hierarchies they seek to dismantle (Abson et al., 2017; Franklin, 2022). A critical and caring approach is therefore essential to navigate the complexities

of power, participation and transformation (Soliev et al., 2025). The online training resource developed through PLANET4B seeks to embed such an idea in practice. It is designed not as a prescriptive toolkit but as a participatory learning environment that encourages experimentation, contextual adaptation and critical reflection. By including case studies, guiding questions and facilitation strategies, the training supports users in applying creative methods thoughtfully across diverse decision-making settings. It also stresses the importance of slow, relational work, of building trust, learning from discomfort and holding space for emergent insights.

Ultimately, embedding creative, reflexive and participatory approaches into biodiversity decision-making requires more than methodological novelty. It demands a reorientation towards inclusion, care and imagination, as core principles of the transformations needed for addressing the alarming rates of biodiversity loss and the broader social-environmental challenges of our time. This aligns with the No Limits to Hope vision, which calls for expanding our collective capacity to learn, act and relate differently.

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Cultivating seeds of the future: the role of spirituality for nurturing meaning, hope, agency and engagement for sustainability

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Abstract

Amid a growing number of interconnected societal crises, many people are experiencing mental distress and an associated sense of powerlessness. Scholars increasingly suggest that our greatest challenge is not climate change, biodiversity loss, geopolitical tensions or polarisation — but the widespread illusion of our own insignificance. Feelings of meaninglessness, hopelessness and apathy are among the underlying causes, fuelling a vicious cycle of deteriorating individual, collective and planetary wellbeing. At the same time, spirituality and religion are gaining attention for their potential to foster meaning, hope and engagement in the face of existential crises. However, their potential role in supporting deeper societal transformation remains under-explored. Our study addresses this gap by investigating the innovative online course "Zen and the Art of Saving the Planet" (ZASP), which has attracted over 6,500 participants globally in the past two years. Based on document analyses, surveys and "spaces for listening and dialogue," our findings highlight the course's contribution to the emerging field of inner transformation and associated education, which aims to accelerate change by integrating inner and outer dimensions of sustainability. We show how spirituality can mediate the entangled creation of meaning, hope, agency and engagement across

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individual, collective and system levels. Together, our findings advance knowledge on the complex intersection between inner development, culture and system change; the role of faith-based groups; and the integration of diverse knowledge systems for transformative education — offering a precedent that other training institutions could follow or learn from.

Keywords: Polycrisis, transformative learning, human potential, mindsets, paradigm shift, culture change

Introduction

In the face of escalating global crises — ranging from climate change and biodiversity loss to geopolitical tensions and social polarisation — many individuals experience a deep sense of helplessness (Hickmann et al., 2021). Increasingly, scholars argue that the most pressing challenge may not lie in these external threats themselves but in the pervasive illusion of our own insignificance (O'Brien, 2021). This existential disconnection gives rise to feelings of meaninglessness, hopelessness and apathy, which in turn fuel a vicious cycle of deteriorating individual, collective and planetary wellbeing (Wamsler & Bristow, 2023).

While traditionally seen as private or peripheral, spirituality and religion may hold transformative potential for navigating the complex emotional and ethical terrain of today's polycrisis (Koehrsen & Ives, 2025; Ives et al., 2024; Woiwode, 2016). Yet, their role in fostering deeper societal transformation — beyond personal wellbeing — remains under-explored (ibid).

This article addresses that gap by exploring how spiritual approaches can serve as a catalyst for inner and outer transformation and mediate the entangled creation of meaning, hope, agency and engagement in the context of sustainability. To this end, we investigate the potential role of educational interventions by faith-based groups in nurturing these capacities across individual, collective and systemic levels. Particular attention is paid to the potential of transformative education to foster shifts in relationality, along with accompanying narrative and paradigm changes, and how these may translate into concrete action.

Methodology

Overall research approach

Our study is a qualitative case study and comparative evaluation of Zen and the Art of Saving the Planet (ZASP), a 7-week online course offered by Plum Village, a global community of mindfulness practice centres founded by Zen master and activist Thích Nhất Hạnh. Based on Hạnh's book of the same name, the course is delivered in collaboration with Christiana Figueres, former executive secretary of the United Nations Framework Convention on Climate Change and key architect of the 2015 Paris Agreement. Since its launch in 2023, ZASP has engaged more than 7,500 participants worldwide, and its reach continues to grow. Our study focuses on the most recent cohort — the "Breathe" cohort — who completed the course in December 2024. We selected ZASP for its strong alignment with our research aims, as it is designed to help participants balance personal wellbeing with climate action, develop resilience and navigate difficult emotions, join a purpose-driven community of changemakers, practice deep listening and compassionate communication, cultivate a deep relationship with the Earth and transform climate anxiety into hope and meaningful action.

Methods for data collection and analysis

We collected primary and secondary data from the online course platform and through so-called "spaces for listening and dialogue" with 74 information-rich participants. These spaces involved group discussions and pre- and post-space surveys that explored how participants' views of the world and their role within it had changed (meaning); how their sense of hope and agency had been affected; how these shifts played out in their personal, social and professional lives; and whether any ripple effects supported or hindered sustainability and transformation at the collective, organisational or systemic levels. We also examined through the surveys what contributed to these changes and which elements of the course were experienced as particularly transformative.

We used thematic analysis to explore the gathered data in relation to our research aims (Nowell et al., 2017). The analysis involved the following steps: 1) familiarising ourselves with the data, 2) generating initial codes and ideas through open coding, 3) interpreting and systematically organising the content into themes and associated patterns, 4) reviewing these themes, and 5) refining them further through axial and selective coding. Data were coded and analysed until saturation was reached — that is, when no new significant or relevant themes or patterns could be identified and previously discarded coding categories were confirmed as irrelevant.

Our findings were then compared with other quantitative and qualitative studies from the courses' broader surveys (n1 = 868; n2 = 1,526) (Mundaca & Wamsler, 2025; Wamsler, 2026). These surveys featured quantitative scales measuring changes in anxiety, resilience, hope and agency and qualitative questions inviting participants to share meaningful "Aha! Moments" — sudden insights or realisations experienced during the course — and to reflect on the most significant changes in their awareness and transformation of their "cows" — habitual patterns of thinking and being that may limit or obstruct transformative action.

In addition, we situated the findings within key theories of inner transformation and related educational frameworks. The IMAGINE framework is particularly relevant in this context. It outlines six core characteristics of integrated inner-outer transformation, including its ontological and epistemological foundations and their implications for practice (Ives et al., 2023a). Building on this, the "education tree" framework (Wamsler et al., 2024) delineates four essential components for guiding related teaching: how we perceive the world, how we come to know, how we engage and how we ensure high-quality education that fosters deep understanding, agency, hope and transformative action. Drawing on these frameworks, we assessed how ZASP aligns with emerging research and approaches in the field and compared it with other courses increasingly offered by academic and professional institutions to support integrative inner–outer transformation.

Results

In this section, we present the thematic analysis of participant reflections from the ZASP course. Analysis is organised into seven thematic categories: meaning-making, hope, agency, engagement, ripple effects, spiritual underpinnings and theoretical considerations. Each section begins with a summary of key themes in bullet point form, followed by explanations and illustrative quotes.

Changes in meaning-making

Key patterns identified include:

- Reframing identity and meaning through interbeing and interconnectedness.
- Shifting from individualism to community and belonging.
- Embracing perspectives on time and suffering as integral to meaning-making.
- Emergence of humility and not-knowing as a foundation for meaning-making.
- Integration of contradiction, uncertainty and complexity.

A recurring pattern across responses was a shift in participants' meaning-making system and worldview towards an expanded sense of interconnectedness and ecological belonging. As one participant expressed, "I now understand that I am not separate from the world, but a part of it, and that my well-being is linked to the well-being of the Earth."

The insight of interbeing helped many feel less isolated and more rooted in something larger than themselves. It was more than an idea — it was a felt experience that shaped how people viewed life and their place in it. It fostered a shift from feeling alone or overly responsible to finding strength in community.

The described reorientation from fear-driven narratives to more relational ways of seeing life often brought a deepened sensitivity to both suffering and awe — not only personal but also planetary and collective: "I see more clearly the pain around me, the destruction, but also the beauty and resilience." In this context, many participants described the recognition of suffering as a gateway to transformation.

Several also experienced a transformation in their understanding of time, framing ecological collapse within a broader cosmic continuity that brought perspective and peace. It supported the move away from individualistic interpretations of life and towards a more relational and systemic worldview, along with associated meaning-making processes.

Alongside increased clarity, some respondents described a sense of continuous ambivalence and overwhelm. One noted: "The course opened up more questions than answers for me," reflecting a non-linear process in which moments of insight coexisted with uncertainty.

A related, striking theme was the development of humility and not-knowing as a new foundation for meaning-making: "I learned that not having the answers is okay. I can rest more in presence and respond from there."

There was also a greater comfort with paradox and uncertainty. Participants moved away from needing to prove their worth or control outcomes. Instead, meaning was found in presence, kindness and the way they show up in the world. This allowed for a sense of purpose that felt more grounded.

Changes in hope

Key patterns identified include:

- Shift from abstract to embodied hope.
- Hope as a new form of resilience amidst despair.
- Deepened hope through community and connection.
- Seeing hope as decoupled from outcomes but tied to meaningful action.
- Hope as an ongoing, evolving process, marked by contradiction, renewal and re-evaluation.

Many participants described a transformation in their understanding of hope — from being a passive or outcome-dependent emotion to a grounded, daily practice. One participant noted, "The course has helped me to experience hope not as a distant or abstract expectation for the future but as something alive in the present moment."

Despite acknowledging ecological and political deterioration, several participants reported an increase in hope. One stated, "I feel more hope now, even when the world and the climate situation seems to have gotten worse." This resilience is often linked to changes in meaning-making and community support. Hope was frequently described as emerging from interpersonal connection and being part of a global community: "Being part of a sharing group with people who had similar aspirations gave me a sense of hope."

Importantly, hope and despair were not experienced as mutually exclusive anymore. Participants reported that acknowledging despair allowed for a deeper, more sustainable form of hope to emerge. As one stated, "The course gave me tools to balance grief and joy, and helped me stop shutting down."

Others emphasised that hope has become less about certainty and more about direction: "Hope is finding a meaningful direction forward, regardless of outcome." Hope was redefined as something nurtured by being present and connected with others. It wasn't about fixing everything but about staying grounded and not giving up. Seeing others committed to similar values made participants feel less alone.

However, hope was not static or consistently held. Some participants described periods of renewed hope that were subsequently tested by ongoing grief or systemic realities. Others reported moments of reduced hope that nevertheless gave rise to more grounded, values-driven forms of engagement. Letting go of unrealistic or overwhelming expectations enabled a clearer focus on presence and right action. "I'm no longer trying to save the world," one participant shared, "but I'm showing up

anyway — with more heart."

The described reflections correspond to a shift from Western heroic change-making archetypes towards greater relationality and decentring the self. They also suggest that hope is not a singular state but a dynamic process, often marked by contradiction, renewal and re-evaluation. The course appears to have provided a container within which these emotional complexities could be held and explored.

Changes in sense of agency

Key patterns identified include:

- Increased agency through embodied interbeing and integrity.
- Emerging agency through self-care and community.
- Increased agency by holding tensions and limitations.

The concept of interbeing enhanced participants' sense of agency (cf. "Interconnection of inner-outer processes," below). Additionally, many described developing a new definition of agency — instead of the ability to control outcomes, it came to be understood as the capacity to respond with clarity and compassion, align their actions with their values and make more deliberate choices (cf. "Validity, credibility and broader significance of outcomes," below). One participant wrote, "I now see [agency] less as the capacity to control or fix things and more as the ability to respond, to be present, to care." This reframing also means choosing not to act when necessary. This kind of discernment — knowing when to pause — was described as just as important for agency.

Furthermore, the collective dimension of one's sense of agency was highlighted as fundamental. As one participant shared, "This course provided a powerful blueprint for cultivating collective agency, empowering us to build and sustain local communities of activism."

Yet, some participants expressed having contradictory feelings or feeling constrained. One participant said, for instance, "I feel more empowered, but I'm still unsure how to bring this into my activism," reflecting an ongoing negotiation between agency and impactful practical actions (cf. "Concluding remarks").

These reflections highlight the contextual and fluctuating nature of agency, shaped by both internal and external factors. At the same time, they indicate a move towards *response-ability* — a concept that describes how ethics and agency shift when grounded in relationality rather than individualism (cf. Walsh & Ng, 2019).

Changes in engagement

Key patterns identified include:

- Improved relationships.
- Simpler and more ethical lifestyles.
- Shift from outcome-driven to value-driven engagement.
- Greater capacity for creative, compassionate conflict resolution and activism.
- Ongoing gaps between understanding and action.

Participants reported a wide range of behavioural changes that led to improved relationships, both personal and professional. Participants enhanced their abilities to practice deep listening and compassion, communicate more effectively and stay connected to what matters. As they expressed, "Just being present can change the quality of a moment"; "I have become more patient and less judgemental"; "Now, I pause before speaking, checking whether my mind and heart are aligned."

Many participants also described concrete shifts in lifestyle habits, such as simplifying life, consuming less, adopting plant-based diets, reducing air travel or composting. One person shared, "I have way too much stuff... so I stopped buying things made of plastic," demonstrating a shift from insight to tangible behavioural change. Others engaged increasingly in forms of local activism that reflected their values in creative, connected ways, including organising clothes swaps, beach cleanups, environmental campaigning, community gatherings or peaceful protests. Many indicated in this context a shift from outcome-driven to value-driven engagement.

Several participants also integrated sustainability more deeply into their professional work — such as launching eco-conscious projects or incorporating environmental themes into teaching and writing. Many noted a transition from anger-driven engagement to more sustainable and joyful activism and integration.

Despite these efforts, some participants continued to doubt their potential: "I feel limited — by my own capacity — to do more." While many reported experiencing increased agency, connection, purpose, as well as small-scale changes, fewer undertook concrete steps towards collective or institutional transformation at mainstream, macro or policy-level contexts. Some acknowledged gaps between understanding and action or a sense of being "stuck" in intellectual insight without embodied integration. These reflections highlight the non-linear and evolving nature of people's sense of agency and behavioural transformation.

Ripple effects on cultures and systems

Key patterns identified include:

- Formation and expansion of new collaborations and communities of practice.
- Integration of mindfulness into leadership and management approaches.
- Increased willingness to challenge institutional norms and initiate change at organisational levels.
- Recognition that mainstream systems hamper ripple effects.

Participants often framed ripple effects as natural extensions of personal transformation, in which inner shifts in awareness, emotional regulation and values translated into enhanced interpersonal dynamics and collaboration. Many noted that their internal changes positively influenced those around them.

Many reported finding new courage to speak up, leading to wide-ranging ripple effects within their work contexts. Participants articulated systemic visions of cultural and structural change and described initiating dialogues on sustainability, ethical decision-making and community wellbeing within their workplaces — catalysing subtle shifts in work culture. Several participants also reported initiating communities of practice, reading groups or activist networks that fostered shared practices, mutual support and outreach.

But participants also acknowledged limits to their impact. A few questioned whether they had the professional knowledge and tools to support larger-scale transformation and whether their social and organisational environments were open to deeper change — highlighting the tension between personal commitment and systemic constraints.

Spiritual concepts supporting transformation

Key patterns identified include:

- Spirituality as an anchor for transformation.
- Spiritual concepts as a lens for new understanding.
- Occasional tensions with secular or psychological framings.

Spiritual teachings were deeply woven into participants' reflections and the reinterpretation of contexts and challenges. They served as anchors for new ways of being, thinking and acting. The principle of interbeing was frequently cited as foundational. One participant explained, "Understanding interbeing helped me

to stop blaming and start feeling more connected." Teachings of impermanence and non-attachment were also often cited as transformative[1]. One participant shared, "The notion of impermanence helps me to understand that the future is not predetermined; what I think and do in this moment does have an impact."

Another frequently mentioned framework was that of the Warrior, the Artist and the Meditator[2]. Participants shared that integrating these archetypes into their lives enabled them to become more effective activists: "I somehow understood those things, but I didn't have words for it. I didn't have a concept." Related reflections underscore the transformative power of naming — how articulating previously unspoken experiences can catalyse change. They also point to a broader cultural dynamic: the erosion of certain inner resources or ways of being that, once unnamed or devalued, become harder to access and integrate.

The teachings and associated mindfulness practices (mindful breathing, walking and listening) were described as concrete, hands-on tools to enhance resilience, strength and clarity rooted in a new-found sense of identity, meaning, hope and agency. Participants described how their practices evolved from an individual focus to more relational and systemic ways of being, indicating an ontological shift in how they perceive and relate to the world. As one put it: "Mindfulness is no longer just about stress reduction. It's about how I meet the moment, others, and the planet."

However, some participants expressed difficulty in understanding certain concepts and in articulating them beyond spiritual circles[3]. This suggests that spiritual teachings may not resonate equally with all individuals or across all contexts, highlighting the challenges of translating such insights into broader cultural or secular frameworks.

ZASP's unique features and theoretical alignments supporting transformation

Key patterns identified include:

- Holistic inner-outer integration rooted in spiritual principles and community.
- Transformation as embodied, lifelong practice and shared engagement.
- Strong alignment with emerging sustainability science.
- Limited guidance for cross-sector, scaled transformation.

ZASP stands out insofar as it is grounded in a spiritual tradition or psychology

1 See https://plumvillage.org/library/dharma-talks/the-five-remembrances

2 See https://plumvillage.org/podcast/the-meditator-the-artist-and-the-warrior

3 See https://plumvillage.org/library/dharma-talks/free-from-notions-the-diamond-sutra

and for cultivating a global community (*sangha*; Sanskrit for [spiritual] community). Participants reported a deeper sense of interconnection and community compared to other programs they had previously taken.

A distinctive feature consistently highlighted was ZASP's emphasis on interbeing — linking personal mindfulness with planetary and systemic awareness through concrete, everyday practices. Importantly, transformation is here framed not as a singular event or process but as an ongoing, embodied way of living. This holistic integration sets it apart from some more anthropocentric or cognitively-oriented programs. The course conceptualises activism as emerging from sustained inner practice and insight, offering frameworks, language and an environment to articulate and continuously deepen related experiences.

The ZASP course aligns closely with emerging scientific findings. It reflects the six key characteristics or dimensions of inner transformation for sustainability outlined in the IMAGINE framework (cf. the methodology section), which include:

- Interdependence: The interconnectedness of inner/outer and individual/collective phenomena.
- Multiple Potential: Latent capacities within each person to contribute to change.
- Activation: Activation of inner dimensions across individual, collective and system levels.
- Generation: The intentional cultivation of transformative capacities.
- Inclusion: The inclusion of diverse perspectives and traditions.
- Expansion: Expanding knowledge systems to include inner and subjective ways of knowing.

Rooted in the teaching of interbeing, the ZASP course emphasises the interconnectedness of personal, social and ecological realms. ZASP also highlights multiple potentials, encouraging participants to recognise their latent capacities for change, such as through renewed mindfulness, concentration, insight and compassion. The spiritual concepts offered affirm that everyone possesses unique capacities to contribute to advancing sustainability.

Through intentional, repeated practices — including breathing, silence, deep listening, mindful speech, joint reflection and community building — ZASP supports transformation, reflecting the IMAGINE framework's focus on activating transformative capacities across personal, collective and systemic levels. Participants

learn to engage constructively with emotions like anger and anxiety. In addition, group activities, such as *sangha* circles, foster collective compassion, while teachings on systemic issues keep the focus on broader societal change.

ZASP also emphasises inclusion by integrating diverse worldviews and knowledge systems. It invites participants to connect ZASP practices with their own identities, beliefs and professional work. Finally, it expands knowledge systems by emphasising embodied, contemplative forms of knowing, aligning with the IMAGINE framework's broader epistemological approach.

The ZASP course also aligns to a great extent with the four essentials of the education tree framework (cf. the methodology section 2). These include providing:

- A comprehensive understanding of the nature of today's sustainability crises in a complex, constantly changing world, and one's role in it;
- A safe space and integrative methods for exploring related inner dimensions and transformative capacities on a continuous basis;
- Practical guidance on how to design and implement measures that link individual, culture and systems change (and address associated power structures) while, at the same time
- Ensuring quality education through the explicit consideration of ethics, the role of facilitators and adequate monitoring and evaluation.

Some challenges remain, however, in relation to the last two essentials. The link between inner change and practical action was not sufficiently clear for several participants, who expressed a need for more guidance on connecting inner transformation with societal engagement. Suggestions included practical, operational tools for activism, stronger links to climate organisations and concrete examples of transformative action. The principle of quality education (fourth essential) was reflected in the authentic sharing of the monastics, which many participants found impactful. Challenges persist, however, in monitoring and understanding how inner-outer transformation develops across participants' professional contexts and broader social systems.

Discussion and conclusions

In this section, we explore the interconnections among the identified results, reflect on the role of spirituality in this context and discuss the broader significance of our findings — particularly in relation to the No Limits to Hope initiative.

Interconnection of inner-outer processes

The themes and patterns identified in the results section are not discrete but deeply interwoven. Changes in meaning-making often led, for example, to a more grounded and sustainable hope and reduced anxiety, which in turn, supported an expanded sense of agency (cf. Macy & Johnstone, 2022). Rather than centring individual control, many participants emphasised relational agency or participatory responsibility (cf. Walsh et al., 2020; West et al., 2024). These internal shifts were reflected in changes in engagement and behaviour, in a number of cases leading to broader ripple effects across individual, interpersonal and systemic contexts. For example, one participant described how seeing themselves as a node in the web of life (meaning-making) helped them accept collapse without despair (hope) and encouraged them to speak out in their organisation despite fear (agency). Another participant noted that understanding suffering as a universal experience allowed them to approach interpersonal conflict with greater openness, leading to improved relationships and an expansion of trust within their family and colleagues (ripple effect; cf. Everard et al., 2016). These examples demonstrate that personal insights are not isolated, but unfold through a cascading process of inner and outer transformation.

Spirituality served as both the catalyst and the container for these transformations. Through teachings on interbeing, impermanence, presence, attention, insight and compassionate action, participants were able to access a deeper clarity and resilience. This transformation was neither linear nor absolute. Participants openly acknowledged moments of contradiction, ambivalence and regression, emphasising the ongoing and relational nature of change. In this way, the ZASP course functioned as a dynamic field for cultivating personal insight, collective awareness and engagement.

Concrete actions and ripple effects were described across all levels. These included changes in lifestyle (e.g. consumption habits), initiating difficult conversations within families or communities or contributing to workplace sustainability dialogues. Nonetheless, translating insights into sustained action remained uneven.

Validity, credibility and broader significance of outcomes

The assessment of pre- and post-course surveys across all ZASP cohorts strengthens the credibility, validity and broader significance of our findings. Statistically significant outcomes included a 76% increase in participants feeling more connected, hopeful, empowered and better able to cope with climate change; an approximately 60% improvement in their ability to recover from stress

and challenges; and an approximately 60% decrease in climate anxiety (Wamsler, 2026). Approximately 85% of respondents reported powerful "Aha! moments," and around 80% described meaningful changes in their lives. These changes primarily involved shifts in participants' relationships with themselves, others, the natural world and time — manifesting as reduced anxiety and despair, as well as increased presence, connection, self-care, resilience, joy, hope, agency and engagement. Among those who spontaneously reported behavioural changes, about 65% referred to personal-level shifts, 25% to broader societal or systemic changes and roughly 10% to concrete actions related to sustainability and climate activism.

Reconsidering the role of spirituality

Spirituality emerged across our data not merely as a background theme but as a generative force. For many participants, spiritual frameworks were instrumental in making sense of their experiences and fostering deeper engagement. Without being prompted, many referred to spiritual concepts that helped them shift unsustainable patterns of being, thinking and acting. This is further supported by the assessment of pre- and post-course surveys across all ZASP cohorts (Mundaca & Wamsler, 2025; Wamsler, 2026).

