**INDEPENDENT SOCIAL
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Climate Education

Bulletin 29

Edited by Dr Lars Cornelissen

Climate Education

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EDITORIAL

Dr Lars Cornelissen

ISRF Academic Editor

This issue of the Bulletin brings together seven papers that were presented at the ISRF's last annual conference, held in Bologna, Italy, in November 2023. The conference thematic was **Climate Crisis, Global Capitalism, and Higher Education**.

The papers in this issue look in particular at how the first and third of these themes intersect: what role do higher education institutions have in making a green transition thinkable, achievable, desirable? How are the flaws of our higher education system preventing this work from taking place? And how can critical pedagogies help push back against climate scepticism, pessimism, or defeatism?

The issue opens with an introductory piece by the ISRF's Director of Research, Christopher Newfield. Reflecting back on the Bologna conference, he draws together some of the main themes and observes that there's a great amount of energy and will among educators to push for change. What needs to be done is to challenge the inertia of those in power and to build new narratives to replace the conventional wisdom that has placed us on a disastrous course.

In her piece, Athena Hadji shares a number of distinct but interrelated thoughts about the way the climate crisis intersects with and reflects the crisis of Humanities knowledge. What the Humanities offer is the

ability to tell stories, old or new, not with the aim to profit or to provide comfort but to reinterpret the world and our place within it so as to prompt change. As the prestige of the Humanities has declined, so has our ability to build critical perspectives. Now, as Hadji concludes, "it is time our voice was heard."

Also focused on pedagogy is Jane Hindley, whose contribution reconstructs her efforts to design a new pedagogical approach to sustainability, one that moves beyond the Sustainable Development Goals and their notable lack of ambition. Taking inspiration from Paolo Freire, Naomi Klein, and the methods developed by the Centre for Alternative Technology, she outlines what a pedagogy looks like that conceives of higher education as site not just of climate study but also climate activism.

In his paper, Eric Kushinga Makombe develops a systematic review of the state of climate research and climate education in Zimbabwe. As he shows, there exists a gap between the Zimbabwean government's stated ambitions in this area and the university sector's ability to meet them. While each of the country's nine universities have ambitious and promising climate programmes in place, a lack of funding and a prioritisation of STEM research to the detriment of HASS approaches has created stark limits that will need to be overcome.

Addressing the theme of ecopedagogy, Sieglinde Lemke takes us through a number of different approaches that have developed within this field over the last half century. While all agree that education is key to achieving a sustainable lifestyle, the question is what such education should look like. For Lemke, education for sustainability will inevitably fail if it limits itself to training individuals qua individuals. Instead, the aim should be to develop a holistic culture of sustainability, in which sustainable values are reflected not just in consumption patterns or individual beliefs but in intersecting ways of acting, thinking, and being.

Eleanor Jupp's paper asks how university researchers can contribute to climate justice in their own local areas. Reporting on a period of fieldwork she completed in an oft-stigmatised and under-resourced area of Chatham, Kent, she talks about the very acute sense local inhabitants have of the issues they face with pollution, poor health, and

bad infrastructure, as well as of the close links between each of these. Talking about her experience working with a visual artist, she holds out that digital technologies are helpful tools in charting these issues and mapping them onto the local environment.

In their paper, Bridget Vincent, Luseadra McKerracher and Janet Rafner discuss a teaching protocol they're developing, called Close Reading Climate Change. They argue that close reading methods help students cope with hugely complex questions by teaching them how to sit with uncertainty, have difficult conversations, and constructively disagree with one another. They argue that critical pedagogy can help us to disentangle some of the vexing issues that surround climate (in)action, including questions of complicity and collective responsibility and draw out a number of concrete insights that point in this direction.

The issue closes with a piece by Emanuele Fantini, who explores the critical uses of podcasting as a research and teaching method in climate questions. Building on the case study of the Italian water movement, which in the early 2010s successfully pushed back against efforts to privatise water access in Italy, he asks what strategic and theoretical lessons we can learn from this experience. He argues that narrative building was key to the movement's success and, on this basis, advocates the use of podcasts in the effort to build student awareness of the importance of narrative, voice, and active listening.

Together, these papers keep up the important work of thinking through and testing climate pedagogies. The broader themes of climate change and the green transition will remain central to the ISRF's agenda going forward. In October 2024, the Foundation is hosting its next annual conference on the theme of **Migration and Democracy in a Time of Climate Crisis**, where we will continue this conversation.

CONFRONTING THE KNOWLEDGE CRISIS

Professor Christopher Newfield

ISRF Director of Research

C an we teach effective opposition to environmental disaster? Can society learn this opposition on a mass scale?

Delegates to our second annual conference in Bologna answered yes. Public awareness and public action could already be found across the world, and there were signs of acceleration. And yet they also chronicled the policy decisions that overall do not reflect that awareness, but fell into the familiar pattern of "too little too late."

The pandemic seemed for many of us like an interruption in this "too little" business as usual, one big enough to put a bend in history. The Intergovernmental Panel on Climate Change's 6th Assessment Report was published in 2021, again proving the need for massive, immediate climate action. As it came out, we were all seeing what a real response to it might produce—thanks to the pandemic rather than to climate action. The skies over North America were almost empty of jet trails. The Los Angeles freeways I grew up on, normally twelve lanes of cars idling in the sun, were all but abandoned. In higher education, the move of 100% of courses online was an instant global lesson in the

value of teaching face-to-face. Perhaps after decades in which jets replaced long-distance trains, private cars eroded public transit and marketization eroded instruction in Western higher education, we'd discuss proper public funding for all these essential sectors.

In economics, a majority percentage of the public was finally accepting that neoliberalism had failed. Hundreds of millions of people were learning first-hand the transformative power of massive government spending through Covid-19 bailouts, the famous dropping of money from helicopters, only this time dropping it on everyday people rather than on bankers and finance as in 2008-09. There was hesitant movement towards converging support in the three arenas of our conference: capitalism, climate change, and higher education. We could imagine enacting political changes in which reparative economics would replace the Washington Consensus in support of carefully focused and abundant financing of green transitions in low- and medium-income countries. We could imagine eliminating cost barriers to high-quality education across the world. Even some Tory parliamentarians were denouncing the excesses of their own austerity that had hollowed out British society. At times it seemed as though policy had become a zone of possibility rather than prohibition for the various peoples of the world. They would be able to move forward in new directions they preferred.

We need to keep that spirit alive as we think about what we got instead. What we got instead was a political revolt against public spending and the high interest rates to enforce it. What we got was reneging on green transition goals in the UK and a soft-pedalling of them elsewhere. What we got was no new public money in higher education. What we also got, locking the others in, was war. In 2022 Russia invaded Ukraine, and an old-school land war of tanks and artillery, supplemented by drones, seems set to become quasi-permanent, with massive environmental waste and damage on top of loss of life and destruction of the physical systems for life. In October 2023, Israel responded to the Hamas incursion of October 7th, and the killing of civilians, with an invasion of Gaza. The war started three weeks before our conference in Bologna, and six months later it continues in spite of a wide range of protests, legal efforts, and multilateral diplomatic manoeuvring. Another war

continues in Sudan, where 16,000 people have been killed as of this writing.