The teachings of mindfulness, interbeing and impermanence offered more than contemplative insight; they actively shaped new ways of feeling, thinking and acting in a world marked by ecological and social crisis. Refocusing the mind inward coincided with a shift towards prioritising intrinsic over extrinsic determinants of meaning, hope, agency and engagement — a pattern that was consistent across all domains. Spiritual practices helped participants reorient their values and redefine success — not in terms of control or certainty but in terms of connection, intention and compassion. In doing so, spirituality also supported a form of engagement that was less driven by anxiety and more rooted in presence. By reframing suffering as a gateway to transformation and self-compassion, spirituality enabled participants to integrate difficult emotions rather than bypass them. This integration was critical for fostering resilient hope and reducing the likelihood of burnout. It also helped people to recognise and sit with inherent paradoxes at the heart of responding to the ecological emergency. As the practice of mindfulness grounded participants in the present moment, they gained the emotional bandwidth to respond with clarity rather than reactivity — thus deepening their agency. Together, these shifts nurtured a more integrative and sustainable form of spiritual and secular engagement.

Importantly, spirituality also provided a language and a community for making sense of old and new experiences, as well as for holding contradiction (cf. Ives et al.,

2023b). Whether facing moments of despair or doubt or grappling with institutional inertia, participants drew on spiritual concepts and collective insights to remain grounded in purpose. It provided participants with words and orientation for making sense of their insights and inner shifts, while also connecting personal transformation to broader ecological, ethical and systemic perspectives. In this sense, it offered an alternative to dominant economic and sustainability approaches in modern societies, which have been shown to reduce people's sense of connection, meaning, and agency (cf. Wamsler, 2026; Wamsler & Björkman, 2026).

But was it the spiritual dimension itself that enabled change, or was it the process of being invited into new ways of seeing and being — something also offered by secular courses — that made the difference?

The spiritual teachings and concepts — such as interbeing and impermanence — provided participants with a narrative through which to understand their lives and challenges. However, the impact may lie less in the specifically spiritual grounding of these teachings and more in their universal character and their psychological and relational resonance (cf. Bucher, 2007; Rowson, 2014; Wamsler et al. 2025). They appear to have helped participants restore a long-sought balance between spirituality and utility, the spiritual and the material, the intrinsic and the extrinsic — as fundamentally integral aspects of life and purpose (cf. Rowson, 2014).

Not all participants, however, felt equally connected to the spiritual framing, highlighting the need to consider spirituality within a complex, religiously hybrid world (Stacey, 2024). These tensions point to the need for flexibility and inclusivity in the design of transformative learning environments — spaces that can accommodate both spiritual and secular forms of reflection and that validate complex, non-linear journeys of change.

Concluding remarks: no limits to learning and hope

Our study provides new insights into inner–outer transformation processes across scales and how these can be supported through educational activities and extrapolated to broader educational settings. It explored the ZASP course — an innovative educational intervention and related practices — designed to address the challenges of the Anthropocene and the fractured relationship between humans and nature.

The ZASP course reveals the profound potential of reflective, values-based education — whether framed as spiritual or not — for fostering meaning, hope, agency and engagement. It shows that faith-based organisations, by embracing both spiritual depth and critical openness, can play a pivotal role in nurturing the inner

and outer transformations needed for a more compassionate and sustainable world.

The ZASP course is part of an emerging movement and ecosystem of individuals and organisations seeking to integrate inner human dimensions with sustainability to catalyse societal transformation (e.g. IDG, 2021; Walsh et al., 2020; Wamsler et al., 2024, 2025). This movement marks a significant shift away from modernist paradigms centred on "no limits to growth" towards "no limits to learning," emphasising the role of human capacity and potential (Meadows et al., 1972; Botkin et al., 1979; Woiwode et al., 2021).

It also represents a departure from material growth-driven approaches, foregrounding the critical importance of inner development in addressing global challenges (Wamsler & Björkman, 2026). The evolution from a focus on *"inner dimensions of sustainability and systems transformation"* to the emerging No Limits to Hope initiative reflects a growing emphasis on deep leverage points for societal change — especially those engaging the philosophical and ethical dimensions of sustainability (Bristow et al., 2024; cf. Meadows et al. 1972). Related scientific literature emphasises the need to address mindsets, behaviours, cultural norms and systemic structures in combination to achieve meaningful transformation (Ives et al., 2023a; IPBES, 2024; Wamsler et al., 2021).

Our findings underscore that lasting societal transformation, in this context, requires the creation of environments that support the active exploration of meaning, hope, agency and imaginaries across diverse communities and time horizons. They emphasise the relevance of incorporating traditional knowledge and Indigenous wisdom into related educational approaches, future learning designs and policy development to empower educators and practitioners to become drivers of change.

By fostering inclusivity, the ZASP course demonstrates that transformation is not confined to any single belief system but can be enriched by multiple philosophies and worldviews. This open, pluralistic approach enables deeper engagement with the complex challenges of sustainability, ensuring that both spiritual and secular perspectives can meaningfully contribute to our collective journey.

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Chapter 4

Understanding the Revolution

Revolutions are rarely recognised while they are happening. They are more often felt as discomfort, as disorientation, as the slow but gathering sense that the frameworks we have been using to make sense of the world no longer quite fit the world they were made for. We are living through such a moment now, and education sits at its centre. Writing from a prison cell in Mussolini's Italy, Antonio Gramsci observed that "the crisis consists precisely in the fact that the old is dying and the new cannot be born; in this interregnum a great variety of morbid symptoms appear" (Gramsci, 1971). He was writing about politics, but the observation applies with equal force to education today. The frameworks that have organised formal learning for the better part of two centuries, transmission over inquiry, efficiency over complexity, the individual rational learner over the relational, are visibly inadequate to the world they are now asked to prepare people for. And yet the new has not fully arrived. What we inhabit is precisely the interregnum Gramsci described: a period in which old paradigms retain institutional inertia even as they lose explanatory and generative power, and in which the symptoms of that failure are everywhere, in rising ecological anxiety, in the disconnect between what is taught and what is needed, in the growing sense that education is producing graduates who are technically capable and humanly underprepared.

The question this chapter takes seriously is whether the changes already underway in how educators, researchers and learners are thinking about knowledge, relationships and the purpose of learning constitute something more than incremental reform, whether they collectively add up to what might genuinely be called a revolution in educational thought. The word revolution carries weight, and it is used here deliberately. Thomas Kuhn's account of how scientific revolutions happen is instructive: genuine paradigm shifts do not occur when anomalies are smoothed over by adjustment but when the accumulation of anomalies becomes so great that the existing framework can no longer absorb them, and a new one emerges to reorder what was previously incoherent (Kuhn, 1962). The anomalies in contemporary education are no longer subtle.

A system designed for industrial-age efficiency and linear problem-solving is categorically unsuited to prepare learners for complexity, uncertainty, and systemic change. Universities took shape under a mechanistic and separatist worldview that embedded anthropocentrism into the very architecture of higher education, separating disciplines from each other, from nature, and from holistic ways of knowing (Snick & Sharar, 2022). A conception of the learner as an independent, rational self, shaped by Enlightenment rationalism and liberal modernity, distorts the relational nature of being and actively contributes to the ecological harm it claims

to be addressing. An education that treats nature as a backdrop or a resource to be managed rather than as an intelligent, communicative and morally significant community of life, reproduces the anthropocentric worldview that has brought us to the edge of planetary breakdown.

Revolutionary thinking in education is not new, and it is important to say so. The tendency of dominant educational histories to locate radicalism primarily in 20th-century European and North American traditions obscures a far longer, wider and more diverse record of people who understood that the transformation of education is inseparable from the transformation of the world. In colonial Bengal, Rokeya Sakhawat Hossain went door to door in 1909 to recruit the first students for what would become the Sakhawat Memorial Girls' High School in Calcutta, India's first school for Muslim girls, founded in 1911. She was simultaneously writing feminist utopian fiction that imagined societies organised on entirely different principles of knowledge, power and human flourishing, most notably *Sultana's Dream* (Hossain, 1905). Hers was a revolution in the fullest sense: at once institutional, intellectual and deeply personal. Decades later, the Egyptian playwright and intellectual Tawfiq al-Hakim, in his essays collected as *Thawrat al-Shabab* (The Revolt of the Young), gave the intergenerational tension at the heart of educational change its most precise name: "the cry of the whole age," the awakening of a generation that refuses guardianship over its own future and insists on shouldering the responsibility of changing the world (al-Hakim, 1984/2015). They are antecedents that this chapter's contributors, whether or not they name them explicitly, are working in the spirit of.

Perhaps the most consequential and most consistently overlooked revolutionary tradition in education are the living knowledge traditions of Indigenous peoples worldwide. Robin Wall Kimmerer has described in *Braiding Sweetgrass* how Indigenous ways of knowing rest on a fundamentally different relationship with the natural world, one built on reciprocity and gratitude, rather than on observation from a distance, and grounded in what she calls "the grammar of animacy," the recognition that the living world is not a collection of objects to be studied and managed but a community of subjects to be listened to and learnt with (Kimmerer, 2013). This is an epistemological position with direct implications for how learning is understood, what counts as knowledge and who or what is considered a teacher. For Kimmerer, the plants, the waters, the soil and the seasonal cycles are themselves pedagogues, and the first act of education is attentiveness rather than acquisition. This orientation, dismissed for centuries by the institutions of Western modernity as superstition or pre-scientific thinking, is now slowly being recognised by systems ecologists, complexity theorists and cognitive scientists.

Kimmerer is not alone in making this case. The Māori scholar Graham Smith has argued for what he calls *kaupapa Māori* as a transformative educational praxis: a framework in which Indigenous language, culture, and values are not supplementary additions to an otherwise Western curriculum but the constitutive ground from which learning proceeds and from which communities reclaim the authority to define what education is for (Smith, 1997). In *Decolonising the Mind*, the Kenyan author Ngũgĩ wa Thiong'o showed how the imposition of colonial language and knowledge systems operated as a systematic dismantling of the educational imagination of entire peoples and argued that the recovery of that imagination was itself a revolutionary act (Ngũgĩ wa Thiong'o, 1986). What these thinkers share, across very different contexts and traditions, is the insistence that the dominant educational paradigm is not universal. The knowledge systems it has marginalised or erased carry the relational, ecological and intergenerational wisdom that the present crisis demands. Centring Indigenous knowledge in education is a structural revolution in the architecture of knowledge itself. It brings to the forefront the questions of who is considered a knower, what is considered worth knowing and how the relationship between human learning and the living world is understood.

This is where the present revolution connects most directly to the human gap identified by the Report to the Club of Rome - *No Limits to Learning* (Botkin et al., 1979). The gap between humanity's capacity to act upon the world and its capacity to understand and govern the consequences of that action is a gap in relational knowledge, the knowledge of how to live within systems. The Club of Rome's more recent The Fifth Element programme argues that what is now required is nothing less than a human revolution: a fundamental reconciliation of humans with themselves, with one another and with life in all its forms, driven by deeper modes of learning that go well beyond the transmission of knowledge to transform how we see, sense and relate (Álvarez Pereira et al., 2025). The revolution this chapter is mapping is, in part, the beginning of that reconciliation: the difficult but necessary work of reintegrating what was separated, and relearning what was forgotten.

That recovery does not require abandoning the insights of Western science or the critical tradition of modern education. It requires, as Bruno Latour argued in *Down to Earth*, that we land: that we return from the deterritorialised, abstracted, ecologically disembedded ways of knowing that modernity produced, and re-engage with the terrestrial systems that sustain life, on their own terms (Latour, 2018). Latour's provocation was that Western modernity had never actually separated itself from nature, as it claimed; it had only stopped paying attention to what it was doing to it. This is also, at its core, what Paulo Freire meant when he argued that education

is never neutral, that it is always already oriented towards either the reproduction or the transformation of the world that produces it (Freire, 1970). To understand the revolution is to understand that this choice is made continuously, in every pedagogical relationship, every design decision, every act of listening or foreclosing.

The six contributions gathered in this chapter understand this. Each, from a different disciplinary and cultural vantage point, is engaged in the work of the interregnum: navigating between a paradigm that is dying and one that is not yet fully born, with the clarity to name what is failing, the courage to imagine something different and the practical commitment to begin building it now. Oliveira opens the chapter by arguing that regenerative practices offer not merely a set of ecological methodologies but a paradigm that reconfigures education as an adaptive, life-generating system, and reframes learning as an ongoing process of co-evolution between learners, communities and ecosystems. Bruhn extends this into cosmological territory, proposing that the Anthropocene itself can be understood as a civilisational threshold, disorienting and dangerous, but generative of new forms of consciousness and aliveness, and drawing from this a set of pedagogical orientations built around relationship-building, compassionate accompaniment of what is passing and genuine celebration of what is emerging. López Solís grounds the argument in the more-than-human world directly, showing how fields as varied as cognitive ecology, ethology and bioacoustics provide growing scientific evidence that intelligence is not a uniquely human attribute but an inherent characteristic of life and that an education informed by this recognition could cultivate wonder, compassion and an ecocentric ethic that prevailing anthropocentric curricula systematically foreclose. In doing so, her contribution resonates directly with Kimmerer's insight that nature is not an object of study but a community of teachers and that restoring that relationship is itself an educational act of the highest order.

González provides the chapter's temporal anchor, recovering the Bariloche Foundation's 1976 challenge to the Northern development paradigm as a reminder that the revolution in educational thought has deep and non-Western roots. Carlos Mallmann's model of nine human needs, developed in close relationship with the *No Limits to Learning* report, offers a framework of synergy, solidarity and conscious stewardship that was available in the 1970s and largely eclipsed by the turn to neoliberalism. Understanding the revolution requires understanding what was foreclosed in addition to what is newly emerging, and González's contribution is a recovery of resources that were always present but have been waiting for a moment when their relevance would be impossible to deny. Kokshagina, Neurohr and Nastar take up the most contested tool of the present moment, artificial intelligence, and ask

what, in careful collaboration with collective intelligence and participatory design, it might make possible for learning transitions that bridge knowledge and action. Their framing resists both the techno-optimism that treats AI as a solution and the technophobia that treats it as a threat, holding instead the more demanding question of how any tool can be placed in the service of values and relationships. Silova, Rappleye and Komatsu close the chapter's arc with a contribution that is both philosophical and urgent, a call to learn with the world rather than simply about it, drawing on Indigenous knowledge systems, animist cosmologies, African philosophies and Asian pedagogies to build a conception of learning as participatory, relational and ontologically transformative.

What holds these contributions together is a shared refusal to accept that education's deepest purpose is the reproduction of the world as it is. Hope, in this framing, is a commitment to keep the future open.

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Regenerative practices as a paradigm shift in transformative learning

*Lígia Oliveira**

Abstract

Education systems were never designed to handle collapse. As planetary and socio-economic instabilities accelerate, the gap between what we teach and what we need to know becomes impossible to ignore. Conventional learning models, designed for industrial-age efficiency and linear problem solving, fail to equip learners to navigate complexity, uncertainty and systemic change. In contrast, regenerative practices offer more than a set of ecological methodologies: these provide a paradigm that reconfigures education as an adaptive, life-generating system.

This paper explores how regenerative design, when integrated with artistic and pedagogical innovation, can catalyse transformative learning. By fostering ecological literacy, complex systems thinking and creative agency, regenerative learning cultivates a mindset attuned to interdependence and long-term resilience. Drawing from case studies in design and speculative pedagogy, this research examines how these principles reshape cognitive, spatial, and institutional approaches to education.

Using qualitative inquiry and interdisciplinary analysis, it explores how regenerative principles can decolonise and reorient learning spaces. Education is reframed not as transmission of knowledge, but as an ongoing process of co-evolution between learners, communities and ecological systems. Embedding regenerative design into educational structures enhances adaptability and nurtures an embodied sense of stewardship and pragmatic hope — both critical in times of crisis.

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Ultimately, this paper calls for an urgent reconfiguration of education as a living system. Learning environments — physical, conceptual or digital — must be designed as symbiotic, decolonised and flourishing-oriented ecosystems that enable the emergence of regenerative worlds.

Keywords: Regenerative design, relationality, systemic change, ecological literacy, pedagogical innovation, embodied education

Introduction: The collapse of the educational imagination

In most Western contexts, education systems still operate according to logics designed for a world that no longer exists. The 20th-century pedagogical infrastructure, forged to sustain industrial societies, remains remarkably intact: knowledge organised in disciplinary silos, outcome-based assessments, decontextualised curricula. Its implicit promise was of stability, predictability and progress.

But today's instability — ecological, social, symbolic — is no longer the exception; it is the rule. Climate crisis, biodiversity collapse, structural inequality and political disillusionment all point to a civilisational model reaching its limits. At the heart of this exhaustion lies the failure of an educational imagination capable of preparing human beings for complexity, uncertainty and systemic transformation.

Instead of replicating systems, we need to prepare learners to reimagine and regenerate them: for their own flourishing, and that of others. The 1979 *No Limits to Learning* report identified the "human gap" between what we know and what of that knowledge are able to apply. This was not simply informational, but institutional, cultural and relational. And decades later, that gap has widened into an abyss.

What we face now is not an educational content crisis, but a paradigm crisis. No amount of digital tools or curricular reform will bridge the rupture between current models and the capacities our world demands. We need a shift from extractive, linear and competitive approaches towards adaptive, relational and regenerative forms of learning.

In this context, regenerative practices emerge not only as an ecological methodology but as a transformative pedagogical paradigm: an invitation to reorganise education as a living system, capable of generating meaning, care and responsiveness in times of collapse.

This requires more than a cognitive shift: it calls for an ontological one. Today's learners are increasingly disconnected from place, from each other, from more-than-

human worlds. That disconnection is not incidental: it is pedagogical. It reflects the erosion of a sense of belonging, of being embedded in a web of relations in which learning is not separate from living or from land and knowledge is inseparable from care. This is what Celidwen and Keltner (2023) frame as "kin relationality" and "ecological belonging": an ethics of interdependence, responsibility and reverence for life.

To regenerate learning, we must reconfigure not only what we teach, but who we are in relation to the world. Education must become relational, embodied, situated. It must cultivate a capacity to feel, to attend, to respond. In this light, learning is not preparation for life: it is participation in it. A practice of becoming-with, not mastering-over.

Only learning processes that are interdisciplinary, situated, poetic and systemic can activate the ways of knowing and being needed to navigate this century with dignity, and to support the flourishing of life's complex web of relations, including our own. What is at stake is not just what we know but how we live. Not only what we teach but how we become apprentices of a world in constant metamorphosis.

The fallacy of transmission: theoretical obstacles to educational transformation

Much of mainstream Western education still treats learning as transmission: knowledge moves from expert to novice, through fixed curricula, as if information were a commodity passed along a supply chain. Rooted in epistemologies of control, this model views learning as linear accumulation — isolated, extractive and abstract — rather than as the interdependent cultivation of capacities in living systems.

This reflects an outdated pedagogy and a cosmology that separates humans from one another and from the world that sustains them. It privileges mastery over relation, abstraction over context, productivity over meaning. This model has shaped everything from curricula to classroom architecture and performance metrics, narrowing what is valued while suppressing other ways of knowing.

Within this framework, uncertainty becomes a threat to be managed, not a condition to be navigated, felt and learnt from. It reinforces a mechanistic worldview: the mind is detached from the body, the learner from the community, the school from the biosphere. Emotion, intuition and embodied knowing are sidelined. And most critically, it prepares learners for a world that no longer exists.

We must begin by questioning this foundation. The challenges we face are

not technical puzzles to be solved through improved instruction but symptoms of systemic dysfunction: emergent, entangled, uncertain. They demand not more content but new capacities: to perceive patterns, hold paradox and act with care in conditions of complexity and crisis.

These capacities are relational, embodied and contextual. They emerge through situated practices of attention, interaction, presence and reflection. The failure of transmission lies in treating learners as passive observers rather than participants in co-evolving systems.

It also divorces learning from living. Instead of helping people engage ethically and imaginatively with the present, it prepares them for an imagined future based by outdated assumptions. But the future is unwritten, unpredictable — and our task is to co-create it.

Regenerative pedagogy begins from a different premise: that knowledge is not a product, but a relationship. That it grows in community, across generations, with and through place, requiring presence, trust and reciprocity. And finally, that it thrives not in silos but in ecosystems.

What is in question, then, is not only the model of transmission but the theoretical architecture that sustains it: one that cannot cope with complexity, instability or urgency. This architecture rests on three fallacies:

- Linearity: the belief in predictable cause and effect, in a world shaped by tipping points and feedback loops.
- Abstraction: the separation of knowledge from context, in systems that are embodied, situated and historical.
- Neutrality: the assumption that knowledge can be transferred without changing who learns, and who teaches.

As *No Limits to Learning* noted, what blocks transformation is not a lack of information but a gap between what we know and who we are able to become. Therefore, what kind of learning theory can bridge that gap, in a world of collapse?

Regeneration as a paradigm: more than sustainability with better metrics

If 20th-century education was built to serve economies of scale, 21st-century learning must serve ecologies of care. Regeneration is often misunderstood as a refinement of sustainability, an upgraded toolkit for reducing harm. But

regeneration is not optimisation: it is a paradigm shift, grounded in a radically different understanding of life, learning and relations.

Sustainability aims to preserve; regeneration seeks to heal and co-create. It reframes education beyond a neutral delivery system, as a living process situated in time, place and relation. It calls for learning systems that evolve, adapt and respond — not to predict futures, but to co-create them. In these systems, each learning act reinforces the vitality of the system, instead of extracting from it.

A regenerative approach to education asks: What kind of learning helps people live in right relationship with themselves, with others and with the more-than-human world? What kinds of practices cultivate resilience, reciprocity and responsibility? These are not interventions in inert systems in which knowledge is a product, but participation in living systems in which relationships are cultivated collectively, contextually and with reciprocity.

To clarify the contours of this shift, the following comparison (Table 1) contrasts the transmission paradigm with regenerative learning. It marks not just a pedagogical difference but a civilisational turn:

Table 1. From transmission to regeneration: a paradigm shift

Transmission paradigm	**Regenerative learning paradigm**
Knowledge is content to be delivered	Knowledge is a relationship to be cultivated
Learners are passive recipients	Learners are co-evolving participants
Education prepares for the future	Education co-creates present and emergent futures
Teaching is top-down and standardised	Learning is participatory and adaptive
Success defined by metrics	Success defined by process
Environment is background	Place and ecology are learning agents
Mind and body are separated	Embodied knowing is central
Theory and practice are split	Knowledge is embodied through action
Individual achievement	Communal flourishing

But regeneration is not only a shift in framing: it is a shift in depth. It asks us not just what we teach but how we learn to perceive, relate and act differently within living systems. It draws on Indigenous knowledge, artistic research, speculative design and somatic methods not as alternatives to science but as co-intelligences that

allow us to learn with, not over, the world.

This shift is not about abandoning rigour. It is about widening our sense of rigour to include presence, intuition, interdependence. Regenerative education does not begin with "What should we teach?" but with "What does this time, this place, this ecology asks us to learn — and how?"

To regenerate is not merely to repair, but to re-inhabit: the body, place and the ethical ground of learning. Regenerative education begins with presence, with the capacity to witness, to attend, to respond. This is where learning becomes more than adaptation: it becomes a practice of relationship, integration and, therefore, belonging. This calls for educators to be facilitators of connection and meaning-making and for institutions to be systems that support life, potential and kinship with Earth. Regenerative practices provide a paradigm that reconfigures education as an adaptive, life-generating system, echoing Kimmerer's (2013) view that learning with the land fosters relational and reciprocal knowing.

The following section explores four foundational pillars of this learning paradigm. Together, they point towards an education worthy of the challenges, and possibilities, of our time.

Four pillars of a regenerative learning paradigm

Drawing from artistic, ecological and pedagogical traditions, this paradigm rests on four interwoven propositions. These outline a stance, a way of being and learning in the world that responds to collapse not with control, but with regeneration. If regeneration sounds idealistic, it's only because we have been trained to mistake dysfunction for realism.