War strategy is completely unacceptable, and yet this is what is happening—driving out coordinated international work on the enormously difficult challenges of the green transition, universal higher education, and a just global economic order. It was almost as though the discovery that constructive cooperation was both possible and popular caused a nervous breakdown in the political and financial classes and a return to the pursuit of disorder.

One of the ISRF's slogans is "new thinking for real-world problems," and the starting point of new thinking is militant clarity about what we face. A second starting point is to believe in the ability of research to contest, redirect, and rebuild power systems into much better forms than we currently have. The work of scholarship has a power that is always there, always waiting to be used. Scholarship is capable of creating what the Italian operaismo tradition calls countersubjectivity, which reverses common sense and gradually but fundamentally overturns and rewrites the rules of the world system.

A number of themes ran through the conference and through the papers collected here. One was putting the Global South front and centre in our intersecting dimensions of economics, education, and climate.

A second was dissatisfaction with the current state of universities in all of the countries represented by the delegates. They seemed to be struggling to fulfil their intellectual missions as much as they struggled with their social roles. Many papers imagined higher learning moving off of traditional campuses as well as pedagogical transformations on existing ones.

A similar dissatisfaction was expressed with top-level governmental and economic actors. These often lagged behind the general awareness of burning issues rather than leading them. Our third theme was the flip side—an implicit tribute to the power of people's reflections on their everyday existence and experience, and the general capacity to learn continuously and rapidly from it.

Fourth, I was impressed by the papers' demonstration of the power of analysis to see into technical systems, whether these be earth climate systems, or emissions accounting for corporations with dozens and dozens of divisions, or the dynamics of undergraduate classroom discussion. Analysis worked throughout the conference as a counterpower that points directly towards other, better possibilities.

Some delegates stressed a fifth issue, and that is the power of new narratives to replace conventional wisdom with new assumptions. The ISRF is generally committed to pulling together the research of our Fellows into larger story arcs that can help their ideas work their way from states of novelty into general awareness. A sixth issue is the way this process of renarrating our current assumptions involves agonism, antagonism, struggle, and conflict in research. Allowing and sustaining these necessary intellectual antagonisms is the core function of academic freedom. Academic freedom is at risk around the world and is very much in need of expanded public explanation.

Finally, a number of delegates stressed the power of self-valorisation in both education and activism. By this they meant not simply the increase in individual capabilities through higher education over time, but a process through which the individual learns how to value the learning process through which capabilities are created, and how to direct it, explain it, and connect the resulting capabilities to actions with others. Self-valorisation offers the individual a thought-based personal agency they otherwise lack. This agency can operate across political, cultural, and conceptual differences and gives the individual an ability to think autonomously in relation to the coercive forces emanating from the crises of the word. Research and engagement each take large amounts of focus, energy, and thinking, and this mastery of one's own intellectual agency is important at every point of the process.

I left the conference with the sense that as bad as world problems are, we are in fact collectively up to the job of fixing them. Indeed we've already fixed many of them in theory—the conference was another step in that process. A challenge that remains is getting the delegates' ideas put into wider use.

PYGMALION'S (DE)FEAT

Climate Crisis and the Humanities as Pedagogy

Dr Athena Hadji

"Once upon a time, in the undefined and non-definite time of Greek myth, there was a man with an inflated ego. He was a primeval creature, all Darkness and Chaos, before logos emerged in Greek recorded thought and culture; his name was Tantalus. Tantalus was an associate of the Gods and they invited him to a banquet. He was so full of himself that he decided to trick the Gods into treating them with parts of his dismembered son, Pelops. Trigger warning! The Gods, being omniscient, certainly refused the offer, with the exception of earth goddess Demeter, who was distraught, as she was mourning the loss of her precious daughter, Persephone. Demeter ate part of the shoulder of poor Pelops, before she realized what her snack was. Once she realized exactly what she had eaten, she had him re-assembled, brought to life, and given an ivory shoulder."

What I just narrated, a Greek would describe as an atrocious act of hubris—which, as the Greek worldview mandated, inevitably led to nemesis, a divine intervention, in a cruel form, rest assured, for the restoration of the cosmos, the universal order. Tantalus was the first in a genealogy of bloodshed, revenge, Freudian complexes and troubled minds, in the likes of Pelops himself, and Agamemnon and his tortured children, and nemesis came to him as eternal condemnation.

An alternative title for this paper would be "Random (?) thoughts of a humanist who happens to be a Humanities Professor". In other words, both climate crisis and the devaluation of Humanities education are the product of inflated egos, combined with an utter lack of empathy. Humility is etymologically related to Humanities, ultimately leading us to homo (namely human) and humus, that is earth. What I did earlier is tell a story, employing myth, *mythos*, literally a word or a combination thereof. Stories, textual and visual narratives, teach critical thinking and cultivate imagination and creativity. Stories also teach lessons, lessons that seem to have been forgotten or de-prioritized, as has the Humanities as a field in toto. Humanities education has been marginalized and its many lessons reduced to pastime with zero practical, i.e. tangible value: "[d]emocracy is built upon respect and concern, and these in turn are built upon the ability to see other people as human beings, not simply as objects", in the words of Martha Nussbaum.[1]

Random thought no. 1: midterm evaluations for my Greek Sculpture course that I read two days before today's talk.
Question: "what would you change in the course?"
Student answer:
"No readings."

A training in the disciplines of the past offers surprisingly unsurprising insights, such as: archaeology teaches us that climate crises always happened, and always wreaked havoc in human lives, especially when the latter thought a bit too much of themselves (case in point, catastrophic episodes in later prehistory that contributed greatly to the collapse of the great palatial systems in the Aegean). There is a crucial difference today, of course, and this leads to the addition to the geological nomenclature of the dreaded A-word: *Anthropocene* as the product and consequence of an ego- (and not at all anthropo-) centric view of life. Inflated egos abound in neoliberal capitalist cultures and the prevailing understanding of the environment or the earth or nature as distinct from humans and existing only as resources for humans is a manifestation of this difference: the anthropogenic climate crisis that leads, as of late with terrifying frequency, to a planet hostile to humans

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1.   Martha Nussbaum, *Not for Profit: Why Democracy Needs the Humanities* (Princeton, NJ 2010: Princeton University Press), 6.

and a truly unsustainable life. Furthermore, a comparative approach never hurt anybody. The era of the mega-, from the mega-rich to mega-cities, the latter overflowing with humans on the opposite side of the wealth spectrum, has a lot to learn from comparison. Mostly, that humans come, live and then they die, regardless.

Random thought no. 2: A peculiar case of an affluent middle-aged man who, of his own volition, is undergoing an inhuman and very environmentally unsustainable effort to stall time and cheat death made the news recently. One wonders: does it ever cross the aforementioned man's mind that he too shall die? That there are billions (eight and counting) of biological entities out there with the exact same neurobiological capacities and potential of the *Homo Sapiens Sapiens* species? This is oddly reminiscent of the mythical king of Lydia, Midas, whose greediness resulted in him being unable to touch anything lest it turned into gold and thus starving himself. One wonders if an education in the Humanities would have taught both of these men some humility.

In theory, humanity in the 21st century is making historically significant progress and has at its collective disposal seemingly endless possibilities (albeit with a specific geographic distribution). In reality, the Midas touch premise is in full force, with the exception that we turn everything we touch into garbage. Trash is found everywhere, from space to human milk. Hubris lies in the heart of the Anthropocene. Is the Anthropocene the nemesis of humanity?

Random thought no. 3: a humanoid that could not stand and the contribution of a semester-long course in Greek Sculpture or the hubris that is to make a humanoid without considering the human body. In other words, a highly intelligent artificial entity that cannot stand because its measurements and proportions are all wrong, or an obvious, practical, and somewhat embarrassing example of a tree and forest situation. The thirst for technological advancement, the same thirst that drove the very first technologies humankind employed hundreds of thousands of years ago, is such that it can obscure basic facts, such as the human body. It was to my astonishment that toward the end of Spring Semester 2023 during a casual chat at my office my student Shivani informed me about an unexpected side benefit

of familiarizing herself with Greek Sculpture. Her lab was working on a humanoid, AI-sophistication and all, but they had some seemingly unsolvable structural issues. Class discussions, an understanding of contrapposto, the basic pelvic tilt that enables prolonged standing with one leg bearing the weight and one free leg, repeated posing in aforementioned position in order to physically understand the concept, and an abundance of examples of structurally sound sculpted ancient bodies gave her the knowledge to suggest working with its proportions, until they got it right in a "eureka!" moment. This is a tiny, but fundamental thing that a course in Greek Sculpture did for a student of AI-focused cognition.

I have been trained in the Humanities all my life, in fact I was about 12 when the *accidental* reading of a poem by celebrated Greek poet George Seferis shifted, as I like to tell my students, "something small but fundamental in me". In (re)turn, I have been training humans in Humanities education (literary, material, artistic) for the past 15 years or so in numerous capacities, through multiple disciplinary channels, with an emphasis on the inter-disciplinary.

Random thought no. 4: Young climate activists who vandalize art in museums or how a lack of critical thinking leads to mistaking action for pointless, serious and costly damage. The great texts teach us lessons in humility, tolerance, resilience, empathy and sympathy. The study of great art teaches us respect for the human endeavour. Anthropos is at the centre of their inquiry as a tiny but fundamental particle of the universe.

Random thought no. 5: in summer 2023, Ghanian art collective *The Nest* established their site-(semi)specific installation *Return to Sender* at the Stavros Niarchos Foundation Cultural Center (SNFCC) in Athens, a sustainability-conscious architectural complex, work of starchitect Renzo Piano. The work, curated by the Director of the National Museum of Contemporary Art (EMST) in Athens, Katerina Gregos, comprised a tin-roof hut, with walls made of piles of used and discarded clothes. I took two classes of contemporary art courses there. In both instances, students were astonished by and ashamed of their fast fashion unsustainable choices, as well as completely unaware of the problem and their contribution to it.

What does a Humanities education have to offer in the current situation? Well, the kind of education offered in the field of Humanities is about creating worldviews, rather than *directly* profiting from what one learns in monetary terms. What we do: we tell stories. Happy stories and dark stories. Indeed, stories with a beginning, middle and end. Textual stories and visual stories. Can stories change the world? Can a good story disrupt the disruptions caused by greedy inflated egos? Humanities teach us how to read critically; how to assess a text and look for arguments and construct arguments of our own; how to read an image; how to tell fake from real news; how to dissect information; telling truths from truisms.

Random thought no. 6: In 2014, President Obama delivered the infamous "I promise you, folks can make a lot more, potentially, with skilled manufacturing or the trades than they might with an art-history degree", continuing to say he did not, of course, wish to cause a stream of protest emails pouring in. Still, Art History Professor Ann Collins Johns did send *that* email to the White House, not in protest, but in order to highlight the value of an education in the arts.

John Dewey wrote that "the main effect of education [is] the achieving of a life of rich significance".[2] Mythos originally means word and words signify. We ravel words, we embroider texts. With power. To change. We do not provide comfort. We are not auxiliary. We dig deep into the core of being human. And it is time our voice was heard.

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2.   John Dewey, *Democracy and Education: An Introduction to the Philosophy of Education* (New York 1944 [1916]: The Free Press), 236.

BEYOND THE SUSTAINABLE DEVELOPMENT GOALS

A Freireian Approach to Education for Sustainability in Higher Education

Dr Jane Hindley[1]

Education either functions as an instrument which is used to facilitate the integration of the younger generation into the logic of the present system and bring about conformity to it, or it becomes the practice of freedom, the means by which men and women deal critically and creatively with their reality and discover how to participate in the transformation of their world.

—Richard Schaull, 1972[2]

[The Sustainable Development G]oals are not only a missed opportunity, they are actively dangerous: they lock in the global development agenda for the next 15 years around a failing economic model that requires urgent and deep structural changes, and they kick the hard challenge of real transformation down the road for the next generation to deal with — by which time it may be too late.

—Jason Hickel, 2015[3]

We found few new policies, institutions or budget allocations designed to further specific goals. Did any government change its laws to achieve the many intersecting transformations envisioned by the SDGs? Did any ministry in those governments create new programmes for implementing the SDGs? If so, there is little evidence of it. What we found instead are changes in discourse. Those in power now refer to the SDGs often. Yet the way they govern has not changed.

–Frank Biermann, 2022[4]

Introduction

In July 2023, the UN announced that the 17 Sustainable Development Goals (SDGs) were failing and called on states to step up efforts to ensure that they would be achieved by 2030.[5] Two months later, the failure of the SDGs was corroborated by the findings of an independent evaluation published in *Nature*.[6] The fact that few states are on track to achieve the SDGs is no surprise given the grim dominance of neoliberalism, which continues to generate poverty, inequality and environmental damage. As Hickel wrote at the time of their launch, the SDGs were a substitute for genuine reforms and a transition to a new political economic model that will tackle the climate emergency.[7] Moreover, even in 2015 the SDGs were widely criticised, not only by radicals like Hickel, but also by experts and non-governmental actors as diverse as *The Economist* and the Gates Foundation. The weakness

4.   Frank Biermann, "UN Sustainable Development Goals Failing to Have Meaningful Impact, Our Research Warns," *The Conversation*, June 2022, available at https://theconversation.com/un-sustainable-development-goals-failing-to-have-meaningful-impact-our-research-warns-185269.

5.   UN Department of Social and Economic Affairs, "World risks big misses across the Sustainable Development Goals unless measures to accelerate implementation are taken, UN warns," July 2023, available at https://www.un.org/en/desa/world-risks-big-misses-across-sustainable-development-goals-unless-measures-accelerate; United Nations, The Sustainable Development Report 2023: Special Edition (2023), available at https://unstats.un.org/sdgs/report/2023/?.

6.   Shirin Malekpour et al., "What scientists need to do to accelerate progress on the SDGs," *Nature* 621, no. 7978 (2023): 250-254. This evaluation was commissioned by the UN.