These four shifts articulate a new theory of learning: one that is relational, embodied, contextual and alive. Regenerative education situates learning within cycles of interdependence, renewal and responsibility.

1. Relationality as epistemological core

Learning is not a delivery system but a cycle of relation. The dominant Western paradigm imagines learning as content flowing from expert to learner, from institution to society. Rooted in industrial modernity, this logic flattens learning into a scalable transaction, which is inadequate for cultivating wisdom, discernment or care.

Regenerative learning reframes knowledge as emergent through interaction: with people, places and more-than-human worlds. Learning becomes co-becoming,

not consumption. It foregrounds interdependence, reciprocity and connection as epistemological foundations.

Pedagogically, this means classrooms become communities of mutual care; curricula are rooted in place; students and teachers co-inquire into shared life. This is a shift from technique to relationship, from extraction to participation. Learning is not an individual act of accumulation but participation in the system's life: to attune, to adapt, to contribute. It implies reciprocity.

2. Mythos and meaning as epistemic ground

Modern education assumes method is neutral, but every approach to learning carries a mythos: a worldview, values, a theory of reality. Regenerative learning draws from cosmologies of interdependence, emergence and cyclical time — something closer to Indigenous and ecological knowledge than to Cartesian logic.

Here, knowledge is not control over the world but relationship within it. Education becomes ontological: not just knowing but being and becoming. Regenerative paradigms honour story, ritual and ancestral memory as essential carriers of knowledge and deep companions to science.

Rigour expands to include the intuitive, the ancestral, the felt, those ways of knowing that allow us to live well with complexity and care. Rather than appropriate Indigenous epistemologies, regenerative learning must listen, respect, honour and repair with humility and accountability.

3. Embodied ecologies

In dominant models, the body is disciplined into absence. Learning becomes abstracted from lived experience, mind separates from flesh, theory from land. Regenerative education reclaims the body as our first site of knowing, as our most complex sensorium.

Cognition is somatic, emotional, contextual. The body, land and cultural rituals are infrastructures of knowledge. Learning is movement, community, breath, climate, soil. This is not metaphor: it is epistemological ground, long affirmed by Indigenous, somatic practices and scientific research, such as that of Varela et al. (1992).

Place, too, is not a backdrop: it is teacher. Land shapes cognition; weather teaches temporality. Regenerative curricula are place-based inquiries, in which body and ecology co-produce meaning. In this paradigm, presence is the first ethic. Regeneration begins with belonging, and belonging begins with attention.

4. Curriculum is emergent

Regenerative education is a living, adaptive ecosystem, shaped by learners, communities, place and context. Learning emerges through participation, experimentation and care. It listens before it speaks.

This marks a shift from static syllabi to emergent architectures. Learners co-create inquiry paths responsive to the needs of their communities and ecologies. Educators become stewards of process; institutions become facilitators of relational intelligence. Curricula are iterative, collective and rooted in the ethics of regeneration: restoring what was harmed, amplifying what gives life, composting what no longer serves. In this, the curriculum itself becomes a site of transformation, and a living field of possibility.

Towards an education worthy of the future

These four pillars outline a learning paradigm that is ontological, ecological, embodied and participatory. They offer a way beyond transmission towards imagination, agency and co-creation.

In an age of collapse, regeneration is not utopian: it is a necessity. Education must become more than preparation for a disappearing world: it must help co-create the worlds that are still possible.

Regenerative learning draws from multiple intelligences: cognitive, artistic, ecological, somatic. Practices such as ecological design, land-based arts, storytelling and ritual are not peripheral but central technologies of transformation; they acknowledge that learning is to shape the world, internally and externally.

Design and art are methods of attunement to living systems and play key roles in forming a different ontology of learning. Aesthetics, symbols and rituals are fundamental relational infrastructures offering shifts from transmission to relation, from extraction to renewal, from content to care.

This is not reform: it is re-inhabitation. It is pedagogy as possibility, as presence, as life.

Ontological learning: body, place and culture as living infrastructures

If the regenerative paradigm reframes learning as a life-generating process, its most radical implication is this: to learn is not merely to think but to become. We are not disembodied minds acquiring abstract data but porous, interdependent beings immersed in the ecologies of place, culture and relation.

Mainstream education, rooted in Enlightenment rationalism and industrial utilitarianism, often treats learning as a neutral, cognitive process. But learning is never neutral: it reflects power, place, worldview. The ways we are taught to know are inseparable from the ways we are taught to exist.

Regenerative education invites us to reconfigure learning ontologically: not as accumulation but as transformation. From knowing about the world to knowing *with* it. This is a shift from cognition as control to cognition as relation: a reweaving of suppressed ontologies rooted in reciprocity, ritual and attention.

To regenerate learning, we must ask:

- What modes of perception and practice enable humans to live in right relation?
- What pedagogies restore connection — within ourselves, with our communities and with more-than-human life?

In this view, the body is not an obstacle to cognition but its medium. Sensory perception, emotional resonance and intuition are not distractions, but epistemic tools. The body becomes an infrastructure of care and discernment, while culture, instead of decorative, is acknowledged as the soil where meaning grows. Together, body, place and culture are not contexts for learning, but living infrastructures of education.

This is not a metaphorical shift: it is methodological. Regeneration must function not only as a poetic ideal, but as a systemic and situated pedagogical practice. It demands a shift from performance to presence, repetition to reciprocity, control to care.

In regenerative learning, place matters. A river is not merely a case study: it is a teacher. A coastal festival is not simply a cultural event: it is a pedagogical ecology. Here, students don't just study sustainability; they experience interdependence, rehearse responsibility and practise reciprocity. These are processes to be experienced: recursive, reflexive and relational in nature.

Listening, in this frame, becomes a method: awareness of the land, the more-

than-human, seasonal cycles and community stories. Noticing the body's signals of emotion, sensation, values. This pedagogy of presence, care and attention are critical competencies to understand and navigate complexity.

Ontological learning recognises that who we are becoming is inseparable from how we learn. Regenerative education restores learning to the cycles of life, in which knowledge arises not through extraction, but through relation.

Methodological implications

Methodologically, this approach draws on qualitative, practice-led inquiry. It emerges from both facilitation and participation in educational contexts, formal and informal, that explore learning as ecological, embodied and poetic. It weaves lived experience, artistic research, speculative design and contemplative practice. Furthermore, it favours rituals, sensory mapping, metaphorical storytelling, site-specific interventions, ecological co-design. These practices reveal a more-than-cognitive dimension of learning where the researcher, teacher and learner are participants shaped by and shaping the system.

The researcher, in this model, is a me-searcher: someone engaged in situated co-evolution. Reflexivity is not an add-on, but a structural necessity: we learn by changing with what we observe and with whom we observe and by being aware of those processes. The boundaries between research and ritual, science and devotion, becomes porous: not due to imprecision but out of fidelity to complexity.

This approach is neither universal nor prescriptive. It is rooted in place, bodies, histories and committed to pluralism. It seeks not singular answers, but an ecology of approaches that nourish learning across contexts. Rather than importing external frameworks onto local realities, regenerative education begins with the specificities of place and community. It asks:

- What needs to regenerate here?
- What forms of knowing have been silenced?
- How does this place want to be learnt from?

When institutions take this seriously, curricula shift from static syllabi to dynamic inquiry. Evaluation expands beyond metrics to include reflexivity, ecological embeddedness and collective agency. Classrooms open to gardens, kitchens, rivers, archives, forests, the sea. Learners are not trained only for the labour market but to stay with complexity, hold contradiction and act with care.

In regenerative contexts, methodology cannot be separated from ethics. Research becomes a practice of listening, honouring relationships and refusing to instrumentalise the world for insight alone. It must serve something larger: life.

While this article does not present formal case studies in the traditional sense, it is grounded in a constellation of situated practices that I have co-created and observed. Drawing from previous research (Oliveira, 2023; 2025), the approach proposed here involves direct, repeated engagement with natural elements or ecosystems, where observation, care, contemplative and embodied presence guide regenerative learning. One example is Liquid Kin, an ocean community festival co-curated with the TBA21-Academy, where regenerative learning was integrated through embodied workshops at the intersection of science, art and ecology. There, participants rehearsed new relational grammars: not just learning about the ocean, but with the ocean and each other, through gesture, ritual, listening and action.

Other entanglements include approaches developed through the SpeculativeEdu initiative and consolidated in *Beyond Speculative Design* (Mitrović et al., 2021), which explores how critical design and futures literacy can reframe education. And also practices that foreground the body as epistemic site, with other species and the land as co-creators — challenging human-centric paradigms and contributing to Rights of Nature approaches, as developed by members of the Design+Posthumanism Network. Across these contexts, what emerges are qualitative, interdisciplinary, relational frameworks united by an ethos: learning as relational healing and imaginative reconstruction. And where education is not a rehearsal for the future but a co-creative act of hope in the now.

Finally, this article employs a qualitative and interdisciplinary lens to explore the conditions under which regenerative principles can reorient learning spaces, drawing on Yunkaporta's (2019) articulation of Indigenous ways of knowing as complex, pattern-based modes of meaning-making that emerge through story, relation and place.

Conclusion: Learning as living system, education as active hope

We no longer live in a world where incremental improvements to education are sufficient. The assumptions that sustained the industrial model — stability, control, predictability — are outdated and even dangerous, if we consider the dimensions of our challenges and circumstances. In an era of collapse, learning must become something else.

This article does not propose a new curriculum, a method tweak or a pedagogical add-on. Its premise is more radical and more necessary. It calls for a foundational shift: reframing education as a living system where regeneration is the framework. This is the only pedagogical paradigm capable of sustaining life with dignity on a collapsing planet.

To educate for regeneration is to root learning in reciprocity, to orient it towards wholeness, and to co-evolve with the world it inhabits. It is a refusal to separate knowledge from care or learning from life. What regeneration offers is a framework for repair, a practice of re-entanglements: with body, place, story and community. It grounds learning in the cycles and systems that sustain life: soil, water, breath, kinship, presence. It recognises that learning is not a way to escape collapse, but a means to compost it into culture. Not only that, it insists that we are not just teaching content: we are shaping cultures of attention, infrastructures of belonging and modes of care. And that we're all changed in that process, as constant teachers and learners.

This calls for institutions to become spaces of refuge and regeneration, not just production. It asks for educators to be facilitators of emergence, not enforcers of content. For learners to become apprentices of life: not in control of it, but in service to it.

In doing so, regenerative practices answer the challenge posed by *No Limits to Learning* nearly half a century ago: the human gap between what we know and how we live. That gap is not informational but ecological, relational, existential. And it will not be bridged by more data, better metrics or faster innovation: it requires a new educational imagination, one that honours interdependence, embraces complexity and restores learning as a generative force within the web of life.

To learn regeneratively is to remember that we are nature learning about itself. Learning becomes then an act of re-membering: that we belong to living systems, and that systems can be healed. In this task, the body becomes our compass, and the Earth becomes our curriculum. We are called not to teach *about* the world, but to learn *with* it: through care, humility and kinship. Regenerative education is not a niche or ideal; it is a cultural infrastructure of radical commitment to life.

There are no guarantees. But there are openings. Regenerative education is a choice to become responsive again. To listen again. To co-create conditions for life to continue and to flourish.

In that, there are no limits to learning. And no limits to hope.

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Biographies

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Trustfully moving into the polycrisis of the Anthropocene as another birth in the process of human becoming

Thomas Bruhn[*]

Abstract

In this paper, I reflect on the emergence of the Anthropocene as a hopeful transformational phase in the process of human becoming and in the evolution of life towards greater complexity and consciousness.

Drawing on perspectives from Earth system science, complex systems theory and social psychology, I propose an interpretation that understands the Holocene as the systemic "womb" of the current global civilisation, and the transition into the Anthropocene as a civilisational "birth" within the ongoing self-organisation of life on Earth. I argue that cultivating awareness of the impermanence of the current civilisation can serve as a crucial resource for catalysing an emerging mode of (human) life on Earth, grounded in a healed relationship between human and non-human life.

For learning and educational systems, these reflections carry profound implications. I discuss a hopeful orientation towards aliveness as a key principle for shifting the underlying logic of educational practices away from a mindset of "responding to challenges" or "solving problems" and towards nourishing processes that are congruent with patterns of healthy aliveness. Specifically, I propose that designers and facilitators of transformational learning processes focus on four aspects: (1) creating space for relationship-building, (2) empathically containing fear-driven reactions to the polycrisis, (3) practising compassionate "hospice work" for

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decaying elements of the Holocene-based civilisation, and (4) celebrating and leaning into aliveness wherever it emerges.

Keywords: Anthropocene, trust, containment of fear, aliveness-centred transformation, systemic hospice

Introduction

During the last 10,000 years of the Holocene, humanity has evolved into a globally connected system, optimised for the stable ecological conditions of this era. With the emergence of the Anthropocene we are witnessing how the human-Earth system is beyond the meta-stable balance it maintained (Steffen et al., 2011). Climatic and various other environmental and social conditions of the human-Earth system are changing, posing significant risks and creating a situation often referred to as a polycrisis, a condition in which crises do not occur sequentially or independently but amplify and destabilise one another. Despite the information available, a striking "human gap" persists in three key dimensions: the cognitive (a lack of understanding of deep interconnections and long-term consequences), the emotional (an underdeveloped ability to constructively use emotions like fear and hope) and the action gap (a failure to implement knowledge into sustainable actions on personal, societal and political levels) (Botkin et al., 1979).

In response, humans, who assume that they humans must act to avoid specific risks in order to preserve currently favourable ("sustainable") living conditions, have taken various steps to address these crises. As "climate anxiety" and related fears have become widespread (Clayton, 2020) many of these approaches and processes of human collaboration and learning are driven and shaped by concerns and anxieties about undesirable futures.

While the adversarial effects of the Anthropocene are undeniable, I wonder: Why and how would it be possible for humans to lean into the emerging future with hope?

In the following sections, I will explore how the emergence of the Anthropocene can generally be interpreted from a hopeful perspective. More specifically I will reflect how change agents can cultivate and sustain hope in the face of current and future suffering. And I will describe which transformative practices guided by hope might be most relevant for collaboration and learning.

The need for hope in the polycrisis

In the face of the polycrisis, contemporary societies are increasingly confronted with a sense of urgency and overload, often leading to a sense of hopelessness and a decreased sense of agency. Two central drivers of this experience lie in a) how scientific knowledge relates to the future and b) how humans respond to complexity and overwhelm.

The polycrisis, scientific foresight and the experience of lost agency

Much of contemporary climate and Earth system science relies on model-based projections that are constrained by past observations and informed by scenario assumptions. These projections are indispensable for identifying trends, risks, thresholds and potential tipping points. At the same time, they are often interpreted (both within public discourse and institutional decision-making) as predictions of inevitable futures. In this translation process, their status as conditional, probabilistic scenarios is frequently lost, and they become mentally internalised as dominant images of what the future will be, rather than as explorations of what may unfold under specific conditions.

From the perspective of complexity science, this limitation is fundamental. Complex adaptive systems, such as the coupled human-Earth system, are characterised by non-linearity, feedback loops and emergent dynamics that cannot be fully anticipated from past behaviour. While models can illuminate tendencies and constraints, they cannot exhaustively represent the space of possible futures. When this epistemic limitation is overlooked, scientific projections can unintentionally contribute to a sense of futural closure, reinforcing the impression that meaningful agency is no longer possible.

This perceived loss of agency is further intensified by the institutional and organisational contexts in which many decisions are made. Political and economic institutions have largely been designed under assumptions about stability, controllability and linear cause-effect relations. As global dynamics become more volatile and interconnected, decision-makers often experience a growing mismatch between the complexity of the challenges they face and the tools available to address them. Concepts such as VUCA, resilience and ambiguity tolerance are widely invoked, yet organisational cultures frequently continue to demand clarity, predictability and rapid control.

Psychodynamic responses to overwhelm: fear, defence and hopelessness

Under such conditions, it is not uncommon to observe defensive responses. These include attempts to reassert control through increased regulation, micro-management or authoritarian decision-making, as well as forms of avoidance, delegation or strategic denial (Dörner, 1980, 1997). Psychodynamically, such responses can be understood as reactions to overwhelm rather than as deliberate choices. At the individual level, similar dynamics are reflected in phenomena such as climate anxiety, eco-distress and emotional numbing, which are now widely documented across different populations (Clayton, 2020).

Against this background, hope is sometimes invoked as a counterweight to fear or paralysis. However, if hope is introduced merely as encouragement or optimism, it risks remaining superficial and fragile. What I propose is a more fundamental examination of the assumptions that underpin widespread experiences of hopelessness in the face of the climate crisis.

From a psychodynamic perspective, much contemporary hopelessness can be understood as resting on three interrelated assumptions:

- First, hopelessness is often rooted in **futural determinism**: the implicit belief that projected negative developments will inevitably occur. When scenarios are internalised as certainties, rather than as conditional possibilities, agency collapses and action appears futile.
- Second, hopelessness is closely linked to **attachment-based fear**. Much resistance to change is driven by the anticipated loss of familiar ways of life, identities and sources of meaning. Denial, aggression or withdrawal can thus be understood as (often unconscious) attempts to protect what has been loved and relied upon.
- Third, hopelessness is reinforced by an **ontological pessimism towards emergence**. The unknown future is tacitly assumed to be more likely destructive than generative. Under this assumption, novelty appears primarily as threat and effort loses its meaning.

Taken together, these assumptions form an inner logic that helps explain widespread patterns of paralysis, polarisation and resignation. Importantly, this logic is internally consistent, even as it severely constrains the capacity to imagine alternative futures. The question, therefore, is not how to eliminate fear or grief, but whether a different orientation towards uncertainty and emergence becomes possible.

Hope as an alternative orientation towards uncertainty and emergence

At this point, it becomes necessary to clarify what hope means to me in our current context. In this article, hope is not understood as optimism, consolation, positive thinking or the belief that developments will turn out well. Nor is it a denial of risk, suffering or loss. Rather, hope is proposed here as a fundamentally different way of relating to the future.

- First, **hope transcends futural determinism**. It does not depend on forecasts or guarantees. Scientific knowledge can inform us about risks, tendencies and boundaries, but it cannot fully anticipate emergent dynamics in complex systems. Unpredictable risks are part of this as well as positive surprises. Hope therefore does not stand in opposition to scientific realism; it complements it by acknowledging the limits of extrapolation in a non-linear, self-organising world. The future remains open — not arbitrary, but not fully predetermined.
- Second, **hope moves beyond loss-avoidance**. It includes a sober acknowledgement that the climate and polycrisis will involve profound disruptions, suffering and irreversible changes. What distinguishes hope from despair is not the absence of grief but the refusal to reduce the future solely to the preservation of what already exists. Hope accepts that something will be lost, while remaining open to the possibility that what emerges may carry different forms of meaning, value and vitality.
- Third, **hope is grounded in an ontological repositioning of the human**. If the Earth system is understood as a self-organising, evolving whole, then humanity is not external to this process but an expression of it. From this angle, human agency unfolds within the dynamics of life rather than against them. The transformations currently manifesting as climate disruption are therefore not simply movements against life but movements within the ongoing differentiation, crisis and reorganisation of the living Earth system. Trusting emergence, in this sense, does not mean assuming benign outcomes. It means recognising that novelty is not exhausted by catastrophe and that participation, responsibility and meaning remain possible even when outcomes are uncertain.

In this understanding, hope is not the belief in a positive outcome, nor the illusion that the future can be controlled. Instead, it reflects the recognition that it matters how we participate in the unfolding future. Life itself is considered meaningful even under conditions of uncertainty. Václav Havel captured this insight when he wrote,

"Hope is not the conviction that something will turn out well, but the certainty that something makes sense regardless of how it turns out."

This sense of hope allows engagement without guarantees, responsibility without control and commitment without the promise of success because our actions — however small — participate in a larger, meaningful process. From such a stance, the polycrisis can be approached not only as a threat to be minimised but also as a transformative passage through which new forms of relationship, responsibility and collective maturity may emerge.

To summarise these points, I propose the following working definition of hope:

> *Hope is an orientation towards an uncertain future that neither relies on predictive certainty nor on the preservation of existing conditions, but affirms responsible participation in emergent processes and aliveness while perceiving meaning in the act of participation itself, regardless of specific outcomes.*

Mindfulness as a key element of hope

To approach the Anthropocene with this kind of hope is to say a profound "yes" to the reality we live in. It is an acceptance of life as something inherently meaningful, even in its most challenging moments. This may seem counterintuitive given the immense environmental and social crises we face. Yet looking at life through this lens shifts the narrative. Instead of interpreting human existence as a tragic error or a mistake of evolution (e.g. humans as "too stupid to treat the Earth more carefully"), we may come to recognise that humanity, with all its imperfections, is part of a larger, ongoing process of life. There is nothing fundamentally "wrong" with life itself, even as we confront unprecedented shifts and challenges. Humanity is not a detour from the natural order but an expression of life, its evolution and learning; it is deeply embedded within the intricate web of existence.

This perspective, which may be described as *mindfulness in the Anthropocene*, calls for a non-judgmental relationship with the reality we experience. It does not deny the challenges or the immense suffering that accompany the current crises; rather, it cultivates an awareness that life, in all its forms, continues to unfold. While we may not control the direction of this unfolding, we can choose how we relate to it. The invitation is therefore to approach life not primarily with fear, but with openness, to willingly sink into the complexity and uncertainty of the Anthropocene, rather than attempting to impose our limited understanding upon it.

The Holocene as womb, the Anthropocene as birth

At the heart of this hopeful perspective lies the recognition that the Holocene, the epoch that provided the stable environmental conditions for the rise of human civilisation, can be understood as a "womb" for the emergence of a new phase of human existence. The Anthropocene, with all its disruptions, is therefore not simply a sign of failure, but a necessary transition. Rather than marking the end of civilisation, it may be seen as a moment of transformation, an initiation into something new. Like the birth of a child, this process can be painful, chaotic and uncertain, but it also represents a movement towards new possibilities. The grief we feel over the loss of stability and familiarity is not to be dismissed; it is real and important. At the same time, this grief can coexist with the hope that something new, perhaps more alive, more complex and more interconnected, is emerging from the current crisis.

A critical aspect of this hope lies in recognising the patterns of aliveness that are present in every phase of life, including decay and death (Capra & Luisi, 2014; Kuenkel, 2019). Death is often equated with the absence of life, but in natural systems it is an intrinsic dimension of aliveness itself. Just as fertile soil depends on the decomposition of organic matter and obsolete urban infrastructures must be dismantled before new forms of urban life can develop, systems must decay and transform for new forms to emerge. Acknowledging death and decay in this way does not imply passivity or resignation; rather, it reflects a deeper understanding that they are not opposites of life but integral to life's ongoing, cyclical dynamics.

Embracing hope in the Anthropocene therefore involves a willingness to let go of illusions of control while remaining engaged and responsible. This does not mean abandoning agency but recognising the limits of human influence within larger self-organising processes. Trust, in this sense, is not placed in an external force that will save us but in the life-force itself — in the ongoing capacity of living systems to reorganise and unfold, even through difficult and unpredictable transformations.

From power-over to power-with

This form of hope requires a fundamental shift in how we perceive power. The current civilisation is predominantly rooted in a "power-over" mindset, in which control, separation and domination are understood as the primary sources of success. This mindset is deeply ingrained in our institutions, economies and ways of relating to the world. If we are to move into a new phase of human existence, grounded in hope rather than fear, we need to adopt a "power-with" or "power-to" paradigm (Pansardi & Bindi, 2021). This shift recognises that power becomes most effective

when exercised in relationship with others, both human and non-human. Power, in this sense, is not about manipulation but about agency, collaboration, mutual support and shared purpose. Thus, it is fundamentally based not on seeing the human being as separate from non-human life but seeing human and non-human life as fundamentally related and interwoven.