7.   Hickel, "Five Reasons."

of the SDGs as tools for tackling the realities of the climate, ecological and social crisis not only reinforces the urgency of the "deep structural changes" that Hickel calls for. It also calls into question the central position these goals have recently come to occupy in mainstream approaches to climate and sustainability in higher education. As Biermann found in his systematic review,[8] SDG talk has has proliferated across all sectors—and universities are no exception.

This short article starts by briefly critiquing the centrality of the SDGs in UNESCO's most recent approach to climate and sustainability education. I focus on their 2020 report, *Education for Sustainability: A Roadmap* (ESD 2030), which has been influential in shaping national higher education frameworks and university teaching.[9] After highlighting the problems of ESD 2030, I then move on to discuss an alternative approach I developed ten years ago and have used ever since. This approach draws on my background in comparative political sociology, and early career research on social movements and regime transitions. However, as I explain, it was specifically inspired by the work of Paolo Freire, the Centre for Alternative Technology, and Naomi Klein. In the final section, I give examples of how I have used this approach to structure modules, short courses and public talks. Obviously, this is one of many ways to approach Education for Sustainability (EfS); but it may be useful to colleagues who wish to move beyond the contradictions and constraints evident in approaches founded on "sustainable development".

1. The SDGS and UNESCO's Approach to Education for Sustainable Development (ESD)

Since the early 2000s when they launched the UN Decade for Education for Sustainable Development (2005-14), UNESCO has undoubtedly played a vital role in raising the profile of sustainability education. Their successive reports, guidance, and resources have

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8.　　Biermann, "UN Sustainable Development Goals." Biermann and his team reviewed over 3,000 articles related to the SDGs.
9.　　UNESCO, *Education for Sustainable Development: A Roadmap* (Paris 2020: UNESCO). Available at: https://unesdoc.unesco.org/ark:/48223/pf0000374802.

Figure 1: The UN Sustainable Development Goals & ESD Competences.

generated debate and encouraged new norms around integrating climate and sustainability into national education policies, teacher training, and the ethos, operations and curricula of schools and universities. Until 2020, UNESCO's ESD approach can be summed up as combining two main features. The first was a conception of sustainable development founded on the supposedly complementary "three pillars", the economic, environmental and social. This conception dates back to the 1987 Bruntland report and has become a standard feature of sustainability textbooks. The second feature draws on a more radical educational tradition that ultimately dates back to John Dewey and is exemplified by the EfS approach advocated by Stephen Stirling.[10] This is the emphasis on active, dialogic, and experiential pedagogies aimed at enhancing students' ESD competences (see figure 1) and capacity to become sustainable development advocates.

UNESCO's 2020 report *Education for Sustainability: A Roadmap* (ESD 2030) maintains the emphasis on active pedagogies and competences. But it marks a shift away from the three-pillar conception and a wholesale adoption of the SDGs as core content and framework for ESD teaching. The report claims with almost missionary zeal that ESD can become an enabler for achieving the SDGs because it "raises awareness of the 17 goals", promotes "critical and contextualized

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10.　　See, for example, Stephen Stirling, *Sustainable Education: Re-visioning Learning and Change* (Dartington 2001: Schumacher Society). This was the "manifesto" that shaped his subsequent publications.

understanding of the SDGs", and "mobilizes action towards [their] achievement".[11] This report has been highly influential. In the UK, for example, following its publication, the SDGs were incorporated into the higher education Quality Assurance Agency's 2021 Education for Sustainable Development Guidance, and they are also promoted by Students Organising for Sustainability, an offshoot of the National Union of Students. Additionally, the SDGs are increasingly used in universities as metrics for measuring institutional progress in integrating climate and sustainability education, as well as a framework in teaching.

At first glance, this all seems commendable. After all, the goals have laudable aims and who can disagree with ending poverty, tackling climate change, or providing clean and affordable energy? But there are numerous problems with fetishizing the SDGs in this way. Most notably, the SDG grid (or wheel) operates as a sort of pious palimpsest that obscures the destructive dynamics of neoliberal capitalism and the realities of power. As such, it diverts teachers' and students' attention away from analyzing these dynamics and the need for systemic reform and a just transition. Moreover, the underlying conception of the SDGs maintains the simplistic fiction evident in official sustainable development discourse since the Brundtland report. This is the fiction that economic growth (SDG 8, which Biermann notes is often cited by multinationals to justify their operations) can be combined with climate and ecological action. Another serious problem is that climate action is very low on the list, at SDG13, and is just one of the seventeen goals. This dilutes the gravity of global warming and defuses the urgency of radical emissions reductions. Finally, at an institutional level, because the SDG grid covers so many issues, it enables universities to claim a commitment to sustainability by adopting a tick-box approach to mapping existing teaching without actually reforming the curriculum in any serious way.

There are many ways that using active pedagogies in teaching can mitigate some of these (and other problems) with the SDG-centred ESD approach. Nonetheless, the increasing dominance of this approach should cause alarm. The way SDG talk is permeating higher education is effectively socializing young people into a technocratic discourse

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11.   UNESCO, *Education for Sustainable Development*, 22.

and way of thinking that has been shown to be inadequate. Moreover, the power of this legitimating discourse is such that it continues to entangle even the experts who have demonstrated the SDGs' failures. Despite his findings of all talk and no action, Biermann, for example, cannot bring himself to suggest substantial reforms, calling instead on "civil society and social movements to prick the bubble of SDG talk".[12] The recommendations of the 2023 independent SDG review panel are even weaker, as the title and strapline of their Nature article show: "What scientists need to do to accelerate progress on the SDGs. Drilling down into why the UN Sustainable Development Goals are so hard to achieve will help the planet and save lives."[13] Notably, neither set of experts even mention neoliberalism, never mind the critiques that have been around for at least eight years. It is in this context that more radical approaches to sustainability education, which foreground neoliberalism and climate-ecological crisis, are urgently needed.

2. Developing an Education for Sustainability (EfS) Approach: Three Sources of Inspiration

The EfS approach I developed between 2012 and 2014 was motivated by several converging factors. The first was the epiphany I experienced during a seminar by climate scientist Kevin Anderson in 2007. Until then, like most people in the UK at the time, I knew little about global warming. But I left that seminar in no doubt about the gravity of climate change and the urgency of emissions reductions and a zero-carbon transition. It was also a catalyst for refocusing my research on UK climate policies and grassroots sustainability initiatives. The second factor was the realisation that there were serious gaps in students' interests and the wider curriculum. My interdisciplinary studies students invariably chose dissertation topics relating to social justice, but showed little concern for environmental issues; and none of the few environmental modules scattered across departments focused squarely on climate change or sustainable solutions. The third factor was the shift in UK public debate around climate change after 2010.[14] Whereas there had been a cross-party consensus around New

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12.　Biermann, "UN Sustainable Development Goals."
13.　Malekpour et al., "What scientists need to do."
14.　There had been some important action on climate change under

Labour climate initiatives between 2006-10, this quickly broke down when the Liberal Democrat-Conservative Coalition took office. The Coalition not only brought in a host of "austerity" policies cutting public services and social benefits. Chancellor Osborne also cut a swathe of carbon-reduction policies and sustainability initiatives, reframing them as "green taxes" and thereby amplifying and legitimating climate sceptic discourses.