Humanity's emancipation and the planet becoming conscious of itself

The Anthropocene is often defined as a period in which humanity is exerting unprecedented power over the Earth, exploiting its resources and transforming its ecosystems. But rather than viewing the Anthropocene as a moment of human triumph and domination, I propose that it be understood as the next step in the emancipation of human consciousness. I see it as the planet, via humanity, becoming conscious of itself. The Anthropocene includes an expansion of awareness — a deepening of human consciousness as we confront the limits of our actions and recognise (or re-discover) our interconnectedness and changing role with the Earth and all its inhabitants.

We are not here simply to *protect* the system that has enabled our current civilisation; we are here to honour the journey that has brought us to this moment and to continue it with awareness and humility, possibly in fundamentally new forms. For thousands of years, the Earth has provided conditions that allowed humans to evolve into conscious, socially intelligent and culturally creative beings. Now, as these conditions change, humanity may be ready to leave the "womb" of stable planetary conditions.

Like all transformational processes (birth, puberty, mid-life crisis or the maturation of societies) this passage is unlikely to be easy or painless for humans or the Earth; indeed, it may be uncomfortable and even traumatic. It might also be precisely the step required for the next stage in the further evolution of conscious life on this planet. Just as an embryo must leave the safety of the womb to fulfil its life's purpose, so too humanity may need to undergo a transformation to become something more. And just as a newborn can find comfort and containment in the presence of parents or community, humanity may find new forms of support as it transitions into this new phase of existence. The question that pervades this shift is: *What is the larger story we are part of?* What is the container, the larger process, into which humanity is being born as it enters this new phase of becoming?

The mystery of aliveness and trust in the unknown

From my perspective, we have every reason to trust the emergent future of the complex human-Earth system. We are part of a journey that extends beyond our individual lives, cultures and even civilisations. As long as we are alive, we are invited to engage with the mystery of aliveness itself — the miracle of being alive in the midst of life. This is not something to fear or resist but to embrace and explore. One of the mysteries of our shared existence is that we, as individuals and as a species, are both expressions of life and reflective participants in its ongoing unfolding. We are part of a greater whole, a living process that transcends our individual lives. The story of conscious life on Earth is ongoing, and one day, each of us, individually and collectively, will pass away, making space for something new. This is not a tragic end, but a continuation of the journey of life — a story that has been unfolding for billions of years. A story that we may choose to be part of and continue, as consciously as we can.

An aliveness-centred transformative educational practice of hope

From an educational perspective, these reflections have profound implications for transformative processes. They invite a shift in focus from achieving predefined goals to cultivating sensitivity to aliveness as it unfolds. Instead of adhering to fixed targets, an aliveness-centred approach prioritises engaging with the dynamic qualities of the process itself, embracing fluidity, uncertainty and adaptation.

This approach is not merely about *understanding* concepts or skills but about learning to *experience* and *navigate* the emergent qualities of a process, aligning actions with aliveness. The central purpose of learning and action becomes relating insights, tools and skills to their role in nurturing or diminishing aliveness. The focus moves from predefined outcomes to fostering a deeper connection with the living processes that shape the world. While setting goals still provides direction, it is vital not to sacrifice the richness of the process in the rush to achieve them. This shift in perspective also reshapes how we approach teaching and collaboration. In transformative educational settings, the goal is not just to transmit knowledge but to guide learners in perceiving the life-force at play — recognising interconnectedness and aligning collective energy with a shared purpose.

Cultivating aliveness-centred sensitivity requires deep attentiveness to relational dynamics. It involves recognising that each moment in a learning or decision-making process carries its own energy and potential for emergence. Facilitators and change

agents must hold space for this emergence, creating conditions where the group can attune to the aliveness of the process itself. Individual change agents working in transformative educational settings must address aliveness simultaneously with respect to their mindset, skillset and toolset as follows:

- **Mindset:** Cultivate a personal state of mind that embodies trust and openness to the emergent qualities of aliveness.
- **Skillset:** Practise skills such as active listening, empathy and emotional intelligence to attune to the aliveness of others and the collective energy of a group or process.
- **Toolset:** Equip oneself with tools for facilitating aliveness-oriented dynamics and learning as well as methods for fostering creativity and innovation.

Principles for facilitators of transformational learning

A key aspect of enabling aliveness-centred transformational learning is creating "containers" that allow for both structure and flexibility. Such containers hold the intention of the group, while simultaneously providing the space for the unexpected to arise. It is not about rigidly controlling the process but about facilitating the conditions that allow people to experience their own aliveness within the process — whether through meaningful dialogue, collaborative creation or shared reflection. It requires the capacity to attune to the underlying currents of energy, emotion and creativity that drive any human endeavour and to steer the group towards these forces without attempting to manipulate or control them.

Among many potentially relevant aspects for designing and conducting such learning processes, I would like to highlight the following four principles:

1) Giving space and time for relationship-building first

Aliveness flows in systems of lively, dynamic relationships. In many contexts, however, participants in transformational learning processes initially experience distance or disconnection. It is therefore essential to first create space and time for the group to develop a healthy relational culture that supports mutual learning and co-creativity. An opening reflection that invites participants to connect with personal experiences related to the topic can help attune the group to the shared energy of the room and recognise collective aliveness. Rather than moving directly into a predefined agenda, the facilitator allows space for participants to explore their emotions, thoughts and aspirations in relation to the issue, honouring the emergent

nature of group dynamics.

Once this relational foundation is established, the facilitator can introduce tools, frameworks, or resources that support the group's orientation and action. Crucially, these tools are not applied in isolation but remain connected to the energy of the process. They thus become more than instruments for achieving targets; they are embedded within a larger living system in which the collective intelligence of the group is mobilised towards a shared purpose.

2) Empathically containing fear-driven reactions

In the face of the polycrisis, fear-driven reactions are almost inevitable. Climate anxiety, eco-grief and existential dread are increasingly common experiences and often intensify conflict while impeding constructive empowerment dynamics. In transformational learning processes, it is therefore essential to empathically contain these reactions by creating a space in which participants can express fear without being judged or silenced. This is not about fixing fear but about allowing it to be witnessed and held with compassion.

In my experience, a central task in facilitating transformational learning is to acknowledge that fear often arises when individuals confront the magnitude of the changes they are facing. This is particularly evident when working with decision-makers and leaders in the context of climate action, where the perceived stakes are exceptionally high. Facilitation in this context requires offering containment: a supportive environment in which participants can recognise and name fear and anxiety without shame and where these emotions are understood not as weaknesses but as natural responses to the complexity of the situation.

3) Practising compassionate "hospice work" for the decaying elements of the Holocene-based civilisation

Beyond the containment of anxiety and fear, a further element of an aliveness-centred educational practice lies in recognising that parts of the current civilisation are in decline. This is not a call to resist or deny the decline but to engage in what may be understood as compassionate "hospice work." Just as a hospice caregiver accompanies someone at the end of life, facilitators are invited to support the decaying elements of the Holocene-based civilisation by honouring what has come before and acknowledging that its time may be passing, while recognising the value of its legacy (De Oliveira, 2021).

This practice is particularly relevant in educational contexts, where learners and groups are often confronted with the grief of witnessing systems and structures that once appeared stable and enduring begin to falter. Facilitators can help guide participants through processes of anger, mourning and letting go, making visible that the dissolution of old forms is often a prerequisite for the emergence of new ones. Importantly, this also requires facilitators to remain in contact with their own impermanence and vulnerability. Embodying compassion towards oneself is frequently a crucial condition for offering this quality to others within transformational learning processes.

4) Celebrating and leaning into aliveness wherever it emerges

An essential component of this transformative educational practice is the capacity to celebrate and lean into aliveness wherever it emerges. This dimension of learning is often overlooked in conventional education systems, where success is typically measured by the achievement of predefined targets. In aliveness-centred learning, however, celebration is not a passive acknowledgement, but an active engagement with the dynamic energy that arises within groups, communities and individuals.

In my work as a facilitator, I have repeatedly observed groups tasked with complex problem-solving becoming trapped in intense debate over competing goals and priorities and in analysis. While such efforts are usually well intentioned, they often result in frustration, exhaustion and a growing disconnection from the deeper purpose of the work. When groups instead allow themselves to attune to the flow of aliveness — the dynamic and sometimes unpredictable energy that can arise through collective engagement — participants begin to engage more playfully with the challenge(s). This often releases a joyful creative energy and a renewed sense of connection with both the work and one another, giving rise to ideas that had previously seemed unimaginable. By celebrating the process of transformation itself rather than focusing exclusively on end goals, groups invite greater vitality, innovation and joy into their work — qualities that ultimately sustain transformative change.

By integrating these principles into educational or decision-oriented processes, we cultivate a learning culture that is not merely oriented towards achieving specific goals, but towards nurturing the living, relational processes from which transformation emerges. In this way, hope becomes an embodied practice — alive, dynamic and continually evolving. It guides us on a journey that carries meaning in itself, reconnecting us to the miracle of being life and being part of life.

This may sound simple, even obvious. Yet it seems to me to be among the most transformative practices of our time: learning to sense aliveness and be alive. Being alive in the deepest possible sense and to trust the futures that emerge as expressions of the aliveness we collectively practise as a globalised civilisation — beyond the limits of our imagination or science-based predictions. Embarking on such a journey of aliveness-centred transformational learning, I am convinced that there are truly no limits to hope.

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The study of intelligence in nature for an ecocentric perspective in education

Dana Aly López Solís[*]

Abstract

One of the greatest challenges of our time is establishing a new relationship with nature by adopting different knowledge, values, and attitudes. Currently, the anthropocentric worldview dominates social systems — from economics to education — and from this perspective nature and living beings are mere objects valued only for human benefit.

To move forward, we must recognise the intrinsic value of all life, from microbes to entire landscapes, by adopting an ecocentric worldview. We can learn from Indigenous cultures that view humans and the natural world as a single community guided by reciprocity, respect and devotion. In these traditions, nature is alive, intelligent and a teacher.

Simultaneously, scientific fields such as cognitive ecology, ethology and bioacoustics are providing compelling evidence that intelligence is an inherent characteristic of life. Furthermore, technologies like machine learning are now helping us decode non-human communication, a clear feature of intelligence.

These insights offer a transformative opportunity to create educational content that supports an ecocentric perspective, awakening wonder, compassion and critical thinking. This article explores the philosophical foundations of ecocentric education and its relationship with intelligence in nature — examining capacities such as animal culture, communication and memory. Ultimately, it advocates for a paradigm shift: moving away from a mechanistic view of life towards a holistic, ecological perspective

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where nature is no longer an object, but a subject and a mentor.

Ecocentric education for a new view of intelligence in nature

An anthropocentric worldview suggests that intelligence is a uniquely human trait, a worldview that establishes a hierarchy over all other beings. Nevertheless, this assumption is currently being re-evaluated by researchers in various fields who are uncovering complex forms of intelligence in non-human life.

We need an ecocentric approach in education that incorporates scientific discoveries about the diverse intelligence in nature. This approach could encourage a cultural evolution, through which nature is no longer considered the scenic backdrop for human life or a source of resources to be exploited.

Ecocentric education implies not only educating from a productive perspective but also understanding our place in the world and our responsibility (Orr, 2004); it requires taking as a starting point that we share the planet with other intelligences. Human beings are part of the natural world, not apart from it.

We have the opportunity to initiate a genuine cultural revolution by recognising the intrinsic value of the entire planet and all the beings that inhabit it, reconfiguring our relationship with them.

The study of intelligence in nature provides a comprehensive framework for enriching curricula at every level from early education to the university to informal education.

From an Anthropocentric to an ecocentric perspective of life

Our failure to perceive the intelligence in nature is related to our ignorance of the history and evolution of life on the planet. Microbes and plants, for example, have spent considerably more time on Earth than we have. Microbes have been present on Earth for approximately 3.7 billion years; meanwhile, plants appeared on land around 470 million years ago.

This vast history implies that they possess sophisticated skills that have allowed them to survive and thrive — a clear expression of intelligence.

The philosophical foundations of ecocentric education

The philosophical foundations of ecocentric education are rooted in deep ecology, kin-centric ecology and native science.

The philosophical argument of deep ecology, proposed by Arne Naess, emphasises that nature has intrinsic value, regardless of its utilitarian value to humans.

Likewise, Indigenous cultures provide essential contributions to ecocentric education, particularly through the foundations of native science and kin-centric ecology. The latter is a concept coined by Enrique Salmón to describe the Indigenous worldview in which all life forms are interconnected. For instance, humans are influenced by the plants, animals, lands and winds with which they coexist; simultaneously, human actions affect them in return. Ultimately, human life is only sustainable when this reciprocal relationship and the significance of these mutual roles are recognised (Salmón, 2000).

Another philosophical foundation is Native science. As Gregory Cajete (2000) describes, this form of science considers that knowledge occurs in relationship with nature, highlighting that what we learn is inseparable from the environment. Cajete emphasises that Western science searches for the "what" of things, while Native science searches for the "who." This perspective is relational because it recognises non-human persons, including animals, plants and even clouds or rocks.

Finally, ecocentric education is based on the relationship with place. As the Syilx (Okanagan) author and activist Jeannette Armstrong explains, this implies that an individual is integrated into a specific location and establishes relationships of reciprocity.

What is intelligence?

The conventional concept of intelligence is closely tied to rationality, with the existence of a brain often considered a prerequisite. However, scientific research has demonstrated that this is not strictly true; intelligence has been recognised in unicellular organisms, such as bacteria, and in plants, neither of which possess a brain.

On the other hand, we might consider the case of the octopus, which does not rely on a single brain alone. Instead, it possesses a nine-brain system: one central brain and eight mini satellite brains located at the base of each arm.

Similarly, the vegetal world is by no means passive. For example, research

indicates that plants generate electrical signals to organise growth, movement and defence using neurotransmitters typically associated with the animal brain, such as dopamine, serotonin and other chemicals (Mancuso & Viola, 2015).

Furthermore, brain size does not have a direct relationship with the number of neurons or their interconnections. A clear example is the bee: despite having a small brain, bees are cognitively complex beings capable of representing abstract concepts due to their sophisticated neuronal systems. In the case of birds, although their brains are small, their neural density and connections are similar to those of primates (Ackerman, 2017).

Emmanuelle Pouydebat defines intelligence as an individual's capacity for behavioural adaptation to a given situation; in other words, the ability to respond flexibly to novel or complex circumstances (Pouydebat, 2018).

A broader definition of intelligence is the ability to process information from the environment and generate a response to remain alive (Maturana & Varela, 1980). In these terms, intelligence is related to the capacity to memorise, teach and learn; to develop creativity; and to defend, cooperate, anticipate, feel and imagine.

Scientific research into intelligence in nature

Science is undergoing a paradigm shift from a mechanistic to a holistic worldview. This transition implies a reduction in prejudice regarding the study of intelligence and sentience in non-human life forms. It encompasses diverse fields of knowledge, including neuroscience, anthropology, ethology, philosophy, botany, psychology and microbiology.

In 2024, the University of St Andrews in Scotland established the Global Research Centre for Diverse Intelligence. This centre brings together experts in biology, psychology and philosophy to understand intelligence as a phenomenon that extends far beyond humans. They study how intelligence is expressed in animals, plants and even collective systems and consider answering this question to be one of the great challenges of our time.

At this centre, more than 80 researchers conduct studies on diverse intelligence, including human, non-human and machine intelligence. To understand how intelligence manifests is to explore the profound complexity of life, acknowledging the singular value of each individual and every species.

Intelligence is not restricted to a specific morphology or physiology. In the words of Stefano Mancuso (2011): "Intelligence is a property of life." From microbes

and plants to birds, insects, molluscs and mammals, all organisms interact with their environment, collect and process information and consequently make decisions.

Manifestations of intelligence in nature

Planetary intelligence

The Gaia Hypothesis revolutionised the perception of Earth, which had been seen as a passive mass of rock. Developed by James Lovelock and Lynn Margulis, this theory describes the planet as a dynamic, self-regulating system in which interactions between biological organisms, the oceans, the atmosphere and the lithosphere create the optimal conditions for life to flourish. By actively modulating its own salinity, oxygen levels, temperature and atmospheric composition, the Earth exhibits what can be described as a planetary manifestation of intelligence. Consequently, to comprehend the Earth as a unified organism, we must recognise the essential contributions of every component, from microbial life to the polar ice caps.

Recently, a group of astrophysicists proposed the concept of planetary intelligence, which they defined as "the acquisition and application of collective knowledge, operating at a planetary scale, which is integrated into the function of coupled planetary systems" (Frank et al., 2022). Understanding the mechanisms of planetary intelligence serves as the foundational premise for developing an ecocentric perspective that recognises intelligence across all biological scales.

Collective intelligence

Intelligence is both an individual quality and a collective phenomenon. This is evident in species such as fish, birds, bees and ants, all of which process information and engage in collective decision-making. For instance, honeybees select a new hive through a consensus-building process; individual scouts communicate the direction and distance of potential sites through the "waggle dance." The final choice emerges from a mechanism similar to voting, in which the decision is solidified as more bees recruit others to the same location (Seeley, 2010).

Landscapes can also be understood as expressions of collective intelligence. They are the result of inextricable and continuous relationships between the animate and the inanimate — comprising mountains, rivers, forests and organisms ranging from microbes to humans.

In this sense, the concept of landscape shifts from being a mere collection of ecosystemic elements to a dynamic representation of collective intelligence, in

which life, matter and energy continually transform one another. This perspective aligns with Indigenous traditions that view plants, animals and geographical features as relatives or teachers. This ancestral wisdom is scientifically validated through biomimetics, a field that treats nature as a mentor, measure and model (Benyus, 1997).

Abilities related to intelligence

Ability to learn and memorise

One of the most extraordinary examples of a good memory is a bird's: Clark's nutcracker. It collects up to 100,000 seeds per year, caching them across 25,000 sites within a 14-mile radius. Studies have found that this bird can memorise these locations by using visual landmarks and spatial memory. Through this behaviour, Clark's nutcracker guarantees not only its own survival but also that of the forest, as the seeds it does not consume eventually grow into trees (Whitebark Pine Ecosystem Foundation).

Social learning and problem-solving

Lars Chittka and a group of scientists (2023) from Queen Mary University of London have demonstrated through experiments that bumblebees can solve complex problems and share their knowledge with others. This study is considered a breakthrough, proving that even invertebrates possess cumulative culture — the ability to pass on increasingly sophisticated behaviours through generations.

Ability to experience emotions

The notion that animals do not experience emotions is a common misconception. While fear is often the most evident emotion, it is by no means the only one; animals also experience love, compassion, sadness, boredom and friendship.

For example, octopuses can demonstrate explicit acceptance or rejection of specific caregivers. Being highly curious creatures, they require constant stimulation in captivity to avoid boredom (Montgomery, 2018). Furthermore, they exhibit an extraordinary ability to use camouflage, imitating the colours and textures of their environment across their entire body. This complex behaviour suggests not only a sensory response but also a sophisticated level of environmental awareness.

The capacity to feel emotions also encompasses grief following the death of a family member or social companion, a phenomenon clearly observed in elephants, whales and apes.

Dreams as a manifestation of consciousness and intelligence

Scientific research has established that dreaming is a common phenomenon among vertebrates. This indicates that they experience various sleep phases, including vivid dreams. Clear examples of this occur when dogs move their legs or exhibit spasms during sleep. Octopuses have even been observed changing their shape and colour while asleep, suggesting a response to internal stimuli.

The capacity to dream is one of the most remarkable abilities in the animal kingdom. Science has documented it in species as diverse as horses, bees, birds, dogs and octopuses. Such evidence demonstrates that animals possess complex minds and a rich inner life.

In 2000, biologists Dave and Margoliash discovered that Australian zebra finches exhibit the same neuronal activity whether they are singing in a waking state or dreaming during sleep. This high level of neuronal activity involves the entire body, rather than being restricted to the throat. These findings imply that birds reinforce their learning through dreams, suggesting a profound internal life (Peña-Guzmán, 2023).

Abilities to use tools and to construct

The use of tools is a capability shared between humans and other animals, including insects, cephalopods, fish, birds and primates. These behaviours are employed for various purposes, such as grooming, acquiring food or water, defence and communication.

Primates and birds, particularly bonobos and crows, demonstrate remarkable creativity in their application of tools. Furthermore, recent scientific research has found that Labridae fish utilise a technique known as "anvil use," in which they employ a hard surface to crack open hard-shelled prey (Tariel-Adam et al., 2025).

In addition to tool use, many animals build extraordinary structures, such as termite mounds or beehives. Termite mounds are engineered to regulate internal temperature through complex ventilation systems. Similarly, in beehives, bees utilise hexagons for storing honey because they are the most mathematically efficient structures; this geometry allows them to store the maximum volume of honey using the minimum amount of wax (Hales, 2001).

Vegetal intelligence

Plants are organisms that could radically transform our understanding of what it means to be intelligent. The dominant idea is that a brain is necessary for processing information and making decisions. However, plants demonstrate that this is not strictly true; although they lack a centralised brain, they perform similar functions throughout their bodies.

Bioacoustics — the study of the sounds of the natural world — has revealed that plants emit sounds that vary according to their health. These experiments provide a unique opportunity to listen to plant vibrations and the electrical signals of fungi, uncovering a hidden communication network within the ecosystem. Furthermore, the root apex exhibits electrical activity similar to that of the animal brain; roots perform complex tasks, such as detecting water flow and identifying obstacles in their path.

Underground, there exists a network composed of tree roots and fungal hyphae known as the "wood wide web." This network is a brilliant example of cooperation that sustains life, allowing trees to thrive through the mutual exchange of nutrients, water, carbon and vital information.

Flowers also exhibit intelligent behaviour; they attract pollinators through their forms, colours and nectar with the clear purpose of guaranteeing pollination. Plants can also remember and learn, for example, they track where the sun rises and recognise the presence of a predator or pollinator. Finally, time-lapse recording allows us to appreciate how plants direct their growth, revealing their behaviour, movement and decision-making processes in response to environmental stimuli.

Communication

Forms of communication are diverse; they occur through chemical signals and movements, not only through sound. Crucially, communication always implies intention (Bouninconti, 2022).

Currently, there is an ambitious initiative to translate the language of sperm whales using artificial intelligence. The project Cetacean Translation Initiative (CETI) utilises AI to decode "codas," which are rhythmic patterns of clicks that whales use to identify their clans. This research demonstrates that they possess distinct dialects and a complex culture. The project employs technology to help us recognise these animals as a "who" instead of a "what" (Gruber, 2025).

Dolphins also possess various dialects that result from cultural transmission. Their sophisticated ability to communicate even allows them to use individual signature

whistles, effectively functioning as names to address one another. Similarly, insects can communicate through a wide range of chemical signals, sounds, or vibrations, organising complex social structures through these exchanges.

Social communities and animal cultures

Animal cultures are a clear manifestation of intelligence. Different groups of animals share knowledge among their members that is vital for survival. In this sense, animal culture is rooted in social learning regarding foraging techniques, fear responses, vocalisations, social behaviours, mate choice and nesting sites.

Living in groups provides a significant evolutionary advantage. In nature, many species live in societies in which social learning is essential. Mothers, in particular, often transmit critical skills to their offspring, such as locating food, seeking shelter or identifying and escaping predators.

Orcas, for instance, maintain highly complex social structures, with distinct hunting techniques passed down through generations. Similarly, migratory routes are culturally transmitted within societies of birds and mammals, including elephants, bats and whales. This cultural inheritance ensures that vital knowledge is preserved and adapted over time, reflecting a high degree of collective intelligence.

The culture of elephants

Elephants form societies based on rank and age because their survival depends on accumulated knowledge and experience. They must remember where to find water and food at different times throughout the year, often across vast distances.

The herd is protected and guided by the matriarch, the oldest female. Studies show that if she is over 35 years old, the probability of survival for all group members increases significantly due to her extensive experience. Furthermore, as a manifestation of their culture, each elephant herd develops its own distinct vocal dialect, recognising and communicating with one another through complex social cues.

The culture of fish

Fish are frequently undervalued animals; few people recognise the depth of their intelligence. Beyond their aesthetic beauty, they possess numerous abilities related to memory and learning. They effectively spend much of their lives in "school" — not merely in the collective sense but in a learning capacity. They learn about the structure of the shoal, remember their social status, and develop the ability to recognise their kin and familiar individuals (Brown, cited in Meredith, 2020).

Social learning is also central to their migratory routes. Furthermore, fish engage in collective decision-making within the shoal; this implies that each individual acts as part of a cohesive whole, performing a specific function while relying on others to fulfil their respective roles (Ward, cited in Meredith, 2020).

Pedagogies and curriculum content for ecocentric education

To bring these ideas into the classroom, we must rethink our teaching methods. Implementing new pedagogies requires moving beyond traditional instruction towards an education that is experiential and place-based.

- **Place-based learning:** Ecological education must take place outdoors to connect with the landscape and its ecosystems. The study of local rivers, mountains, soil and biodiversity forms the basis for understanding the systemic intelligence of the Earth.
- **Kinship pedagogy:** We need a pedagogy that moves away from the idea of the human as a rational observer and nature as a passive object of study. This requires a pedagogy based on relation, recognising our deep connection with all living forms as our relatives.

Example: Integrating specific Indigenous worldviews into history or geography. For instance, the Andean *Apus* are not considered geological objects but living spirits and "grandfathers" who protect and teach the community. This relationship is based on *Ayni*, or sacred reciprocity, in which the mountain provides life, and humans offer respect and care in return.

- **Project-based learning:** Through this methodology, students can research different expressions of intelligence in nature, highlighting interrelations rather than isolated parts. By sharing their findings, they become active participants in this new ecological understanding.

At the same time, the educational curriculum must be reoriented to integrate scientific research regarding intelligence in nature:

- **Planetary intelligence:** The starting point is to adopt the concept of planetary intelligence, which implies studying the interconnections within nature. This emphasises living forms and the relationships between them and the ecosystems they inhabit.

- **Biomimetics:** The curriculum can incorporate biomimetic lessons on how nature has developed solutions for movement, structure, colour, thermal regulation and vision.
- **Arts:** The curriculum could include the appreciation of the beauty of the natural world. This encompasses landscapes and biological patterns — such as fractals, spirals and ramifications — as well as the artistic expressions of other species, including songs, dances and the complex construction of shelters.

Implications of the study of intelligence for ecocentric education

This article has presented only a few examples of the manifestations of intelligence in nature. We are just beginning to understand the vast knowledge that the natural world holds.

Wonder, curiosity and imagination

We cannot improve the state of the planet without establishing a deep connection with its extraordinary beings and the beauty of the mountains, rivers, oceans, forests and skies. Learning from how these manifestations represent a sense of wonder can awaken our curiosity and provide a foundation to stimulate our imagination. As Yong (2023) suggests: "When we look at other animals, our world expands and deepens."

A sense of community

An ecocentric perspective of life implies a broader concept of community, comprised not only of human beings but also of other life forms and the energy and matter of the Earth. The study of intelligence in nature entails recognising that we have much in common with other species. Consequently, we can move beyond our superiority complex, acknowledging that we share a common ancestor — the first multicelled organism from which all life evolved.

From competition to cooperation

The dominant educational system often promotes an individualistic attitude and emphasises competition over cooperation. However, intelligence in nature teaches us that cooperation is a constant dynamic between species. There are countless examples of mutualism and co-evolution that demonstrate how life thrives through partnership rather than conflict.

Connection with nature and relationships of reciprocity

The study of intelligence in nature is fundamental to reconnecting with the natural world; it allows us to be more open-minded and to appreciate the beauty of the evolutionary process. Consequently, we can cultivate relationships grounded in an ethical consciousness regarding our impact — whether restorative or detrimental — on the entire terrestrial system.

Decolonising education

Decolonising education is a vital component of an ecological perspective. It involves developing a different worldview of nature rooted in Indigenous knowledge. In this manner, we can shift towards a more egalitarian and reciprocal relationship with the Earth. Following this path, we must indigenise education to adopt new ways of knowing, doing and being — all based on respect and reverence for nature.

Barriers to adopting an ecocentric educational perspective

Despite the evidence, several obstacles hinder the integration of these concepts into mainstream education:

- Anthropomorphism: Conventional science often claims that attributing complex conduct or knowledge to plants and animals is merely "anthropomorphising "them. This bias represents a major barrier to studying intelligence in nature within an ecocentric framework, as it dismisses non-human agency as a mere projection of human traits.
- The hegemony of Western science: The dominant Western paradigm often asserts itself as the only valid method for generating knowledge, leaving little room for Indigenous or Native science. Consequently, ancestral wisdom — which has recognised the intelligence of the natural world for millennia — is often excluded from the scientific and educational conversation.
- Curricular rigidity: A significant practical barrier is the limited capacity of educational systems to integrate new scientific discoveries into existing curricula. The bureaucratic nature of education means that the gap between cutting-edge research into diverse intelligence and what is taught in the classroom can remain open for decades.

Conclusions

The study of intelligence in nature within the context of education leads us to understand the fundamental importance of the planet's genetic diversity, as well as the diversity of intelligence itself. In this framework, human intelligence is recognised as simply one among many kinds, rather than the singular standard.

In this article, we have explored non-human intelligence. Other species possess abilities comparable to our own: they learn, memorise, communicate, experience emotions, dream, use tools, create structures and develop complex cultures.

Nature is alive; it is a source of infinite knowledge and inspiration. We are beginning to dismantle the dominant misconception that nature is inert or that animals are merely machines or objects rather than subjects with their own agency.

We are witnessing a profound paradigm shift towards a systemic and holistic understanding of nature and all its life forms. Consequently, education must integrate these emerging scientific insights with the ancestral wisdom of Indigenous cultures to foster a future grounded in reciprocity and respect.

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Biographies

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Past hopes for desirable societies: a focus on human needs

Jesús Martín González[*]

Abstract

The 1970s were characterised by numerous constructive and hopeful initiatives that did not reach their full potential after the economic shift to neoliberalism in the 1980s. Among many, one from the Global South, Fundación Bariloche (Argentina), challenged the Northern proposal, *The Limits to Growth*, the first report to the Club of Rome authored by a group of Massachusetts Institute of Technology researchers, with a mathematical computer model. Fundación Bariloche published their book *Catastrophe or New Society?: A Latin American world model* in 1976**.** Its normative model was grounded in ethical and political perspectives, emphasising basic needs and citizen participation. The normative proposal of this article involves reencountering a holistic model of nine human needs, developed by Carlos Mallmann, president of the Bariloche Foundation, as a possible frame for the Latin American World Model. Mallmann also participated in the report *No Limits to Learning*, in which he indirectly addresses how studying unmet human needs can contribute to understanding them.

This focus on needs presents a hopeful framework across four dimensions (vital, solidaristic, responsible and conscious hands) that serve as a compass/map at both micro and macro levels for a planet under human stewardship. A proposed formula guides this framework, according to which the "vital hand," representing human beings on the planet, depends on the effective management of the other three hands. A key element of this formula is "synergy," a concept that anthropologist Ruth

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Benedict adapted to the social sciences and Mallmann proposed as a human need. Examples of synergistic efforts provided from each of these four perspectives can help us learn how to build more synergetic societies.

Keywords: needs, synergy, vital hand, solidarity hand, responsible hand, conscious hand.

"Fear puts up warning signs. Hope, by contrast, sets up signposts and pathmarks. Only when there is hope can we be on our way. Hope provides meaning and orientation. Fear, by contrast, stops us in our tracks."

— Byung-Chul Han (*The Spirit of Hope*)

"My hope is necessary, but it is not enough. Alone, it does not win. But without it, my struggle will be weak and wobbly. We need critical hope the way a fish needs unpolluted water."

— Paulo Freire (*Pedagogy of Hope*)

"Without trust, a man lives, but not a human life; without hope, he dies."

— Ursula K. Le Guin (*City of Illusions*)

In the 1970s, the Club of Rome supported two major research projects which resulted in the reports: *The Limits to Growth* (Meadows et al., 1972) and *No Limits to Learning* (Botkin et al., 1979). They also backed the work of the Bariloche Foundation (Argentina), which later gained recognition with the publication of the book *Catastrophe or New Society?: A Latin American world model* (1976).

What is the history of the Bariloche Foundation? How does it connect with *The Limits to Growth and No Limits to Learning?* How does my research link both issues with this new report? These are the three questions that will be answered in this article. An article that will end with hopeful signposts and landmarks that are metaphorically already cleansing the polluted waters of the system we live in. Without them and their hopes, the human species would probably already be extinct.

Fundation Bariloche, a southern educational utopia

The history of the Bariloche Foundation goes back to the 1960s. Bariloche, Argentina, was home to the Bariloche Atomic Centre — and therefore to a large community of scientists as well. In March 1963, the Bariloche Foundation was created as a non-profit organisation — the first president of the Board of Trustees being the physicist Carlos Mallmann, who would continue to play a decisive role as manager

and as an alum into the 1980s.

The foundation aimed to establish a university dedicated to research across the sciences, encompassing the hard sciences, the social sciences and the arts. It was an interdisciplinary centre that dreamed of being a "university of utopia."

In those early years, this hopeful project was well underway. They had prepared a project; the municipality had provided land; and funding was secured from various groups. However, other events also played into the development. Among them, a financial crisis of one of the companies of a major financier combined with a coup d'état in Argentina (1966) cut short those dreams. There was a brain drain, and the Bariloche Foundation, which had envisioned this utopian university, evolved into a think tank, preserving the interdisciplinary nature of its departments.

In 1971, a team from the Massachusetts Institute of Technology (MIT) presented the results of their project to the Latin American scientific community in Rio de Janeiro. Their message was that their model, World3, showed that if we continued on business as usual path, that the planet would face numerous environmental and resource problems in the near future, with social impacts on the population. Among the Latin American scientists, there was a representative from the Bariloche Foundation. They accepted the possibility of environmental collapse in the future; however, they questioned the present status quo. Their message was clear: in the high-income countries in the so called 'Global North', where people generally live well, they worry about what might happen in 50 years; in the Global South, however, environmental degradation is already happening among its populations, largely due to colonialism and power imbalances.

While the book *The Limits to Growth* was being written, the Bariloche Foundation team began designing a mathematical model using a different methodology and indicators to those of MIT. While the World3 model was mainly an extrapolative model, the Latin American World model was mainly normative. The former modelled impacts based on present and past data, while the latter aimed to achieve a desired future. Thus, the authors of the book *Catastrophe or New Society?* stated in their introduction:

"[The model] is not an attempt to discover what will happen if present trends continue but tries to indicate a way of reaching a final goal of a world liberated from underdevelopment and misery. It does not pretend to be "objective" in the sense of being value-free as generally understood. It portrays a conception of the world shared by its authors and to which they are deeply committed. On the other hand, it is objective in that it starts from a distilled but realistic view of the problems facing the

world and seeks solutions based on the capacity for change and creativity that human societies have demonstrated so often in the past."

In a 2016 review (40 years later), four fundamental assumptions were identified as the minimum which were desirable and achievable, considering the capacities available in the 1970s.

- "A socially egalitarian society can be founded on the satisfaction of the inalienable rights of all individuals, including the right to food, housing, health and education. The model took these rights to constitute the definition of the basic needs of humanity, as an initial building block."
- "Multiple aspirations and needs were recognised, which differ qualitatively from the basic needs outlined. The model explicitly excluded these aspirations and needs and concentrated solely on basic needs."
- "Each individual can actively participate in decision-making."
- "The society proposed in the model is non-consumerist, in the sense that it considers that consumption is not a value in itself, but only a means to satisfy basic needs."

With the arrival of the 1980s and the rise to power of neoliberalism through Thatcher and Reagan, the Overton window shifted towards ideas and policies that emphasised individuality rather than collectivity, favouring more competition than cooperation. In 1979, the report *No Limits to Learning* was published. It was the first report to the Club of Rome written by authors from socialist and low-income countries as well as from the West. Among them was Mallmann, creator of a human-needs model.

Carlos Mallmann: a holistic framework of needs towards synergy

In *No Limits to Learning*, Mallmann wrote a paragraph that perfectly frames both the ethos that permeated the Bariloche Foundation's *Catastrophe or New Society?* and the holistic needs framework he designed in the early 1970s.

"Some of the most crucial global issues in which learning was a particularly significant factor were identified and discussed. These included rural poverty, food and nutrition, the arms race, illiteracy, urban over-concentration, energy, communication — particularly the impact of the "telectronics revolution" — and the various effects deriving from the misuse of political power. The stress was put on

alternative perspectives of the world *problematique*. The participants felt that the report should stress learning for the eradication of poverty — not only material poverty but also the poverties of understanding, of security and protection, of love and compassion, of autonomy and anticipation, of meaning and spiritual justice and of equity."

Following the 1971 meeting in Rio de Janeiro, Mallmann began to formulate a holistic framework for human needs. In 1973, at a conference in Mexico, he presented his paper titled "On the satisfaction of human aspirations as the development objective," which gave rise to his definition of what it was to be human (Figure 1- see p. 554).

To understand this graph and Mallmann's research on human needs, consider the following summary, along with its insights and the context in which it is situated.

Humanistic philosopher Erich Fromm was one of Mallmann's most significant influences. The metaphors of "love" and "health" that Fromm used are also reflected in Mallmann's work. Thus, Mallmann's definition of need is grounded in the metaphor of "health."

"Need: the generic requirement that all human beings have in order not to be ill, by the mere fact of being members of the human species."

The counterbalancing element of needs is the satisfiers. Mallmann believed that needs were few and possibly universal; he found a balanced system of nine that encompassed the spectrum of human activities. On the other hand, the satisfiers are numerous and particular. This particularity is reflected in the diversity of cultures around the World, as well as in the diversity of local environments within collectives that are often considered more homogeneous, such as nations or countries.

Starting from the two elements of needs and satisfiers, he tried to develop his theory of wellbeing. He suggested it would take at least 50 or 100 years to obtain it and would require interdisciplinary teams.

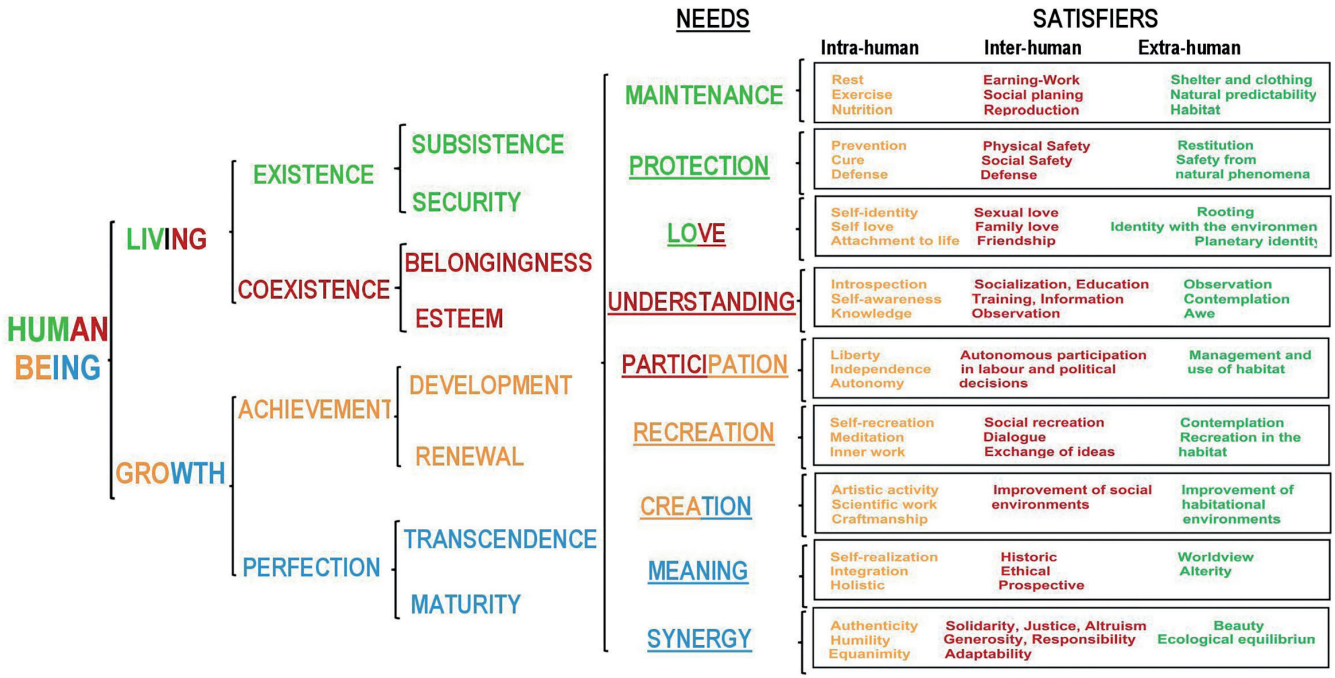


Figure 1: Human being: need and satisfiers. Translated and coloured by the author from the Spanish version by Mallmann (1973)

Mallmann was also inspired by psychologist Abraham Maslow. The latter did not create the pyramid of needs; it was the management industry in the 1960s. The point here is that one can visually see how a vertical (Maslow) or horizontal (Mallmann) view creates a particular path dependency in its structure. Thus, the vertical shape suggests that, to satisfy higher human needs, lower needs must be satisfied first. On the other hand, needs in horizontal form seem to indicate that, in a particular context, one can try to satisfy the need that applies to that same context.

Mallmann highlighted two key traits of human needs: they are "insatiable" and "relative."

- Insatiable: This is based on the observation that when human beings succeed in satisfying some of their needs, they replace them with others and struggle to satisfy them, and when they succeed, they begin a similar process and continue in this way until infinity (or death).
- Relative: Beyond the specific (absolute minimum) vital values, needs are relative or comparative; consequently, satisfaction, in the same way as perception, is always relative to a point of observation — the individual — and to reference groups — the collectives one is part of. The absolute minimum vital values are, of course, those necessary for an individual to have the physical and mental vigour to be able to perceive differences concerning reference groups.

Another metaphor that Mallmann used is that of "wealth" and its complement "poverty," as expressed in *No Limits to Learn*. In this way, he aims to highlight these deficiencies in our needs. Any system that does not try to alleviate these deficiencies, i.e. poverty of existence, poverty of protection, poverty of love, poverty of understanding and so on…, is mal-developed. The opposite is a system that addresses these deficiencies, ensuring they do not occur, and we can call it a well-developed system.

Finally, a visual representation of needs in a circle (Figure 2 - see p. 556), which I redrew from Mallmann's needs, suggests a more holistic approach from which my needs-based wellbeing theory and practice emerge. I will explain this further below.

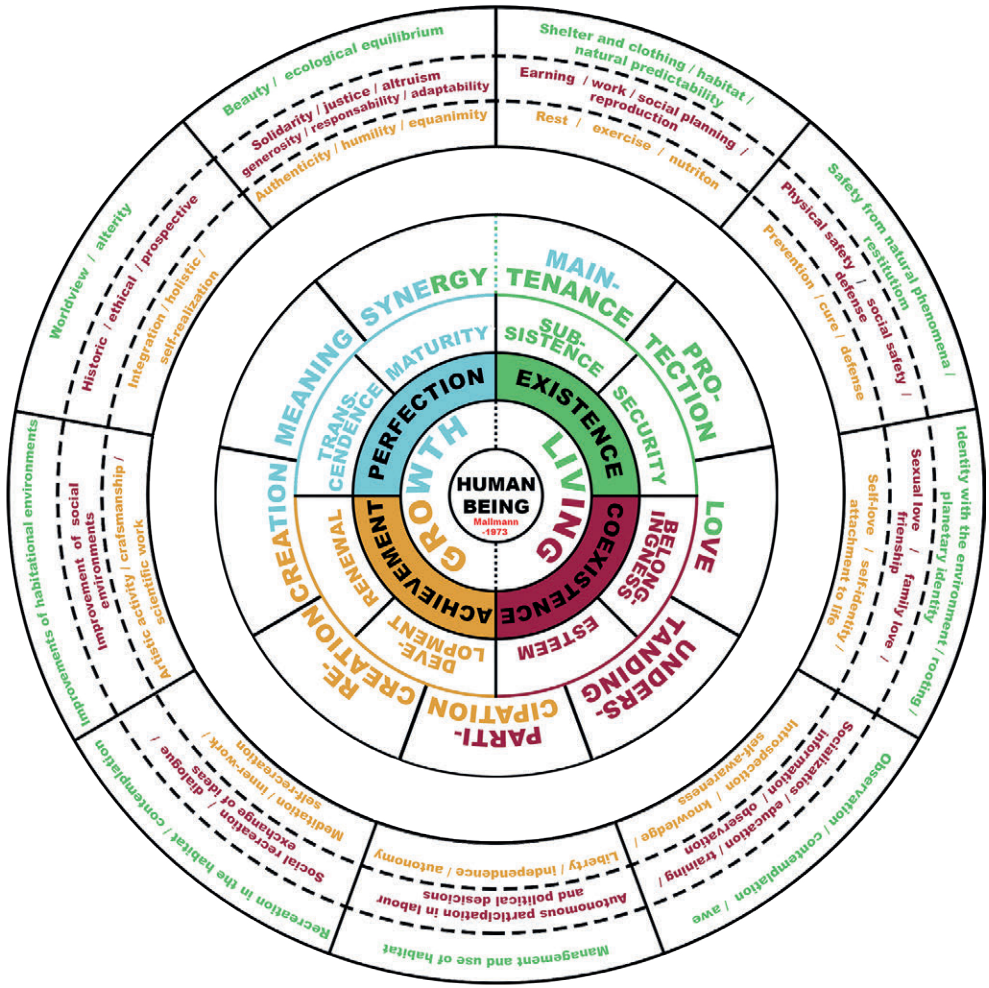


Figure 2: Human being: needs and satisfiers. Elaborated by the author through the work of Mallmann (1973)

A map/compass for a hopeful (well)-development in the next 50 years and beyond

In 2012, I developed a framework for sustainability and wellbeing during my master's thesis. It could be a map, a compass or both. It also had the spirit of *Catastrophe or New Society?*, i.e. a normative model aimed at a desirable future. In it, I identified 16 frames or strategies to be addressed through four major areas. Today, these four areas

are framed within the four hands (vital, solidaristic, responsible and conscious) of my new framework. It coincides with a human bio-psycho-socio-cultural framework from anthropology. All are interrelated, and if we analyse them separately, we must reintegrate them again.

In 2017, after five years in my role as an anthropologist analysing concepts; frameworks; political, economic, community, ecological movements... I returned to investigate Mallmann's work. This new immersion in his work — I stand on his shoulders — brings us closer to the theory of wellbeing that he predicted could take between 50 and 100 years.

This theory draws not only on Mallmann's work but also on the synthesis and integration of many ideas, frameworks and practices I have observed as an anthropologist since 2010. Mallmann's figure and vision of needs, which I reinterpreted in a circular form in 2023, provide the foundation for this theory.

When I observe the nine needs in a cyclical, clockwise order, I can imagine the birth of two babies: one in an Indigenous village untouched by modern civilisation and one born in a modern Western environment. In that particular comparison, one can see not only significant cultural nuances (satisfiers) but also the functioning, development or underdevelopment of the nine needs. It is not only at the level of the growing child but also through the surrounding culture.

This comparative and analytical exercise could be biased. It tends to idealise all Indigenous cultures while portraying modern civilisation as the opposite and as more destructive. Let us consider these nuances as an exercise in "schismogenesis" (literally, the creation of division), a term coined by anthropologist Gregory Bateson. In the book, *The Dawn of Everything*, anthropologist David Graeber and archaeologist David Wengrow suggest that schismogenesis describes differences between societies, as groups define themselves against their neighbours.

My analysis aims to highlight the differences in the processes of satisfaction between a "tribal era" preceding the rise of civilisation and an "imperial era," which emerges after the development of agriculture.