In this context, it seemed increasingly urgent to get climate and sustainability modules into the curriculum. The challenge was: what could I actually teach? When I began looking around, it became clear that colleagues elsewhere were also grappling with this issue. The Higher Education Academy, the national body for sharing best practice, for example, had set up the Green Academy in 2008 to help develop teaching in this area. But most of the pilots seemed related to more vocational degrees, so although I noted the common use of active pedagogies, they were of little help conceptually. That's when I started reflecting on the lessons from my research and teaching on the role of education and social movements in transitions from authoritarian rule to neoliberal democracy in Latin America and Taiwan. These reflections led me back to Paolo Freire – whose pedagogies had been crucial to grassroots literacy campaigns and popular mobilisation in Latin American transitions and also influenced the education reform movement that played an important role in the transition from military rule in Taiwan.[15]

In his 1968 classic *Pedagogy of the Oppressed*, Freire outlines the core principles that underpinned his life's work. He starts from a critique of dominant transmission and "banking" pedagogies, based on a standardised, top-down curriculum, rote learning and authoritarian relations between teachers and students, which he views as legitimising and inducing conformity with the status quo. He proposes instead that

New Labour between 2006 and 2010, including the Climate Change Act and support for grassroots sustainability initiatives. But their plans to scale up carbon-reduction and sustainability initiatives, launch a public education campaign and to integrate climate and sustainability into the national curriculum were dropped by the Coalition.

15.　　Ming-sho Ho & Jane Hindley, "The Humanist Challenge in Taiwan's Education: Liberation, Social Justice and Ecology," *Capitalism Nature Socialism* 22 no. 1 (2011): 76–94.

"revolutionaries" start where students are and investigate how they are conditioned by dominant ideologies, relations of power and material realities. This is a call to humility regarding the very real oppression and educational marginalization suffered by the poor in Latin America at the time. It is also crucial for establishing a baseline for the next phase: consciousness-raising, which is grounded in the principles of "denounce" through critique and "announce" possibilities for change and action. In contrast to transmission methods in which teachers tell and expect students to absorb, in the process of consciousness-raising teachers work in more horizontal, dialogic ways to enable students to reflect on, read, and name the world and thereby become actors able to exercise voice in politics and society.

I had always admired Freire's work. But these principles took on a new relevance in relation to the neoliberalization of education in the UK. This process was still incomplete in universities ten years ago. But it was alarmingly clear in schools – evident in institutionalized competition, teaching to the test, and reduced spaces for teachers and students to exercise creativity and autonomy. Moreover, the impact of neoliberal conditioning was becoming discernible in the orientations, values and practices of students arriving at university. In this context, my concern about students' lack of environmental knowledge was compounded by the sense that due to their conditioning new cohorts were increasingly ill-equipped to think beyond the status quo and tackle the challenge of climate change. Re-reading Freire strengthened my conviction about the urgency of getting climate into the curriculum and made me reflect on how to address the neoliberal common-sense I was hearing in classes. It was also a catalyst for reconceiving education in the UK as a site of climate activism and reorienting my stance from researching/teaching *about* transitions to researching/teaching *for* a transition. However, whereas critique and active pedagogies were central to my teaching, I was less sure how to "announce" the possibilities for change. It was here that a second, complementary source of inspiration was very important.

This second source of inspiration came from the practical, solutions-oriented research and pedagogies developed by the Centre for Alternative Technology (CAT), a pioneer of sustainable innovation and education in the UK since the mid 1970s. I first became aware of

CAT's educational work in 2011-12 when I met several graduates from their MSc programmes who were organising community sustainability initiatives in Bristol.[16] I was impressed by how knowledgeable they were about climate change, different aspects of sustainability, and their high levels of motivation and commitment to social engagement. At the time, I was vaguely familiar with the history of CAT, which was set up as an exemplary sustainable community on the site of a disused quarry in Mid Wales in the context of the oil crisis and growing alarm about peak oil and environmental limits.[17] But the way they had stepped up their research and expanded into formal education since the late 1990s in response to the climate and ecological crisis was a revelation – especially when compared to the incipient state of sustainability education in universities.

CAT's flagship research project, *Zero Carbon Britain* (ZCB), launched in 2007, proved to be crucial. It models the policy changes needed in energy, homes and buildings, transport, food and agriculture for a rapid transition, while exploring "the potential barriers and how they can be overcome". Written for non-specialist readers, the ZCB reports enabled me to grasp the scale and dimensions of the transformations required to transition away from fossil fuel dependency. They are also valuable resources to use in teaching.[18] The pedagogy underpinning

16.   Jane Hindley, "Bristol Green Doors: Promoting Home Energy Retrofitting, Combatting Climate Change," in: S. Böhm, Z. Pervez Bharucha & J. Pretty (eds.), *Ecocultures: Blueprints for Sustainable Communities* (Abingdon 2015: Routledge): 164–179.
17.   As their website recounts, CAT's founders included "engineers, architects, builders and growers" and they gained a lot of media attention when they set up the centre. In the 1970s and 1980s they promoted renewables and low-carbon living through short courses and their visitor centre and their technical initiatives included experiments with solar and wind generation, as well as solar fridges, clean cook-stoves, and low energy buildings. See Centre for alternative Technology, "History," available at: https://cat.org.uk/history-2/.
18.   There have been four main Zero Carbon Britain reports since 2007: *Zero Carbon Britain: An Alternative Energy Strategy* (2007); *Zero Carbon Britain 2030: A New Energy Strategy* (2010); *Zero Carbon Britain: Rethinking the Future* (2013); and *Zero Carbon Britain: Rising to the Climate Emergency* (2019). In tandem with the reports, CAT provides numerous resources on their website and runs training courses and workshops for local authorities and communities.

CAT's MScs, which address subjects like sustainable architecture, urban planning and energy, was equally instructive. These unconventional degrees, with students attending intensive, week-long residential modules spaced over a year or more, are specifically designed to equip graduates to become change-makers and many go on to jobs in local government and NGOs. The ethos is summed up by CAT's motto: "Inspire, Inform, Enable". But the most important pedagogical lesson from interviewing CAT staff and graduates was that sequencing is key (see figure 2). To paraphrase one graduate, they hit you with the hard facts of climate change right at the start of the course and then inspire and motivate you to do something about it by focusing on solutions and by inviting activists who have set up new sustainability initiatives to give guest lectures.