A new era has emerged in our modern times: the "planetary era," which encompasses both eras but is now driven by the values of this last imperial era. We find ourselves in what is probably the final stage, a Western modernity marked by neoliberal values with little room for Indigenous values. Where I say "values," one could also use Mallmann's term "satisfiers." The utopian idea is: this planetary era should move away from imperial values or satisfiers and move towards tribal, synergistic values and satisfiers, i.e. an adaptation from our past tribal era to our

present planetary era.

In addition to the schismogenesis concept, I want to add to this analysis the concept of "social synergy," which anthropologist Ruth Benedict adapted to the social sciences. She found that this synergy could be low or high depending on the cultures analysed. Thus, cultures with low synergy were correlated with aggression, and those with high synergy were correlated with more peaceful conflict resolution and personal fulfilment. The latter was biased towards a life-affirming approach, whereas the former was biased towards a life-denying one.

In the previous paragraphs, we observed an intriguing chain of anthropological relationships. Mallmann was likely influenced by Maslow's concept of "synergy." Benedict had been both Maslow's mentor and friend, and he was captivated by her idea of "synergy." Ultimately, Maslow's theory of needs could have taken some inspiration from his fieldwork among the Blackfoot, who were drawing a teepee that extended towards the sky. Unlike in Maslow's theory, "self-actualisation" was positioned at the base of the Blackfoot teepee and formed the foundation of "community actualisation," with the apex of the teepee aimed at "cultural perpetuity."

Let's start with the schismogenesis exercise of both babies.

The vital hand (needs: maintenance, protection and love).

Both babies in normal families receive satisfaction of all three needs. The only difference is that the need for love may be somewhat neglected in the case of the Western baby because of cultural factors inherited from the needs of the conscious hand (creation, meaning, synergy). The conscious hand from the previous cycle connects with the vital hand of this new cycle. The potential lack depends on whether the baby is born into a more or less synergistic culture.

Comparing the two cultures, we observe that in these complex modern societies, paid work occupies a considerable portion of caregivers' time, particularly when they are employed and lack a significant caregiving break. Psychologist Darcia Narvaez has examined this through the concept of the "evolved nest," highlighting the differences between complex modern parenting culture and Indigenous practices. What she has observed is that our complex modern culture tends to be more neglectful about providing vital care to their children compared to Indigenous cultures. I would argue that inherited low cultural synergy in complex modern times accumulates and impacts parental harmony with respect to the baby, creating a kind of vicious circle that sustains itself until a possible break occurs.

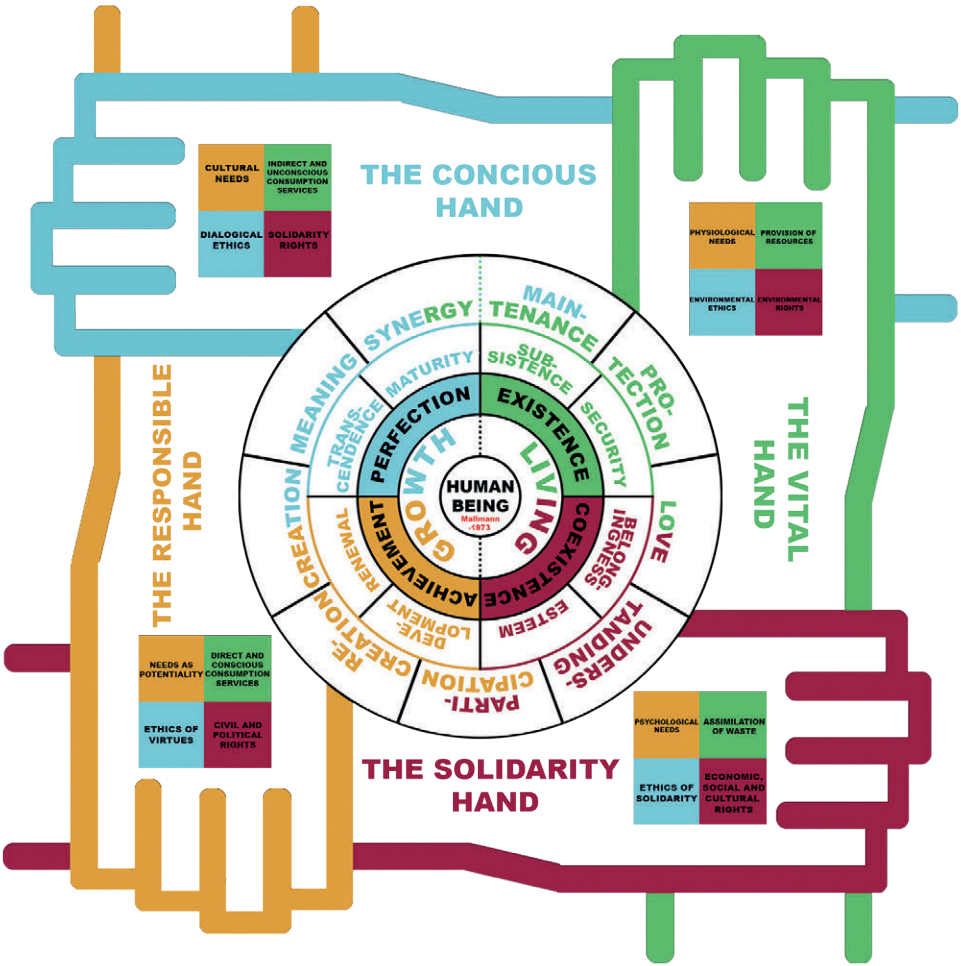


Figure 3: MAMA normative model. Elaborated by the author through his work and Mallmann's framework of human needs.

The solidarity hand (needs: love, understanding and participation)

Babies continue to grow and pass through stages: childhood, adolescence and young adulthood. They are satisfying not only the three needs of the vital stage but also the needs of this stage, which are becoming increasingly critical in their development. Comparing these two children, we observe that while the need for love may already be preceded by a particular deficiency in the "modern" child, at this stage, there may be a deficiency in participation. Complex modern Western societies

are more hierarchical, tend to be more patriarchal than an Indigenous culture chosen at random and suffer from a certain adult-centrism, so the development of participation is more conditioned. The epitome of such participation is well reflected in the governance that countries with representative democracy tend to have. Participation occurs only every four years in decisions that concern all citizens, leaving power to the randomness of that representation. In Indigenous societies, which tend to be more horizontal due to their simpler structures, active participation is facilitated. The assemblies are a welcoming place for dialogue on the problems that concern their members.

The responsible hand (needs: participation, recreation and creation)

Continuing the cycle of life and needs, I would say that all needs are present at any given time in a person's life, and they assume greater or lesser importance depending on the context. At this stage, which we can relate to as adults, these three needs take on greater importance. Children who have grown up have chosen how they want to participate in society, what they will do and how they will pursue their vocation or work. They will most likely find a partner, and the possibility of creating a family will emerge. As we have been tracing from the previous stages, the high or low socio-cultural synergy influences this stage. One characteristic that may differentiate these two children in this experiment is that the child born in an Indigenous village lives in a more static society. In contrast, the "modern" child lives in a more dynamic environment. Creation, or rather "destructive creation," is one of the axes of this "modern" adult, where rapid "progress" creates this dynamic. Additionally, the time allocated for recreation is shorter in complex modern Western societies. Anthropologist Marshall Sahlins estimated that an individual in an affluent Indigenous society spent about 15 to 20 hours a week on their category of work. An individual in our more complex modern society has an average paid workload of at least 35 hours, to which unpaid work must be added. The comparison here reveals a shortage in meeting the need of recreation. This is probably a significant indication that the creations of the next stage (conscious hand) are not synergistic. Recreation inspires us, as witnessed by great imaginative ideas that arise when one is not focused on a problem.

The conscious hand (needs: creation, meaning and synergy)

In the final stage of an older person's life, the question may arise about the legacy, not only material but also immaterial, that one leaves to one's descendants before passing away. A child born in a complex modern society immersed in its culture may question what they have experienced over the course of their life (the midlife crisis) or may remain asleep, consciously or unconsciously. If this awakening occurs, it will be in the process of questioning oneself. Even if the person does not name it as such, what they will realise is that their life has not been synergistic. This is when one is most likely to work to enhance the synergy of one's society. If it does not happen, that low synergy will continue to decline, leaving what we could call "trauma" for the next generation. This occurs through disconnection from Nature, which makes humans more destructive of nature, and through disconnection from other people and societies, especially those that sustain them. Meanwhile, if a child of Indigenous People becomes an Elder, they will continue to transmit high levels of synergy to their descendants through "cultural perpetuity," a process that has been remarkably successful for hundreds of years.

The question for education is, where can we intervene to repair this loss of synergy? As we have seen, this occurs at any stage of a "modern" child's life. At birth, the culture that sustains them is disconnected from nature (see how the Overshoot Day, the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year, is occurring earlier and earlier or how planetary boundaries are redder). In later stages and after that initial inertia, if there is no conscious parenting, initial activism or final adult phase with a certain awakening, the vicious circle will reduce synergy. It is possible and necessary to intervene at all stages; the following paragraphs will clarify this.

Activist Matthieu Lietaert, in his book *Homo Cooperans 2.0*, creatively devised a formula to argued that, in the social sciences and humanities, papers are not taken seriously unless they include mathematical elements. His "excess" formula mirrors the experience of the "modern" individual in the experiment described above.

Unlimited growth = (Consumerism x Hyper-individualism) Advertising

In my work as a researcher and creative, I have found that the formula of the past affluent society might resemble the one below and this could be extrapolated to this new planetary era. Just as the imperial era broke with the tribal era (schismogenesis), the planetary era will break with the imperial era. Let us explain it creatively.

Vital hand = (Responsible hand x Solidarity hand) Conscious hand

- Vital hand. Nature sustains us, and we live by it. Don't bite the hand that feeds us.
- Solidarity hand. Our family, friends, coworkers, fellow global citizens and paysans give us a hand, and we return it.
- Responsible hand. If it were up to me to belong to a good society and live on a healthy planet, the planet would be in good hands.
- Conscious hand. We come from afar, we live and we leave a legacy for posterity. We have handed the true meaning of humanity to others.

It is possible to add another layer to Lietaert's formula and my counter-formula by taking elements from environmental lawyer Gus Speth's quote below and turning them into a formula.

"I used to think the top environmental problems were biodiversity loss, ecosystems collapse and climate change. I thought that with 30 years of good science we could address those problems. But I was wrong. The top environmental problems are selfishness, greed and apathy… and to deal with those we need a spiritual and cultural transformation and we, scientists, don't know how to do that."

Environmental problems = (Greed x Selfishness) Apathy

From an analytical point of view towards my planetary formula, as much time as possible should be spent on the maintenance, protection and love needs behind the vital hand (biology and nature). On the other side of the formula, the exponential factor of the conscious hand (culture) with its needs for creation, meaning and synergy would be the second element to be more careful with and thus dismantle the apathy and the advertisements that direct us. The solidarity hand (society and institutions) with its need for love, understanding and participation is a third and primordial element against hyper-individualism and selfishness. Finally, from a more personal

perspective, the "responsible hand" (psychology) with its needs for participation, recreation and creation is an element that we all need to consider to avoid the consumerism and greed that feeds the vicious circle.

Another way to understand it is to regard the five "hinge" needs at the four cardinal points as key axes (Figure 4).



Figure 4: Four blindnesses and Cardinal direction of human development: Elaborated by the author through his work and Mallmann's framework of needs.

Therefore, the needs for synergy and maintenance connect the conscious and vital hands (North); the need for love links the vital and solidarity hands (East); the need for participation joins the solidarity and responsible hands (South); and finally, the need for creation connects the responsible and conscious hands (West).

The medicine wheel supports this circular, directional form in Native American cultures, as well as in the circular form (bio-psycho-socio-cultural frame) observed in human beings by anthropology.

To conclude this article on a hopeful note, I would like to highlight the concepts, projects and people that are making progress in any direction or "hand." They are all worth pursuing, and the important thing is that they are already creating synergies in the system through a virtuous cycle. Given the rush of our time, it is probably not necessary to reinvent the wheel so much as to learn, practise and readapt these initiatives to improve them. These are just a few elements of an extensive cartography of good practices that I am building as an anthropologist. All are conscious efforts that can be applied in different ways.

- The vital hand (environment and food). Vandana Shiva and her work on seeds, sovereign food and the care and protection of the soil, mainly through the organisation Navdanya; Robin Wall Kimmerer and her scientific research through the Center for Native Peoples and the Environment; The writer Carolyn Steel and her concept Sitopia (a food place); the Green Belt Movement, founded by the Nobel Prize winner Wangari Maathai; the Global Atlas of Environmental Justice. The concept of "ecocide" as an Environmental Ethic and the concept of the "rights of nature" through rivers, lakes or mountains…
- The solidarity hand (work, family, economics, community). The concepts of universal basic services and a universal basic income; various alternative economics, including doughnut economics, circular economics, economics for the common good and caring economics, among others (a list with more than 125 names is currently circulating) the critical voices (journalists) who support our community's thinking on social justice, such as Naomi Klein…
- The responsible hand (health and personal development). The project "Evolved Nest" (mentioned above); the capability approach, led by Nobel Prize winner Amartya Sen and philosopher Martha Nussbaum; the concept of "nature therapy" for increased walking in nature from which the concept of "biomimicry" could emerge. The focus on "human needs" as a framework, as seen in Mallmann and a similar framework by the Right Livelihood Prize winner, Manfred Max-Neef; the Civil Movements for human rights around the world. The concepts radical imagination (Adrienne Maree Brown) and "moral imagination" (Phoebe Tickell) …
- The conscious hand (ethics/education). The concept "warm data" for qualitative relationships by Nora Bateson; the U-lab, led by Otto Scharmer,

based on the U theory; the Charter for Compassion, led by Karen Armstrong, a renowned religious scholar; the Degrowth Movement; the educative works for healing and transforming, "active hope" by Joanna Macy and "hospicing" and "outgrowing modernity" (Vanessa Machado); the voices of Jane Goodall and David Attenborough for educating about the planetary connections and biodiversity…

I conclude this article with three pieces of wisdom that reconnect the past and the future, steps forward and backwards. This year, 2026, marks the 50th anniversary of the book *Catastrophe or New Society?*, and some time ago, Nobel laureate Elinor Ostrom left us a vision for the next 50 years and beyond. Over the next 50 years, the virtuous cycle of the four hands could fit into Ostrom's vision. Between utopias of moving forward and backwards, hope and walking are present.

"Some of our mentality about what it means to have a good life is, I think, not going to help us in the next 50 years. We have to think through how to choose a meaningful life where we're helping one another in ways that really help the Earth."

— Elinor Ostrom

"Utopia is on the horizon. I move two steps closer, it moves two steps further. I walk ten steps and the horizon moves ten steps further. No matter how far I walk, I will never reach it. So what is utopia for? That's what it's for: it's for walking."

— Fernando Birri

Traveler, your footprints

are the only road, nothing else.

Traveler, there is no road;

you make your own path as you walk.

As you walk, you make your own road,

and when you look back you see the path

you will never travel again.

Traveler, there is no road;

only a ship's wake on the sea.

— Antonio Machado

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Biographies

Jesús Martín González is a Spanish independent transdisciplinary researcher with a particular interest in the interconnectedness of human needs with our cultural ideas of wellbeing and sustainability (now regeneration). He developed a professional career as an engineer for 15 years and after achieving a degree in Social and Cultural Anthropology and a Master's in Sustainability and Corporate Social Responsibility, he moved on to analyse and promote possible pathways towards an eco-social transition and a planetary wellbeing society for a further 15 years. martin.jgon@yahoo.com

Designing for hope: AI, collective intelligence and participatory learning

Olga Kokshagina[*]*, Anna-Lena Neurohr and Chahab Nastar*

Abstract

How can the synergy between artificial intelligence (AI) and collective intelligence (CI) transform how we learn and collaborate in the Anthropocene? We explore this question through a participatory research process grounded in co-design. Framing AI as a catalyst for "learning transitions" — both understanding systemic change and reimagining how we learn — we position AI not as a replacement for human intelligence, but as an amplifier of collective problem-solving. Through iterative collaboration with diverse stakeholders, we co-designed four AI-enabled research prototypes: (1) AI-enhanced project-based learning, (2) AI for CI and governance via Model UN, (3) AI literacy, and (4) integrating Indigenous knowledge in AI design. Our approach integrates knowledge mapping, concept exploration and mindful deviation to foster creativity and inclusion. This work aligns with the No Limits to Hope vision by advancing learning paradigms that bridge knowledge and action, support local context and prioritise long-term wellbeing over efficiency in navigating planetary challenges.

Keywords: learning transitions; collective intelligence; artificial intelligence; design; research prototypes

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Introduction

The evolution of AI prompts critical reflection on the future of education and how learning is being shaped. At the same time, addressing the interconnected crises of our time — the polycrisis — demands collective intelligence (CI) to help us find inclusive and sustainable solutions. But how can AI and CI be brought together to transform the way we learn, collaborate and solve the complex challenges of the Anthropocene? To explore this question, we adopt a participatory co-design approach. This creates an experimental space in which diverse stakeholders critically engage with the role of AI in enabling inclusive and systemic transformation. Instead of replacing human intelligence, we believe that AI can augment and amplify collective problem-solving. Through thoughtful integration, AI can support new forms of knowledge creation and collaboration that are essential for building resilient and equitable societies.

Using a co-design approach, we integrated principles of knowledge mapping, concept exploration and mindful deviation to enhance participants' willingness to creatively experiment (Rabello et al., 2024). Based on a questionnaire prior to the workshop, we identified areas of common interest such as ecological and ethical integration of AI in learning, developing (true) AI literacy for all, or AI for collective democracy. Following a process of collective concept exploration and discussion, participants voted on the most promising research directions emerging from the identified areas of interest, to develop concrete research prototypes to carry forward in the co-design process. Four such prototypes were co-designed during the workshop: (1) AI-enhanced project-based learning, (2) AI for collective intelligence and governance, with the specific example of Model UN, (3) AI literacy, and (4) integrating Indigenous knowledge in AI design. In this article we describe the process of co-design used during the workshop and the impact on how we learn and collaborate to address the pressing challenges.

In line with the vision of No Limits to Hope, this work contributes to reimagining learning paradigms that bridge the gap between knowledge and action. We position AI as a tool to fuel the collective intelligence of humans and unlock the transformative potential to address humanity's pressing challenges. Our findings support educators and practitioners in driving systemic change through an iterative, co-design approach to AI development — one that is responsive to local contexts, fosters social learning and prioritises long-term wellbeing over short-term efficiency.

Learning transitions

The concept of learning transitions captures two interconnected dimensions critical for navigating an era of profound global shifts. First, it involves *learning about transitions* — understanding the systemic transformations reshaping our world, from ecological crises and technological advancements to socio-political shifts (UNESCO, 2017). Second, it demands *transitions in learning* — reimagining education itself to empower individuals and communities to act with agency, creativity and ethical foresight in the face of uncertainty (OECD, 2024). To us, these dimensions are inseparable. Addressing global challenges such as the climate crisis, AI-driven inequality and threats to democracy requires more than awareness of these transitions; it demands a transformation in how we learn, teach and collaborate. To foster collective intelligence, interdisciplinarity and ethical innovation, education must move beyond traditional models and embrace dynamic, learner-centred approaches (Swilling, 2020).

Education in a changing world

The world is undergoing rapid and deeply interconnected transformations; climate change, technological disruptions and rising inequality demand systemic responses across ecological, technological and social domains (Köhler et al., 2019; Loorbach et al., 2017; Markard et al., 2012). Education plays a critical role in this transition, equipping individuals with the ability to navigate complexity, rethink outdated structures and co-create sustainable solutions (van Mierlo et al., 2020; Van Poeck et al., 2020).

Ecological transitions demand a shift from extractive to regenerative systems, requiring learners to understand interdependencies between energy, food and water (e.g. Hajer et al., 2015). Technological advances, including AI and automation are reshaping work and ethics, emphasising the need for digital literacy and critical foresight. Meanwhile, social transitions — driven by inequality, polarisation and migration — necessitate skills in intercultural dialogue, equity-centred design and participatory governance. Without an integrated approach, solutions risk being fragmented and ineffective. Thus, education must foster system thinking, interdisciplinarity and adaptability, preparing learners to approach problems from multiple perspectives (UNESCO, 2017).

Yet knowledge acquisition alone is not enough. Traditional education, designed for standardisation and static knowledge, struggles to prepare learners for a rapidly evolving world. Research on 21st-century skills emphasise the need to develop critical thinking, creativity, collaboration and communication alongside subject knowledge

(Cimatti, 2016; Fadel et al., 2015; OECD, 2023; Scott, 2015; World Economic Forum, 2020). These competencies enhance problem-solving, innovation and resilience, enabling individuals to contribute meaningfully to societal change (González-Salamanca et al., 2020; Joynes et al., 2019; Soffel, 2016; UNESCO, 2017).

From traditional models to learning ecosystems

Traditional education follows what Richard Elmore (2020) describes as a "hierarchical individual" model, in which teachers transmit knowledge within a competitive system with rigid success parameters. This structure prioritises memorisation and individual performance, limiting opportunities for imagination, creativity, collaboration and problem-solving — skills crucial for tackling complex global challenges. As societies, driven by technological advancements, environmental crises and shifting social dynamics, evolve rapidly, the education system needs to adapt to prepare learners for an uncertain future (Botkin et al., 1979; World Economic Forum, 2020).

One possible way to address these limitations is through Elmore's "distributed collective" model: learning unfolds in self-organised networks in which individuals share knowledge based on expertise rather than hierarchy. Rather than following rigid structures, members exchange information based on their evolving knowledge and skills. This flexible model mirrors the real-world problem-solving required to address emerging challenges, whose solutions are often unknown in advance (Papageorgiou & Kokshagina, 2022; Bessant et al., 2024). By fostering adaptability, innovation and 21st-century competencies, this model prepares learners to navigate complexity and uncertainty. Crucially, students must have a voice in shaping their education, fostering ownership over their learning journeys and ensuring that education remains responsive to their evolving needs and aspirations.

Embracing this shift requires rethinking not only pedagogical models but also the broader purpose of education. Learning needs to move from passive knowledge absorption to active inquiry, equipping students to question assumptions, analyse systems and anticipate the ethical implications of emerging technologies. Just as the distributed collective model emphasises shared knowledge and collaboration, education fosters interdisciplinary engagement, connecting learners across disciplines, cultures and power structures. Moreover, metacognitive awareness — the ability to reflect on one's learning processes and biases — is essential for continuous growth and informed decision-making.

Learning transitions present an opportunity to reframe education as a tool for addressing complex challenges. Shifting how we learn can support individuals

and communities in navigating and contributing to more equitable futures. This involves recognising uncertainty as a valuable aspect of learning, exploring the use of AI to enable more personalised and collaborative approaches, and considering how issues of justice are integrated into educational design. The ways we approach learning today will influence our capacity to respond to the challenges of tomorrow. Embracing learning transitions may help education evolve into a more adaptive and reflective process — one that is better aligned with the complexity of the world it aims to engage with.

How can AI support collective intelligence in learning transitions?

Collective intelligence (CI) refers to the emergent capacity that arises when individuals collaborate — supported by digital technologies — to mobilise diverse knowledge, experiences and insights towards a shared goal (Aristeidou & Herodotou, 2020; Woolley & Gupta, 2024). Unlike individual cognition, CI is not simply the sum of its parts but the outcome of dynamic interaction, feedback and mutual learning among people, technologies and environments.

Traditionally, CI research has followed two main streams. The first conceptualises CI as the aggregation of contributions from groups, often via crowdsourcing or online collaboration platforms. This is sometimes conflated with the "wisdom of crowds," which emphasises the statistical averaging of diverse, independent judgments to improve predictions or decisions (Da & Huang, 2020). While useful, this perspective tends to emphasise quantity and independence over interaction and development of shared meaning.