Figure 2
Pedagogical sequencing of Sustainability MScs: Centre for Alternative Technology

- **Hard facts** of the climate and ecological crisis
- **Inspire hope:** macro-level strategies & solutions are feasible (Zero Carbon Britain)
- **Inspire action:** testimonies from activists and social entrepreneurs
- **Experiential learning** at CAT
- **Equip with skills:** project work and dissertations

The third source of inspiration that was helpful in developing an EfS approach was Naomi Klein's 2014 book, *This Changes Everything: Capitalism vs the Climate*.[19] As discussed above, I had tracked the deepening hegemony of neoliberalism since the 1980s and was already aware of the incompatibility between neoliberal orthodoxy and climate action. However, Klein sets this out in a clear, straightforward way that is accessible to students. In Part 1, "Bad Timing", she argues that tackling the climate crisis requires the re-deployment of government subsidies, public investment and incentives, as well as new policy, regulatory, and legal frameworks, based on the precautionary and polluter pays principles. But, as Klein emphasises, just when scientists were raising the alarm about climate change in the late 1980s,

19.   Naomi Klein, *This Changes Everything: Capitalism vs the Climate* (New York 2014: Simon & Schuster).

neoliberals were rolling back the state and promoting libertarian free market policies and de-regulation. Just as significantly, based on her interviews with libertarians and observations of right-wing conferences between 2010 and 2013, Klein stresses that the neoliberal right are not going to give up their hegemony easily. They prefer to live with climate change than allow the state back in and jeopardise the "freedoms" they have achieved.[20] Given these findings, she concludes, calling on neoliberal governments to act decisively to tackle the climate crisis will fail. Instead, it will be up to grassroots social movements to block the expansion of extreme energy and other ecologically damaging projects and form coalitions to push for a just transition and a reconstruction of social democracy that will tackle both the social and environmental crisis.

Put simply, one of the great strengths of *This Changes Everything* is that Klein historicises neoliberalism, challenges the slogan that "there is no alternative", and answers the common-sense question frequently heard at the time it was published: "if climate change is so important, why aren't governments doing anything about it?" Moreover, because she highlights the importance of social movements and alternative political projects in any transition to a zero-carbon society, her work complements CAT's pedagogical approach.

3. Designing EfS Modules and Initiatives

Finding space in an established curriculum for climate and sustainability teaching can be difficult and often involves a lot of lobbying. In the Interdisciplinary Studies Centre where I teach, degrees are organised with a core course in each year and students take options from departments across the social sciences and humanities. So, although my then head of department was sympathetic, resource constraints meant there was little prospect of getting agreement for a new module. The opportunity when it came was in the unlikely guise of employability. This became a compulsory strand of the university curriculum in 2014 in response to government demands for education to serve the labour market and new HE performance metrics. As I

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20.   Ibid., 38–46.

was well aware, this emphasis on employability was indicative of the erosion of humanist values and the increasing instrumentalization of education. Nonetheless, it opened up curriculum space and, paradoxically, provided the creative constraints that enabled me to find a form for the approach I had been mulling over. Figure 3 shows the design of the resulting 15-credit module, CS200 Social Entrepreneurs, Sustainability and Community Action, and how I adapted the insights derived from Freire, CAT and Klein within these constraints.

Figure 3
CS200 Social Entrepreneurs, Sustainability and Community Action

- Introduction to the Co-operative & Social Enterprise Sector
- Changing State-Civil Society Relations & Social Inequalities since 1945
- Neoliberalism, the Climate-Biodiversity Crisis & Emerging Paradigms for Change (e.g. ZCB, Green New Deal, Degrowth, Circular Economy)
- Co-operatives (Guest Talk + Mondragon & other cases)
- Organizations Acting for Sustainability: Group Case Study Research & Presentations (e.g. Woodland Trust, SUSTRANS, Low Carbon Hub, CAT, etc.)
- Alternative Wealth Creation in Local Economies: the Cleveland/ Preston Model
- Mutual Self-Help & Learning from Models of Good Practice
- Identifying Needs, Sources of Funding & Project Design
- Becoming a Social Entrepreneur
- Group Tutorials: Ideas for Final Sustainability/ Social Project or Social Enterprise
- Final Workshop: (Draft) Project Presentations

ASSESSMENTS: 1. Group research & case study presentation; 2. Reflective Essay; 3. CV & Application for Internship; 4 Individual Project Presentation; 5. Written Project Proposal: Small-scale Sustainability/ Social Project or Social Enterprise

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CS200 Social Entrepreneurs, Sustainability and Community Action was a pedagogical experiment that took me into a new teaching area, so the enthusiastic engagement of the small pilot cohort was a relief. Equally important, the pilot enabled me to find out if my perceptions of gaps in students' knowledge and understanding were justified. In this regard, the reflective essay, which students write after week seven, was particularly valuable. Reading these essays is a way to gauge

what students have learned and enjoyed, and over the years, the main themes have been remarkably consistent. Before the module, few have studied climate change or have any knowledge of neoliberalism, and most know little about social enterprises and cooperatives. Of the alternative paradigms, they invariably discuss the circular economy, suggesting it is easier to grasp than degrowth or the Green New Deal. Another insight from their essays is that most students really enjoy the group case study research and presentations. They frequently express surprise at the number of organisations working for sustainability, and say this gives them hope and makes them feel more optimistic about the future. It is also worth noting that the creativity and high quality of many of their final projects often exceeds their and my expectations.[21] In terms of longer-term impacts, one indicator is that more students are going on to do climate/environment related dissertations and Masters' degrees.

Due to the success of the pilot, CS200 became a permanent part of our interdisciplinary studies curriculum – although it is only compulsory on some degrees – and two years later I was asked to design a follow-on final year option. This became CS300 Community Engagement: Sustainability Group Projects, which has a practical orientation and uses learning through discovery and doing (based on how much CS200 students benefitted from these). I have also used the flexible pedagogical scaffold derived from Freire, CAT and Klein to structure other small-scale EfS initiatives and public talks. The most notable is the Summer School in Sustainable Practice, which is now in its sixth year.[22] As Figure 4 shows, one of the strengths of the framework is that it can be re-oriented and updated according to the particular aims of the course or talk.

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21. The final projects are required to identify and address an actual gap in existing provision and/or services in a specific place: they range from community gardens, local sustainable transport and food waste schemes, to converting a derelict building into a zero-carbon hub for social enterprises.
22. This intensive, extra-curricular course provides 25 places for Essex students from all disciplines and levels of study, free of charge. It is held in the last two weeks of the Summer term.

Figure 4
Summer School in Sustainable Practice 2023

- Understanding the Climate & Biodiversity Crisis; Beyond Neoliberalism & "Sustainable Development"
- C20th High Modernist Development, Regenerative Agriculture & Resilience
- Fieldtrip & Vegan Lunch: Bennison Organic Farm CSA
- Ecoliteracy, Conservation, and Rewilding
- Fieldtrip: Essex Wildlife Trust, Fingringhoe Reserve
- Towards Zero Carbon Energy, Transport, Homes and Buildings
- Acting for Change on Campus
- Group Projects
- Project Presentations and Closure

Conclusions

Ten years after she published *This Changes Everything*, Klein's prediction about neoliberal resistance to climate action has proved remarkably accurate – and has also become relevant to libertarian populism. The denial, delays and rhetoric of successive UK Conservative governments are a textbook case. Moreover, far from implementing the SDGs on ending poverty or reducing hunger and inequality, the Conservatives have cut overseas aid; and, domestically, austerity policies have dramatically increased precarity, hunger and the use of food banks. In terms of policy, we still haven't had a public education campaign; and the Department for Education's 2023 token initiative for schools resisted campaigners' calls to systematically integrate climate education into teacher training and the national curriculum. Consequently, most students are still arriving at university with little knowledge about climate change and unaware of positive sustainability initiatives. At the same time, students' material conditions have deteriorated due to the fees hike and the inadequacy of the loans regime and many are working long hours to fund their studies. This means they have little time or energy for extra-curricular activities,

including political engagement, and the anxieties of living in precarity are compounded by a diffuse sense of climate doom.