As AI continues to evolve, some narratives suggest it could replace human intelligence to solve societal problems. This view has been widely criticised. Rather than viewing AI as a substitute for human thought, we position it as a complement — a tool to amplify human creativity, contextual judgment and relational understanding. While AI brings speed, scalability and pattern recognition, human intelligence contributes intuition, ethical reasoning and firsthand experience. This perspective aligns with the concept of hybrid CI in which humans and AI develop joint systems of reasoning and action. The question is no longer whether AI can outperform humans, but how AI and humans can collaborate in ways that enhance systemic learning, ethical foresight and adaptive capacity (Dellermann et al., 2019).

Academic literature offers robust conceptual frameworks and early prototypes for human–AI collectives that foster collective intelligence in education (Casebourne et

al., 2025; Holstein et al., 2020; Gonzalez et al., 2023). While many frameworks explicitly target paradigm shifts, cultural transformation and new knowledge creation at scale, none provide empirical evidence of achieving transformation beyond proof-of-concept or local interventions. In the context of learning transitions, this perspective is important. AI should not merely optimise content delivery or personalise learning experiences — it must help learners and communities make sense of complexity, co-define problems and imagine new futures. Our objective is to explore how AI can augment collective learning processes, foster inclusive co-design and enable systemic transitions in education aligned with long-term human and planetary wellbeing.

Integrating AI and CI into learning transitions

To address the urgent need for reimagining education in the context of global challenges, we organised a research workshop on this critical topic. Recognising that existing educational systems lack necessary tools, frameworks and interdisciplinary collaboration to prepare learners for an uncertain future, the workshop brought together experts from diverse fields, including data science, educational science, psychology and social sciences (among others). The goal was to explore how emerging technologies like AI and collective intelligence can drive transformative learning practices. Rather than merely theorising, we aimed to design actionable research prototypes that bridged gaps between innovation and equitable, learner-centred pedagogies.

Co-design approach

Understanding the complexity of this task, the design process was structured around three interconnected phases rooted in participatory co-design principles (Rabello et al., 2024):

- **Establishing a shared understanding**: Examining the state of the art in AI and collective intelligence research while discussing major challenges.
- **Identifying research objectives**: Defined emerging research objectives to guide future exploration.
- **Designing research prototypes**: Building on these research objectives, participants developed research prototypes and roadmaps.

The outcomes of the workshop aim to spark a new wave of research at the intersection of AI, collective intelligence and learning transitions. By fostering a shared vision of technology's role in education — not as a replacement for human

connection but as a scaffold for agency, creativity and collaboration — we seek to empower researchers and practitioners to create tools that are both ethically grounded and technologically advanced. This initiative reflects our core belief: transforming education requires not just new tools but new ways of thinking together, harnessing the collective ingenuity of diverse minds to build systems that prepare us not just for the future we anticipate but for the futures we must imagine and create.

Cartography of research directions

To establish a shared understanding and identify emerging research directions within the framework of the workshop, participants were asked to share their vision by filling a short questionnaire before the workshop. Questions included, for example: *Do you have any examples of projects or research in this field that you would like to share? In your opinion, what are some key research directions in this field? If you could imagine the ideal project, what would it focus on and why?* The goal was to see whether there was any convergence in topics and interests, how participants see the field going forward and what shared capacity was available.

Based on 21 responses prior to the workshop, we identified the main axes based on key research directions, and ideal projects (see Appendix 1 and Figure 1 below). The responses were analysed inductively by colliding together the examples shared and the personal visions and expertise of each participant. Eight categories were identified.

During the workshop, participants were able to review and add additional ideas and then vote for the most promising directions to explore during the workshop (please see photos below and Appendix 1). We have collectively discussed different ideas and organised a voting exercise (two votes per person) to identify areas that appeared particularly promising for further exploration and the design of research prototypes (see dots in 2a). Overall, five ideas were chosen as promising research directions, and groups were created to explore those ideas in detail during the workshop (see 2b). The results section summarises the prototypes designed during the workshop.



Figure 1: Mapping of preliminary research directions



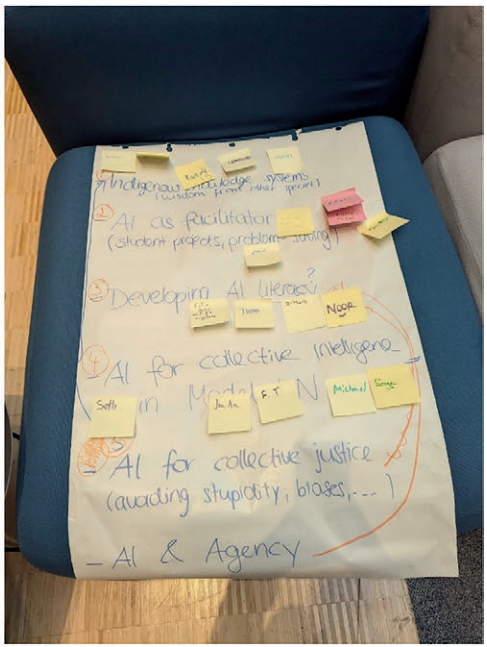


Figure 2a: Collective ideation — developing shared understanding.
Figure 2b: Selection of research directions to explore

Synthesis: A model of co-design

The workshop's success lay in its design. By blending structured preparation (pre-workshop frameworks) with participatory flexibility, it bridged disciplines without diluting expertise. Participants highlighted three strengths:

- **From silos to synergy**: Breaking disciplinary barriers allowed experts to "approach the same point from many directions," as one of the participants noted, uncovering novel solutions.
- **Action over abstraction**: Concrete prototypes — such as decentralised knowledge networks or equity-centred AI curricula — demonstrated the power of building, not just talking.
- **Roadmaps for impact**: The summary document and research priorities provide a springboard for funding bids and global partnerships, ensuring ideas evolve into action.

Below we present four co-designed research prototypes aimed at enabling learning transitions (Results section) and reflect on their implications for the future of learning (Discussion section).

Results of the co-design process

Prototype 1: AI-enhanced project-based learning prototype

This research prototype investigates how AI can scale project-based learning (PBL) by acting as a facilitator to foster cognitive and social-emotional skills. Key functions include monitoring group dynamics to ensure equitable participation and guiding students through project management basics like goal setting and budgeting. To validate the system, large-scale international A/B testing will compare group performance with and without AI support, analysing both effectiveness and cross-cultural influences.

Crucially, the AI is designed to support rather than replace teachers, enabling them to transition into mentorship roles. By self-regulating its interventions and varying its involvement — from active facilitator to observer — the prototype aims to empower students to develop essential collaboration and critical thinking capabilities in diverse contexts.

Prototype 2: AI for CI in the Model UN framework

This prototype explored integrating AI into Model United Nations (MUN) to transform global education and diplomacy. The core proposal involves a digital platform that aggregates MUN outputs — resolutions and debates — using AI for summarisation, translation and synthesis.

It includes:

- Educational enhancement where the system functions as a personalised tutor, providing feedback on argumentation while verifying facts and alignment with UN Sustainable Development Goals. This transforms simulations into iterative learning processes.
- The platform aims to synthesise thousands of student proposals into coherent policy briefs for real UN bodies, leveraging collective intelligence to address representation gaps.
- To maintain quality, a tiered "Youth UN Council" was proposed. Participants emphasised using AI for preparation and post-debate analysis rather than live

intervention, preserving the human core of negotiation.

This initiative envisions a symbiotic relationship in which AI tools not only elevate youth perspectives but also prototype more inclusive, adaptive models for global governance.

Prototype 3: AI Literacy: towards a transdisciplinary framework

The workshop identified AI literacy as a critical, multidimensional competency essential for navigating modern society. Beyond technical skills, this literacy involves understanding ethics and biases, functioning as a foundation for both evolving careers and active citizenship.

To address this, the CAIL (Collective AI Literacy) initiative was proposed as a participatory research project to co-design a transdisciplinary high school syllabus.

Key components include:

- Integrating AI literacy with subjects like ethics and STEM to foster critical thinking and prevent uncritical reliance on AI outputs.
- Fostering multistakeholder collaboration by involving researchers, educators, industry experts and students to ensure the syllabus remains relevant to real-world job markets and lived experiences.
- Utilising an iterative design process to overcome challenges such as rapid technological advancement and institutional resistance.

CAIL aims to move beyond mere adaptation, empowering learners with the agency to actively shape the trajectory of AI through informed, collective intelligence.

Prototype 4: Integrating Indigenous knowledge systems into AI design

This research integrates Indigenous knowledge systems (IKS) into AI design using the "two-eyed seeing" methodology, harmonising Western science with Indigenous epistemologies. A global network of Indigenous-led labs, starting in Australia and Canada, will co-design systems that surface "missing intelligences" through land-based practices and multispecies stewardship.

Key technical and ethical components include:

- Developing AI capable of analysing audio-visual content (e.g. ceremonial dances) to capture embodied, non-textual knowledge, challenging the dominance of literacy in AI.
- Training models on Indigenous languages with attention to relational

grammars (e.g. grammatical structures in which the verb plays a central role) and creating intercultural dictionaries to bridge semantic gaps.

- Implementing community-led protocols and decentralised ownership to ensure data sovereignty.

This direction moves from extractive colonial paradigms with regenerative, intercultural ecosystems, blending AI literacy with cultural stewardship to empower youth and sustain diverse ways of knowing.

Discussion: Supporting learning transitions

The challenges of the 21st century — climate instability, technological disruption and social fragmentation — require a radical educational shift in how we design and deliver education. Current systems, built around individual performance, competition and standardisation, are increasingly inadequate in the face of interconnected global crises. This work contributes to the growing recognition that education must be reimagined as a driver of systemic change and planetary health, rooted in collaboration, inclusivity and ethical responsibility.

Our work directly responds to the call made in the 1979 report to the Club of Rome *No Limits to Learning*, which identified a critical "human gap" between growing global complexity and humanity's limited capacity to understand and respond (Botkin et al., 1979). The report urged a shift from "maintenance learning" to "innovative learning," highlighting the importance of anticipation and participation in fostering individual and societal growth. Aligned with this vision, our co-design work aimed to bridge this gap by cultivating collective intelligence and foresight. Through a co-design process involving diverse stakeholders, we are democratising innovation, surfacing richer forms of knowledge and prototyping viable alternatives for an educational system capable of nurturing critical judgment and a global perspective — key competencies for navigating and shaping an uncertain future through anticipatory and participatory learning.

By integrating AI and CI, we propose an educational paradigm shift that positions AI not simply as a tool for efficiency (e.g. personalised tutoring or automated grading) but as a partner in fostering systems thinking, ethical reflection and collaborative problem-solving. In this new model, AI becomes an enabler of collective learning: facilitating group sense-making, enhancing shared memory and supporting equitable participation across differences in age, expertise and culture.

Our concept of learning transitions recognises two simultaneous shifts: learning

about transitions — understanding the deep systemic changes shaping our world — and transitions in learning — redefining how we learn in ways that are participatory, adaptive and aligned with long-term wellbeing. This approach demands learning environments that embrace uncertainty as a core design principle and cultivate the ethical foresight needed to thrive in turbulent times.

The research process demonstrated the value of co-design as both process and pedagogy. Participants from diverse disciplines collaborated to develop four research prototypes, each addressing a key dimension of future-learning ecosystems: AI-enhanced project-based learning, AI in governance (Model UN), AI literacy and the integration of Indigenous knowledge systems into AI design. As Dr Stinkowitch remarked: "It's a very interesting format for research. Maybe you are not used to doing this kind of co-design activities, because most of the time we are working in silos. So we are among experts of the same domain. I think it's important to have a workshop like that, where everyone can work together and build something concrete at the end and not just discuss ideas. So I think it's very interesting to work like that."

The proposed research prototypes show that learning ecosystems must be dynamic and inclusive, supporting interdisciplinary and intergenerational dialogue, peer-to-peer learning and the co-definition of problems and solutions (Papageorgiou & Kokshagina, 2022). At the heart of this learning transition is the creation of dynamic learning ecosystems that intentionally elevate under-represented domains, such as AI literacy, peacebuilding, socio-emotional learning and sustainability, equipping learners with the competencies to address complex, interconnected polycrises (Prototype 2 and 3). These ecosystems reject siloed knowledge in favour of project-based, interdisciplinary approaches that blend research, creativity and social entrepreneurship (Prototype 1). AI becomes a collaborator, fostering essential 21st century skills like adaptability, critical thinking and responsible innovation, while CI amplifies diverse voices, ensuring the co-design of equitable and inclusive solutions (Prototype 2 and 4).

These transformative models must embed ethics at every stage of learning and development, ensuring that technological advancements serve the collective flourishing of humanity as opposed to narrow, self-serving interests. By involving learners in the co-creation of curricula and pedagogies, education itself becomes a participatory process that builds a strong sense of agency, collective responsibility and solidarity (Prototype 2). This transformation also requires educational institutions urgently prioritise planetary health. Teaching care — for oneself, for others and for the planet — must become a foundational competency for a sustainable future.

The future of learning depends on our collective ability to develop holistic competencies for the 21st century: the courage to face uncertainty, the creativity to design viable alternatives and the humility to learn across cultures and generations. We must build educational systems that value diverse forms of knowledge and recognise that active engagement is rigorous as traditional academic achievement. CI expands beyond cognition to include emotional, social and ethical dimensions — requiring AI to support not just knowledge transmission but also metacognitive development, empathy and pluralism.

This work aligns with the vision of No Limits to Hope: learning must become a practice of hope-in-action, one that equips individuals and communities to navigate complexity, act with agency and co-create regenerative futures. Co-designed workshops — bringing together educators, learners, researchers, policymakers and community leaders — are essential for this transformation. They democratise innovation, surface diverse knowledge and help prototype viable alternatives to existing models.

In conclusion, learning transitions prompt us to ask not just *how* we use AI in education, but *how we learn with AI* to build a more just and sustainable world. This demands that AI and CI work in tandem to invent new educational paradigms that embrace uncertainty, prioritise planetary justice and cultivate the collective foresight needed to ethically navigate this century's complex transitions.

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There are no limits to learning — when we learn with the world

Iveta Silova[*], *Jeremy Rappleye and Hikaru Komatsu*

Abstract

What does it mean to claim there are no limits to learning — especially in a moment defined by planetary limits? This contribution takes seriously the proposition that learning, in its fullest sense, is not merely a technical process of information transfer but an ontological unfolding: a transformation in how we relate to ourselves, others and the living world. In dialogue with *The Limits to Growth* (1972) and the hopeful intervention of *No Limits to Learning* (1979), this paper argues that the future of education depends on our capacity to learn with the world, not just about it.

The dominant image of the learner in contemporary schooling remains tethered to the independent self — a construct shaped by Enlightenment rationalism and liberal modernity. This image distorts the relational nature of being and contributes to ecological harm by disembedding individuals from their communities and ecosystems. In contrast, many non-Western traditions — including Indigenous knowledge systems, animist cosmologies, African philosophies and Asian pedagogies — understand learning as emergent, situated and participatory. Knowledge arises through relationship: with land, kin, ancestors and more-than-human beings. Learning, in these contexts, is not about mastery, but attunement — becoming-with the world.

This paper builds a conceptual bridge between these traditions and contemporary relational theories of education, including the distinction between Type I and Type II learning. We propose learning as mutual transformation between learner and world.

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Learning with the world, in this view, is a mode of being. It invites pedagogies rooted in interdependence and an education without limits.

Keywords: Relational pedagogy, interdependence, Indigenous knowledge systems, ontological learning, planetary sustainability

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"Learning is more than a global problem: its failure is, in a fundamental way, the issue of issues."

— *No Limits to Learning* (Botkin, 1979, p. 9)

Introduction

What does it mean to claim there are no limits to learning — especially in a moment defined by planetary limits? This contribution takes seriously the proposition that learning, in its fullest sense, is not merely a technical process of information transfer, but an ontological unfolding: a transformation in how we relate to ourselves, others and the living world. In dialogue with *The Limits to Growth* (1972) and the hopeful intervention of *No Limits to Learning* (1979), we argue that the future of education depends on our capacity to learn *with* the world, not just *about* it.

If, as the 1979 report insists, the failure of learning is "the issue of issues," then we must ask: What kind of learning has failed — and what forms of learning might still be possible? The dominant global education agenda has long treated learning as a neutral input or technical fix, abstracted from culture, context and ecology. In contrast, we argue that learning is always political, philosophical and relational. To learn otherwise — to learn with the world — requires not only pedagogical innovation but a transformation in how we know, who we are as learners and what we are willing to become.

Extending the thinking behind *The Limits to Growth* (1972) to education, *No Limits to Learning* (1979) concludes with a call to "global interdependence" and caution about universal approaches:

"global interdependence through the flourishing of a plurality of cultures exclude[s] the viability of a single universal learning model. Human beings are of one species with a whole universe of common traits, and their learning processes are akin to one another, but each individual or group has their specificity which makes each of them different from one another. This is a hopeful sign to a new learning perspective, if it is taken with seriousness by those whose position and function in the power structure could lead the way to planetary cultural understanding" (Botkin

et al., 1979, pp. 116-117)

Here the view is that a diversity of ways of learning leads to both "global interdependence" and ecological viability. Solidarity and sustainability through learning to learn differently. Unfortunately, in the four decades since this call was issued, it is precisely the presumption of a single universal learning model that has triumphed: the OECD's PISA studies built on universalistic "competencies"; the World Bank's knowledge capital claims and Human Capital Index; the push for science, technology, engineering and mathematics (STEM); the rush to yield all learning to AI, algorithms and other universal technological fixes. Instead of heeding the call to proliferate our sources of learning and learn with the world, the trend has been to learn about the world without thinking about how we learn (see Common Worlds Research Collective, 2020).

Is it any wonder, then, that we have been unable to meet the sustainability imperative and see the accelerating breakdown of "global interdependence," a fragile and fledgling accomplishment of the immediate post–World War II period?

In what follows, we seek to sketch an alternative form of learning, one that answers the Club of Rome's call to develop a new learning perspective. It exists beyond the dominant models of today, forged from Enlightenment rationalism and liberal modernity, and the underlying assumption of independent selfhood that they subscribe to and promote. We make no claims that this alternative model is universal, but we do show — after outlining its features — a range of empirical evidence that it meets the ecological challenge to a greater extent. We then extend this conceptualisation — Type I and Type II learning models — to explore connections with many non-Western traditions. Although each of these indeed has its own specificity, which makes them different from one another through the lens of Type II learning, they all coalesce around learning with the world, as opposed to attempting to stand independently of it and merely learn about it.

What kind of learning has failed? What kind might endure?

Contemporary education is built around a narrow conception of learning: mastering content, acquiring competences and demonstrating performance. This model — what we call Type I learning — has deeper historical roots. It echoes Gregory Bateson's (1972) concept of Learning I, which reinforces patterns within a fixed frame, and contrasts with Learning II, where the frame itself shifts. Likewise, *No Limits to Learning* (1979) distinguished between maintenance learning, which sustains existing systems, and innovative learning, which enables transformation.

Our framing of Type I and Type II learning builds on this intellectual lineage, while situating it firmly in today's global education landscape — one increasingly shaped by datafication, technocratic policy and the pursuit of efficiency at scale.

Type I learning assumes a stable learner operating within known systems towards measurable outcomes. It underpins standardised testing, behavioural metrics, global assessments and algorithmic optimisation. But in a world marked by ecological collapse and ontological uncertainty, this paradigm has reached its limits. Type I learning teaches us to optimise systems that are failing, rather than to question the assumptions they are built on. It prepares students to succeed within structures that are themselves unravelling. And it isolates learners from the world they inhabit, abstracting education from land, history and relationship. In doing so, it not only fails to equip us for facing the planetary crisis — it deepens the crisis by reinforcing the illusions of mastery, separation and control (Komatsu et al., 2020, 2021, 2023; Silova, 2021).

Type II learning offers an alternative. Rather than operating within a fixed frame, it transforms the learner's frame of reference. It is recursive rather than linear, relational rather than extractive, ontological rather than merely cognitive. Where Type I seeks mastery, Type II demands attunement: a willingness to be changed by what one encounters. This distinction is further articulated in Table 1 below, which compares and contrasts the pedagogical and ontological assumptions embedded in each mode of learning.

Table 1. Contrasting Type I and Type II learning

Dimension	Type I learning	Type II learning
Pedagogical Level		
Frame of reference	Operates within existing frames; confirms established knowledge and norms	Transforms the learner's frame; challenges assumptions; opens to new ontologies
Goal of learning	Mastery, accuracy, efficiency, measurable performance	Attunement, transformation, relational awareness, ethical responsibility
Role of authority	Learner as independent agent or consumer	Teacher, community or nature as guide or co-participant
Pathway to learning	Individualised instruction, content delivery, goal-setting	Imitation, practice, persistence, humility, ecological reciprocity
Learning process	Linear, segmented, outcome-oriented	Recursive, unfolding, uncertain, ethically charged
Philosophical and ontological levels		
Knowledge	Bounded, extractable, finite; object-centred	Emergent, relational, infinite; world-centred
Self	Autonomous, rational, consistent, stable	Relational, becoming, contingent, ecologically embedded
Relation to the world	Detached observer; learning *about* the world	Embedded participant; learning *with* the world
Time horizon	Short-term; efficiency-focused	Long-term; lifelong learning, seasonal/cyclical rhythms
Ecological disposition	Extraction, control, instrumental use of knowledge	Responsiveness, reciprocity and care for interdependent systems

Note: This table draws upon and extends the conceptual distinction introduced by Komatsu and Rappleye (2017).

This reframing is particularly urgent in the context of climate crisis, biodiversity loss and social fragmentation. In an age when mastery — over nature, over others, over possible futures — has brought us to the edge of collapse, education must cultivate something else: the capacity for attunement. By attunement, we mean the ability to sense, respond and adapt to the rhythms and relations that shape life. It is not passive submission but an active orientation of the self towards interdependence. Type II learning cultivates this orientation. It does not treat knowledge as a commodity to be extracted, but as something emergent through relationships. It shifts the locus of authority from individual mastery to shared becoming, from external performance to internal transformation.

In this light, education becomes less about preparation for predefined futures and more about readiness in the face of the unknown. Type II learning resituates knowledge within a deeper commitment to relational life. It requires persistence, not speed; openness, not certainty; discomfort, not mastery. Many non-Western traditions — including Indigenous knowledge systems, animist worldviews, African cosmologies and Asian philosophies — understand learning in this way: as an emergent, participatory process. These traditions do not treat knowledge as an object to be acquired but as a relational unfolding — something that arises through embeddedness in land, community and spirit. Their approaches align closely with the ethos of Type II learning, offering important resources for imagining education otherwise.

Yet this mode of learning remains marginal to dominant education reform. Standardised assessments like PISA continue to measure what fits the Type I frame: efficiency, standardisation and surface-level performance. Even climate education often reduces systemic crisis to behavioural messaging or technological literacy. But what if the core challenge is not how to optimise learning but how to relearn how to learn?

To move towards Type II learning is to embrace an ontological shift. It is to understand education not as a linear transmission of facts but as a condition for transformation. In this paradigm, teachers are not simply conveyors of knowledge but facilitators of becoming — a living example of a Type II learning. Learners are not consumers of information but co-actors in entangled systems of meaning and survival. And learning itself becomes a practice of ethical relation — of being-with, becoming-with and enduring-with others in a precarious world.

What adapts, endures: cultural flexibility as a learning disposition

While Type II learning is often marginalised in dominant education systems, especially in the West, its dispositions — persistence, humility and openness — are embedded in broader cultural orientations towards uncertainty and change. One empirical entry point into this terrain is the flexibility —the monumentalism dimension developed by Minkov and Kaasa (2021), which offers insight into how different societies conceptualise the self. In this framework, flexibility reflects a belief that the self is adaptable, modest and responsive to context. Monumentalism, by contrast, valorises pride, consistency and resistance to change. These are not just personal traits but deeply cultural orientations. They map closely onto the learning models outlined earlier: flexibility mirrors Type II learning, while monumentalism echoes the logic of Type I.