Given this context, higher education has a crucial role in climate and sustainability education. Many UK universities have declared a climate emergency and there is more environmental research and more environmental modules in the curriculum than ten years ago. But with a few exceptions, integrating climate and sustainability teaching into the compulsory core curriculum remains an urgent task. Within such teaching, as I have argued here, it is important to include some discussion of neoliberalism, whether in its classic or populist form, and to inspire hope by making visible both the possibilities for change and those that are already occurring.

CLIMATE CHANGE RESEARCH AND EDUCATION IN ZIMBABWEAN UNIVERSITIES

Dr Eric Kushinga Makombe[1]

Introduction

While the Global Carbon Atlas ranks Zimbabwe as a low-carbon emitting country, it is simultaneously susceptible to extreme climate events and natural hazards due to its location in the southern subtropics. University researchers are often at the forefront of climate change research and education elsewhere, particularly in the global 'north'. However, universities in Zimbabwe have been hamstrung over many years owing to underfunding and marginalisation, preventing them from influencing mainstream national discourses and policies. Most of the nation's universities thus tend to have small cohorts of independently funded researchers and instructors working independently or establishing small, semi-autonomous institutions since universities have not been able to support all the teaching and research needed.

This essay assesses the state of climate change research and education in the country's nine public universities. I will attempt to gauge the extent to which the research outputs and outcomes inform or influence public discourse, more so since the country adopted an educational philosophy, Education 5.0, which espouses integrating tertiary education research outcomes into the nation's development agenda.[2] Nonetheless, this research will gauge to what extent universities realise this goal. The paper relies on desktop reviews of grey literature produced by the universities in the form of reports, research records, and the university database. The essay focuses on the nine state universities in the country, which are University of Zimbabwe (UZ), National University of Science and Technology (NUST), Midlands State University (MSU), Great Zimbabwe University (GZU), Gwanda State University (GSU), Lupane State University (LSU), Manicaland State University of Applied Sciences (MSUAS), Chinhoyi University of Technology (CUT) and Bindura University of Science Education (BUSE). In 2016, the Zimbabwean government drew extensively on the 13th Sustainable Development Goal (SDG) while developing its climate change policy. SDG 13 calls for addressing climate change by combining knowledge systems, each supported by a distinct epistemology. In its National Communication, the government proposed establishing a climate change centre of excellence at a government-designated university like UZ to strengthen climate change education and research in tertiary education. No public higher education institution has yet established such a centre of excellence. The Zimbabwean government has long suffered from implementation paralysis. Well-articulated policies frequently result in stillbirths.

In 2020, the government launched the National Climate Change Learning Strategy (NCCLS) developed under the UN CC: Learn Programme's Southern Africa Initiative. The NCCLS identifies the critical learning and skill development needs in key climate-related

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2.   Muzira, Dumisani Rumbidzai, and B. Maupa Bondai, 'Perception of educators towards the adoption of education 5.0: A case of a state university in Zimbabwe', *East African Journal of Education and Social Sciences* 1, no. 2 (2020): 43-53; Keche, Kudakwashe, 'Relevancy of new higher education approaches in 'Second Republic Zimbabwe'', in: L. Waller & S. Waller (eds.), *Higher Education-New Approaches to Accreditation, Digitalization, and Globalization in the Age of Covid* (London 2022: InTechn Open): 139-160.

sectors such as energy, agriculture, environment, education, and health.[3] The strategy aims to create awareness and build capacity for climate change adaptation and mitigation in the country's universities.

Education

UZ is the oldest public university in Zimbabwe, and until NUST opened its doors in 1991, it was the only university in the country. UZ was long seen as conservative, and it required the emergence of other public universities in the late 1990s and early 2000s for the institution to embark on far-reaching curriculum reviews. While many public universities began incorporating climate change issues into their curricula in the 1990s, a proliferation of climate-related degree programmes became more noticeable by the middle of the 2010s. These universities also embarked on climate change research with greater vigour.

CUT, for instance, established the School of Wildlife and Environmental Science in 2014.[4] The school offers BSc (Hons) degree programmes such as Wildlife Ecology and Conservation, Environmental Conservation and Geo-Informatics, and an MSc in Biodiversity Conservation. In particular, the Environmental Science and Technology undergraduate degree programme emphasises technology as an essential tool in addressing climate change problems. The emphasis on technology indicates the programme's modern strategy in addressing climate change.

Additionally, the BSc (Hons) in Environmental Health shows another dimension of health challenges associated with climate change. The curriculum emerged in response to health and environmental issues brought on by new infections and global warming, requiring the

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3.   Government of Zimbabwe, 'National Climate Change Learning Strategy: 2020–2030', Ministry of Environment, Climate, Tourism and Hospitality Industry, 30 December 2020, accessible at: https://www.uncclearn. org/wp-content/uploads/2021/03/NCCLS.pdf.
4.   Chinhoyi University of Technology, 'School of Wildlife and Environment', https://www.cut.ac.zw/welcome/school/3900tech45, 2020 (Accessed 17 January 2024).

expertise of environmental scientists and health professionals. The degrees on offer show CUT's expansive approach to addressing climate change.

GZU's School of Agriculture and Natural Sciences, in 2015, introduced degrees such as Soil and Plant Science and Livestock, Wildlife and Fisheries.[5] These degree programmes purposed to equip students with the "relevant skills in critical thinking and [to] solve developmental challenges in the community". In addition, degree programmes such as Cultural Geography and Rural Development Geography equip undergraduate students with the knowledge and skills to understand the Zimbabwean environment. These degree programmes aimed to train students with skills to address communities' ecological challenges resulting from the continuing adversities of climate change.

MSUAS occupies an agro-economic niche within climate studies. The university established the Department of Agricultural Economics in 2016, offering a BSc in Agricultural Economics and Development.[6] The programme focuses on socioeconomic problems such as rural poverty, food security and the various challenges farmers experience. The Department seeks to contribute to developing knowledge and economic theory in addressing contemporary and prospective social issues in agricultural production, including climate change.

GSU is a relatively new institution, having been founded in 2012. Still, it has already integrated climate change into its curriculum through programmes such as the BSc (Hons) in Geography and Environmental Science.[7] This four-year programme deals with the geographical and environmental dynamics affecting countries. It also looks at different

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5.   Great Zimbabwe University, 'School of Natural Sciences', https://www.gzu.ac.zw/school-of-agriculture-and-natural-sciences-home/, 2024 (accessed 17 January 2024).

6.   Manicaland State University of Applied Sciences, 'Bachelor of Science in Agricultural Economics and Development Honours Degree, Agricultural Economics Department', https://msuas.ac.zw/bachelor-of-science-in-agricultural-economics-and-development-honours-degree, 2024 (accessed 19 January 2024).