To explore this alignment, we drew on national flexibility scores (Minkov & Kaasa, 2021) and COVID-19 mortality data from the NORRAG education research initiative (Rappleye et al., 2021). Plotting flexibility against COVID-19 deaths per million revealed a striking pattern: countries with higher flexibility experienced significantly lower pandemic mortality. The correlation coefficient (r = –0.64 with a bootstrapping confidence interval [-0.84, -0.35]) suggests that adaptive cultural orientations supported more effective responses under crisis conditions.

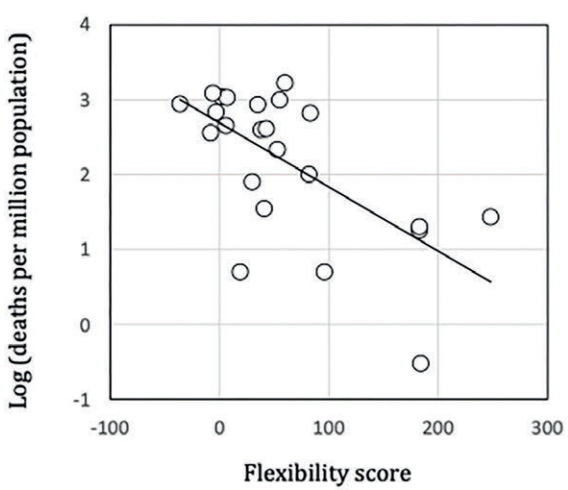


Figure 1: Flexibility scores vs. log of COVID-19 deaths per million

Note: Our analysis focused on affluent countries with a per capita GDP exceeding 40,000 international dollars. In contrast, low-income countries often reported disproportionately high percentages of positive cases among those tested, suggesting limited testing capacity. As a result, the accuracy of death data from these countries might be low.

This finding does not imply causation, nor does it reduce crisis response to cultural traits. But it does highlight an important insight: societies oriented towards adaptation and relational responsiveness were better able to navigate the unknown. Monumentalist systems — which emphasise certainty, heroism and national pride and resist dialectical complexity — struggled to respond flexibly to emergent realities.

Flexibility, in this context, is more than a value — it is an ontological readiness. It presumes that survival requires transformation, not performance. It echoes the core logic of Type II learning: the self is not fixed but formed through relationship, persistence and receptivity. As Minkov and Kaasa (2021) explain, flexibility reflects "the belief that personal adaptation is essential for success in a changing world" (p. 4). This makes it a powerful cultural foundation for learning with the world.

The implications are significant. Type II learning is often dismissed as soft or abstract. But the flexibility data suggest otherwise: the very dispositions it cultivates — slowness, humility, openness — are linked to adaptive capacity on a societal scale. They are not just pedagogical virtues. They are survival strategies.

Importantly, flexibility is not distributed evenly. It tends to be more prevalent in East and Southeast Asia, some African regions and post-socialist societies — contexts often marginalised in global learning discourse. Monumentalism is more prominent in the West and Latin America, complicating simplistic global hierarchies of power and privilege. It also challenges the assumption that high-performing systems necessarily embody Type I values. Countries like Japan, South Korea and Singapore pair high flexibility scores with traditions of mimicry, endurance and deference — structures that scaffold Type II dispositions rather than suppress them.

In this way, flexibility serves as both a mirror and a metric. It reveals how certain cultures nurture the relational capacities needed to live with uncertainty. It reminds us that Type II learning is not a theoretical ideal — it is already at work in places where people know how to adapt without breaking.

At the same time, this analysis signals a warning. Education systems built on monumentalism — on speed, confidence and mastery — may lack the tools necessary to cope when their foundational assumptions collapse. These systems reward students who excel under fixed conditions. But in a volatile world, those conditions

are anything but fixed.

This is the risk facing global education reform. In chasing measurable outcomes, policymakers often reinforce the very dispositions that undermine resilience. Flexibility is harder to standardise. It resists quantification. But it may be exactly what planetary survival demands. The capacity to adapt — both ontologically and educationally — is shaped not only by policy but by deep, often invisible, assumptions about who we are and how we change. If we are to cultivate the kind of learning that endures, we must look beyond what learners know to how they are positioned to learn — and to be transformed.

Learning otherwise: plural pedagogies and planetary possibilities

If Type II learning is not yet widely institutionalised, it is nonetheless deeply rooted in traditions that have long resisted the myth of the autonomous learner. Across Indigenous, post-socialist, African and Asian contexts, we find pedagogies grounded not in mastery, speed or standardisation but in relational attunement, repetition, humility and care. These are not alternative methods to be replicated; they are ontological orientations towards becoming-with the world.

In Japanese education, for instance, the verb *manabu* (to learn) is derived from *manebu*, meaning "to imitate." But as Komatsu and Rappleye (2017) show, imitation in this context is not mechanical copying. It is a moral, relational practice that positions the learner not as an autonomous agent, but as someone formed through persistent guidance, deference and trust in the teacher. The learner needs to empty themselves and wait until the self is cultivated over time — not through self-expression but through attunement to others (Uchida, 2013). Learning thus becomes an ethical process of becoming-with, in which success depends less on innate ability and more on enduring commitment to a shared rhythm. This contrasts deeply with Western ideals of self-directed autonomy and speed.

In Aboriginal Australian pedagogy, learning is deeply intertwined with the concept of "Country." This approach emphasises listening to stories embedded in landforms, moving with the rhythms of the seasons and engaging in practices such as walking and observing. Knowledge is not transmitted through conventional curricula but is revealed through presence, silence and embodied experience. Country is not merely a backdrop but a living teacher — a more-than-human authority that communicates, waits and guides. This form of learning, often referred to as "learning from Country," fosters a deep relational attunement to land, kin and spirit (Burgess, 2022).

A similar orientation is evident in North American Indigenous education. In the Anishinaabe community, for example, learning is rooted in relational accountability, where stories, ceremonies and seasonal activities are integral to the educational process. Knowledge is held within relationships — not only among people but also with animals, lakes, trees and ancestors (Simpson, 2014). Educational practices emphasise respect, gift-giving and attentive listening, aiming not merely at information acquisition but at orientation and ethical living. This approach underscores the importance of land-based education in fostering identity, belonging and wellbeing among Indigenous youth (see also Smith et al., 2018; Kimmerer, 2013).

Across many African Indigenous knowledge systems, similar principles shape learning as a deeply participatory and forward-looking process. It is transmitted through proverbs, ritual, apprenticeship and storytelling — often outdoors, in context and with intergenerational involvement (Dei, 2013). As Onwuatuegwu and Paul-Mgbeafulike (2023) observe, African traditional education frameworks are founded on ancestral wisdom that sustains ecological balance and binds individual growth to collective flourishing. Such education does not separate intellect from land or learner from community. Rather, it cultivates attentiveness, humility and a deep sense of responsibility — qualities essential for navigating both contemporary disruptions and long-term planetary sustainability.

What links these practices across different contexts is their shared orientation: attunement over extraction, relation over abstraction, becoming over benchmarking. The learner is not an isolated actor, but a part of a wider web of relations. Learning is not content delivery, but transformation of self through relationships. These are not "best practices" to be scaled but ways of being that endure, because they are attuned to the conditions of life.

Such pedagogies may not conform to the metrics of global education reform, because they are often perceived by policymakers as too relational, too context-bound, too entangled in lived worlds. Yet they make visible what Type II learning looks like in practice. As *No Limits to Learning* (1979) emphasised, what planetary survival requires is not a single solution but a plurality of models rooted in diverse ways of knowing and relating. This plural orientation reframes the very purpose of education. The challenge is not to identify a universal blueprint but to nurture ecologies of learning that are responsive, reciprocal and grounded.

Beyond improvement, towards transformation

Our attempts to relate a "new learning perspective" answer the Club of Rome's calls to rethink learning in the face of the sustainability imperative. Even today, the *No Limits to Learning*'s (1979) concluding proposal rings true: "Future research might clarify the human learning process. Today, we are only able to answer the less ambitious question: How can we improve our learning?" (p. 137). It is precisely this more limiting question that still structures the dominant trends in education — PISA, human/knowledge capital, STEM and AI-enhanced learning. The world's most influential education agendas remain locked into a shallow, technical paradigm of learning improvement, while neglecting deeper questions: What are we learning for? How must we learn differently as we approach the limits to growth? How has the pursuit for learning improvement itself led us into an existential crisis?

For those of us — including the authors of *No Limits to Learning* — who have repeatedly called for different forms of learning, this moment can feel disheartening. Alternative forms of learning abound and yet remain largely unrecognised by mainstream education reform efforts. Global leaders in education policy point to the sustainability imperative but have surprisingly little to offer in terms of constructive suggestions (Rappleye et al., 2024). In this essay, we have suggested that Type I learning itself is the problem: it cannot access what lies beyond its frame. As we have written elsewhere, there are larger historical and geopolitical forces at play. Here, too, *No Limits to Learning* (1979) offered an analysis that still holds:

"There is a form of behaviour, often unconscious, which appears to others as cultural aggression. Another name for it could be misguided ethnocentrism. This behaviour, mainly characteristic of the North, is a threat to international understanding and needs to be *unlearned*…A world system vulnerable to the cultural aggression of some and the cultural disintegration of others is hardly a reliable basis for mutual understanding, dialogue, cooperation, joint ventures and solidarity. It is obvious that this situation has some roots in colonialism." (p. 114, emphasis added)

In our work, we too have argued that "development" needs to be unlearned (Silova et al., 2025) — not simply as a failed policy framework but as a persistent mode of knowing that continues to operate as "colonial residue" (Kirschglaser, 2024), precisely because it fails to learn from its own failures. And yet, even within the field of education — even among many who speak of equity, sustainability and transformation — we have seen a particular form of cultural aggression emerge as response to the efforts of diversifying learning, fostering interdependence and confronting planetary crisis. So we must ask: Can Type II learning take root in

a world still shaped by misguided ethnocentrism? Can we truly learn otherwise if the conditions of knowing remain tethered to systems of mastery, speed and abstraction?

We believe the answer is yes — but only if we are willing to do what learning with the world actually demands: to stay attuned, to unlearn what we have inherited and to cultivate new ways of being and becoming that are relational, situated and unfinished. Type II learning is an ontological commitment to reinhabiting the world differently. In a moment defined by planetary limits, it may be the only kind of learning that still holds hope.

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Conclusion

Carlos Álvarez Pereira, Mario Salomone and Raad Sharar

We hope the experience of reading this book has been like breathing in fresh air. The mainstream narrative is often as polluted as the planet's air, and this is a text no one should do without, especially policymakers and those who work in the education sector serving all ages.

We will try to explain why.

First, as we have seen, a wide repertoire of case studies from all continents and across a broad range of social and institutional realities, including universities, schools, NGOs, Indigenous communities and social movements, enrich the volume. The authors consider all age groups, from early childhood to adulthood. The transformative learning methods proposed here have also proven valid and effective in educational pathways for highly specific professions, with evidence of multicultural and multilingual curricula designed to address the "world problematique." One of the challenges of transformative learning, in fact, is its realisation not only in basic education common to all but also in specialised education and training for engineers, economists, doctors, jurists and others.

The case studies are a portrait of a pluriverse world: they are situated, distinct and well-grounded, so that they can be read as dispatches from the future of a transformed, revolutionised education.

A second reason for interest is that all the authors are fully aware of the challenges facing education and learning in an era of even more rapid and profound change. This era is increasingly revealing itself as one of "polycrisis": a climate, social, cultural and, therefore, also (and for us in the first place) educational crisis. We live in a time of profound transformation. Still, we do not yet know whether the transformation is a phase *within* the Anthropocene or a transition phase (to be evaluated over decades) from the Anthropocene to an unknown post-Anthropocene.

The central issue remains the one at the centre of the 1979 report *No Limits to Learning*. How to bridge the *human gap*, the gap that measures the distance between how much we know (which is a lot, although not enough) and how unable we are to transform knowledge into effective and responsible action. The doubt, therefore, arises, more than legitimately, that the problem lies in the knowledge and in the ways

we have used so far to transmit it. Changing knowledge and changing the way it is transmitted is the problem that the authors of this volume have set themselves to tackle.

A clear message: you cannot change the world without profound change

The message we get from reading the book is clear: you cannot change the world without changing the system of values, interhuman and interspecies relationships and their perception, including their inner perception. Transformation is both systemic and personal, and it does not happen without the other. Good intentions are not enough.

The criticism (consistent with the one well argued in *No Limits to Learning*) of learning models is clear: they are transmissive (i.e. passive and self-replicating), fragmented into disciplines and micro-disciplines, disconnected from real life and emotions, centred on individualism and utilitarianism, and see nature as a resource rather than a community of life. Ultimately, they are incapable of preparing for an uncertain and complex world, favouring a "maintenance learning" that preserves and perpetuates the system rather than changes it.

The Western-dominant paradigm (rooted in industrial and colonial dynamics) had a profound impact at the highest level on the culture and knowledge of the rest of the world, as well as on power hierarchies.

Readers have certainly appreciated some of the book's comprehensive tables on the serious limitations of this conservative model (even by scientific standards). We invite you to look at them and use them.

It is a matter of working not for a simple course correction but for a reversal of course which, in addition to operating on the ethical, epistemological, pedagogical and cultural level, will also have to enter into the merits of a series of mechanisms that today hinder change and perpetuate the preservation of business as usual (BAU): language barriers, the way of understanding the various disciplines and professions, the criteria around academic careers, the use of technologies not for manipulation and control but to facilitate communication and collaboration.

A paradigm shift

The paradigm that emerges with great coherence from the set of contributions in this book can be summarised as follows:

- Learning changes who we are, not just what we know.
- It involves body, emotions, relationships, emotionality, integrating inner and outer dimensions: thanks to learning, the idea and practice of sustainability become "embodied."
- It relates human beings with other humans, with the territory, with the more-than-human world (ecosystems, other living species, landscape).
- It enhances and integrates various knowledges, various practices and various approaches: Indigenous, spiritual, religious, experiential.
- Learning draws nourishment from the experiences of local communities and, in turn, aims to make them more cohesive, more ecologically responsible and more empowered masters of their own destinies. This learning does not perpetuate a their mastery as an autonomous unit indifferent to the fate of others (or, as often happens, even hostile to communities with different customs, culture, faith or language) but as a unit aware of the common belonging to the human species and the commonality of destiny on and of planet Earth. Communities (understood therefore not as self-referential, closed and identitarian groups) can be forms of democratic social organisation that take care of the "commons" through commonality paths, which are, first of all, educational and collective learning.
- Thanks to its anchoring to living systems, learning suggests the way to reconcile ancestral knowledge and a critical and relational use of modern sciences and technologies. Science is doubt, not dogma; it is uncertainty, not blind faith in steady progress. Technology is not the solution to all the ills that it has caused. The latter is a topic that will require further study considering the now-pervasive spread of artificial intelligence, which is not an "intelligence" but an exponential increase in computing power and in the ability of electronic processing machines to organise data in response to user-posed questions. Artificial intelligence should be seen as a tool to be used, not to replace humans, but to enhance collaboration, mutual learning and creativity.

How can all this be translated into educational practice, into transformative learning? The contributions we have read avoid the choice between techno-optimism and technophobia and are not anti-intellectual or unresponsive to Western science

acquisitions: they propose values (care, repair), educational strategies (e.g. practical ecology, place-based learning, community projects, school as a living laboratory, regenerative agriculture), and indicate, as a way to "opening mindsets," the centrality of art, narration, inventiveness. Storytelling, the realisation of performances, and the use of games and symbols recur in this book's texts as tools for connection, reflection and the activation of a transformative imagination. Emotions (even those that can be upsetting) are signs of inner alignment or misalignment, engines of reflection and spaces for openness to the new and the unexpected. So, the case studies remind us that the human gap is not a lack of data and information (which we have in abundance) but rather a lack of empathy and whole involvement in the destiny of Earth and humankind. It is a gap in imagination, relationship and ethics: the educational task is precisely to open mindsets and cultivate hope. The case studies demonstrate that methods and pedagogical principles are not a utopia but exist and work.

A systemic transformation

The pedagogical indications we have found are often already known. What distinguishes them is quantitative (their presence in all geographical regions), but above all qualitative, because they presuppose a new vision of the world and a more conscious purpose: the attitude towards the living world and future generations changes profoundly compared to the past; personal and collective agency becomes an end and not a means; leadership is no longer reserved for a privileged few but is shared. Communities open up to the other and to the different, becoming engines of change and not brakes at the service of conservation, misoneism, chauvinism, xenophobia. In the regions that have suffered the rape of colonisation, we find the way to free ourselves from the "legacy" of white and Western domination.

All forms of human intelligence are valued, along with other intelligences: the intelligence of the planet, that of animals and that of plants.

Territories find stimuli for regeneration; the protagonism of young people is put into practice rather than declared in words; institutions are reimagined; and the resilience of communities is not a return to the previous state but an advance towards a better structure.

We could say, using the lexicon of Aurelio Peccei and the *No Limits to Learning* report, that the model emerging from the book's various chapters is truly "participatory" and "anticipatory." It is participatory because, thanks to a shift in the purpose of learning and an epistemological reorientation of knowledge, it pushes towards action and tears down the boundaries among learners, teachers and communities.

It is anticipatory because it enables us to meet the polycrisis demands for inseparable ecological and social regeneration.

This model has a further crucial characteristic: it is a systemic, or rather, ecosystemic system.

Stopping, however, here, at the observation that change is possible, would be comforting and wrong. We must therefore continue to interrogate the texts collected in *Constellations of Hope* and connect them to all the other products of the learning initiative launched by The Fifth Element programme of the Club of Rome together with the WEEC Network, because the mosaic is made up of many tiles. The challenge, in fact, is nothing less than that of a revolution in the world's educational systems. On the one hand, as we have repeatedly pointed out, the case studies and best practices presented here warm our hearts. On the other hand, there is still an unequal educational exchange between the North and the global South (the North learns little from the South and claims, indeed, to impose its own values and interpretative schemes), and the numerous ideas offered by this volume do not translate into a choral movement of integral reorientation. The challenge that remains open, in short, is the demolition of the ancien régime (still strong and aggressive, now appearing in the futuristic, sci-fi guise of digital domination and space conquest), of the linear, anthropocentric paradigm of the industrial age. The Anthropocene has produced a general anthropological mutation, and now it is a matter, to open the way to hope, of producing an inverse one, not 180° towards the lost past, but in a third direction.

The unanswered questions

Obviously, many questions remain unanswered, and we will briefly list them.

- Sensitivity to the issues raised by ecology, scientific environmentalism and political ecology is growing everywhere. Unfortunately, it grows thanks to evidence of its validity: data on climate, the sixth mass extinction, armed conflicts, international tensions and social inequalities confirm what is, in short, now commonly called "polycrisis." Why, then, does humanity continue its race towards the abyss that opens before it? Why so much resistance to change, both in many people and, of course, in political and economic powers? And, in the face of resistance to change, what is the most appropriate tactic? Compromise, mediation, gradualness? Or rather radicality? Is there too much politics, or rather too little, in educational discourse? The authors of this book lean towards radicality: adjectives such as "radical" and "critical" recur hundreds of times, often associated with significant nouns ("learning,"

"thinking," "reflections," "approach," etc.).

- Leaving aside the analysis of socio-economic causes underlying the gap between rhetoric and practice, we can highlight here some of the constraints on transformative education well documented by the authors. The first is the dissonance between the different principles often touted by the authorities responsible for educational systems, guidelines and programmes. The promotion of knowledge and critical thinking is formally honoured, and the orientation towards sustainability is often emphasised. Still, the basic paradigm remains (as mentioned above) that of maintaining "business as usual"; from a scientific and pedagogical perspective, it remains reductionist and determinist, anthropocentric and unlimited growth-oriented and hierarchical and transmissive.
- It is therefore also necessary to reflect on language, including the one we use: what is meant by terms such as "skills" (individual but also collective), "innovation," "sustainability," "empowerment" and many others? What is the difference between the concept of "innovation" as it is understood (and desired) in official documents (mainly oriented towards economic competitiveness and unlimited growth, in a purely corporate key) and in the texts of an education aimed at the liberation of the oppressed, social and environmental justice and reconciliation with all natural elements? What skills are indicated in official documents? Do we also risk using terms such as "change," "innovation," "sustainable development" and "transformation" superficially and indifferently (in a cocktail, naive and unconscious, with contrasting flavours)? Does the circular economy, fashionable today, get along with "systemic"? Isn't public discourse too full (intolerably) of clichés and lazy and uncritical assumptions?
- How to give a universal value to the model that emerges from the book, considering the diversity of contexts (from privileged ones that live in a certain security to those in which people have to flee armed gangs, drought or floods, poverty and endemic diseases) and the variability of ecological knowledge from place to place. The differences between largely human-made countries and lands where Indigenous communities resist? And how can they be made effective both in societies characterised by aging and demographic crisis and in those rich in young people? Or in the metropolises (crowded and unequal in both the Global North and the Global South), as well as in inland, marginal and mountainous areas? How can local and traditional knowledge be integrated where, in some cases, it is eroded by the illusory charm of consumerism?
- This last point leads us to another question: Do we absorb the dominant

paradigm or do we resist? How great is the "corruptive" power of the capitalist model on consciences, knowledge, will and the capacity for rebellion? Does learning enable us to resist the magnetism of a model based on competitiveness, growth and the desire for enrichment?

- Finally, if one side of the "learning" coin is the face of rulers and legislators, the other is that of teacher training. What is taught to teachers, university professors and educators all over the world? If institutions teach the wrong things or ignore the right things, civil society organisations must work to remedy them.

A series of answers to uncomfortable questions

These are uncomfortable questions, but the texts published here (both the case studies and the more theoretical texts) converge on certain answers:

- The critique of Western cosmology, epistemology and pedagogy and of the fallacies of the dominant system, is clear. Half-measures or technocratic mythologies will not fill the human gap.
- In the learning process that emerges, there is a word that is spelt "empowerment" but read "depowerment": emancipation from existing structures of power. The educational process must be a "capacitation": its outlet is "agency."
- In all the contributions there are, in a more or less explicit form, approaches and values to be strengthened or introduced if absent, such as the critical perspective, social and environmental justice, peace, gender equality and the emotional dimension that allows us, observes an author, to "fall in love" with socio-environmental problems.
- The most crucial point, the great cognitive challenge, is the culture-nature nexus, which all the authors highlight. They address the problem of incorporating elements of the pre-industrial era into the contemporary world convincingly and coherently. They avoid the risk of "countercultural" proposals,, and anchor the relationship in an anti-anthropocentric paradigm. The word "climate" would be enough to remind us of the common human condition and the interdependent relationships of belonging between the species "sapiens" and nature.

A pedagogy of hope

The mass of experiences and ideas contained in this book, in short, tells us that the appeal of No Limits to Hope has been successful: it gives us the answer to the question that arises when the bleak data of the polycrisis are presented: "It can be done!" It can be done because people do it everywhere on the planet, and seeing it motivates us to act. The gap between knowledge and the capacity to act can be bridged. Between pessimism and hope, the latter can be the pillar of a "pedagogy of hope": not consolation, but an educational and political method for inhabiting uncertainty, daring to imagine future "others," creating new possibilities and practising care for the world and humanity.

Of course, there is still a long way to go, and we will have to travel it with the help of additional compasses.

Power, like a tempting devil, whispers in our ear that "there is no alternative" (and that if you resign yourself, he will give you something), but this is the discourse of a deterministic and linear model. Hope, meanwhile, arises from the same epistemic model that speaks to us of complexity: possible, or even probable, dystopian scenarios are not inevitable.

One author hinted at this contrast between action and pessimism, quoting, perhaps unintentionally, the title of a 2012 Rolling Stones song: "Doom and Gloom."

I had a nightmare, the lyrics say. I was flying a plane and the passengers "were drunk and insane" and "all I hear is doom and gloom." The "darkness" is explained by the song's lyrics and, more so, by the video that accompanies it: the war, the money, the oil, the garbage dumps and the homeless poor.

So, let's get busy and active: "prime the pump," says the song.

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