7.   Gwanda State University, Faculties & Units, https://www.gsu.ac.zw/?page_id=2724 (accessed 8 February 2024).

ways and interventions to manage the effects of climate change in the country.

In 2018, BUSE introduced an MSc in Climate Change and Sustainable Development as part of its graduate programmes.[8] The degree focuses on major climate issues such as climate and social justice, disaster and sustainable development, mitigation and adaptation in theory and practice. NUST introduced a similar programme "to educate and train new generations of researchers, practitioners and decision-makers in climate change and sustainable development in the Southern African region".[9] The programme is regionally focused, framing a strong inter or trans-disciplinary and integrated system to enable inclusive engagement with non-academic communities from different sectors relating to climate change and sustainable development in Africa. The MSc was bench-marked against a similar programme at the University of Cape Town in South Africa.[10]

In 2021, BUSE embarked on a climate change training initiative to develop the surrounding communities on climate change mainstreaming in development projects. The training was for five Mashonaland Central Provincial Development Committee members after signing a Memorandum of Understanding (MOU) with the Ministry of Environment, Climate, Tourism, and the Hospitality Industry (MECTHI).[11] A pilot project in the Rushinga District, one of the province's most drought-prone areas, informed the training. Such efforts support Education 5.0's desire for universities to impact their communities.

8.   Bindura University of Science Education, 'Promoting Science for Human Development Master Of Science Degree in Climate Change and Sustainable Development', https://www.buse.ac.zw/faculties/science/geography-department/master-of-science-degree-in-climate-change-and-sustainable-development, 2024 (accessed 17 January 2024).
9.   National University of Science and Technology, Programmes, https://www.nust.ac.zw/fes/index.php/course-finder/msc-in-climate-change-and-sustainable-development#course-instructor (accessed 8 February 2024).
10.   University of Cape Town, 'Environmental and Geographical Science, Overview: Masters in Climate Change and Sustainable Development', https://science.uct.ac.za/department-egs/degrees-courses-masters-masters-climate-change-development/overview-masters-climate-change-sustainable-development, 2024, (accessed 19 January 2024).
11.   https://www.buse.ac.zw/buse-and-ministry-of-environment-in-climate-change-collaboration-pact/

NUST also has programmes such as the BSc (Hons) in Environmental Science and Health, which have courses that include "Introduction to the Physical Environment and Climate Change Adaptation in Semi-Arid Lands".[12] Another programme focusing on climate change is the BSc (Hons) in Geographical Information Systems and Remote Sensing in Natural Resources Management.[13] The BSc (Hons) in Forest Resources and Wildlife Management also has a module on "Humans and the Environment" that focuses on the impact of global warming on the human environment.

A "Stakeholder Needs Assessment" by the government of Zimbabwe in 2020 identified specific human resources capacity gaps at BUSE and NUST. At BUSE, the report pinpointed that "some members lack creativeness and interest on [climate change] issues".[14] While NUST had more institutional capacity (than BUSE) to deliver learning in terms of expertise in climate change science, training in REDD,[15] research skills in climate science and more PhD qualifications, it still had "insufficient … staff in the area of climate change".[16] Further, NUST had "limited resources for staff to capacitate themselves on latest climate change issues". Its Climate Institute did "not have enough resources for trainings [*sic*] and basic staff development".

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12. National University of Science and Technology, Programmes, https://www.nust.ac.zw/fes/index.php/course-finder/bachelor-of-environmental-science-honours-degree-i.

13. National University of Science and Technology, Programmes, https://www.nust.ac.zw/fes/index.php/course-finder/bachelor-of-science-honours-degree-in-geographical (accessed 19 January 2024).

14. Government of Zimbabwe, 'Assessment of Learning Needs and Capacity to Deliver for the National Climate Change Learning Strategy', Ministry of Environment, Climate, Tourism and Hospitality Industry, January 2020, accessible at: https://www.uncclearn.org/wp-content/uploads/library/stakeholder_needs_assessment_zimbabwe.pdf, p. 9.

15. REDD stands for Reducing Emissions from Deforestation and forest Degradation in developing countries. See: Gizachew, Belachew, Rasmus Astrup, Pål Vedeld, Eliakimu M. Zahabu, and Lalisa A. Duguma, 'REDD+ in Africa: contexts and challenges', *Natural Resources Forum* 41, no. 2 (2017): 92–104.

16. https://www.uncclearn.org/wp-content/uploads/library/stakeholder_needs_assessment_zimbabwe.pdf, p. 9.

UZ has also included climate change in its curriculum. The Faculty of Arts and Humanities has programmes such as an MA in Risk Reduction and Disaster Management.[17] The Faculty of Social and Behavioural Sciences has also embraced climate change, as seen from programmes such as the MSc in Socio-Ecological Systems and Development Practice.[18]

MSU's Department of Development Studies programmes focus on climate change and sustainable development.[19] The Faculty of Agriculture, Environment and Natural Resource Management offers programmes such as the BSc (Hons) in Land Water Resources Management and the BSc (Hons) in Environmental Science and Technology.[20] The Faculty of Social Sciences has programmes in Geography and Environmental Sustainability.

LSU's Development Studies department offers programmes covering topical issues such as Food Security, Management of Resources and Climate Change. The Department offers a Diploma, a Bachelor's and a Master's degree in Development Studies.[21] The many levels at which LSU provides these programmes in the curriculum reflect the university's desire to guarantee that more individuals are informed about climate change, including those who do not meet the minimal entry-level criteria to complete an undergraduate degree programme. Although the nine public universities reviewed their curriculum to include some climate change issues, they still lack an in-depth and practical approach to these issues. The teaching staff are not equipped

17.   University of Zimbabwe, Faculty of Arts and Humanities, https://www.uz.ac.zw/index.php/degree-programmes-arts (accessed 19 January 2024).
18.   University of Zimbabwe, Faculty of Social and Behavioural Sciences, https://www.uz.ac.zw/index.php/social-studies-programmes (accessed 19 January 2024).
19.   Midlands State University, Department of Development Studies, https://ww5.msu.ac.zw/home/faculties/arts/development-studies/ (accessed 19 January 2024).
20.   Midlands State University, Department of Land and Water Resource Management, https://ww5.msu.ac.zw/home/faculties/natural-resources-management/land-and-water-resources-management/ (accessed 19 January 2024).
21.   Lupane State University, Department of Development Studies, http://www.lsu.ac.zw/university-academic-department/10 (accessed 19 January 2024).

with climate change information to make significant changes to learners. This problem, in part, stems from a lack of funding for cutting-edge research, as discussed below. However, the other part is that the "country lacks policy direction on integrating climate change into the tertiary education curricula".[22] The government's "Specific Needs Assessment" recommended that the actions taken to mainstream content related to climate change within primary and secondary school curricula should also occur at the tertiary level of education.

Research

Funding for research in Zimbabwean universities remains limited due to the protracted economic crisis. The economic malaise has reduced the resource inflows towards research.[23] Following a diplomatic stalemate with Britain and other Western countries in the early 2000s over the land reform programme, Europe and the USA substantially decreased the support they had previously extended to Zimbabwe. The Institute of Development Studies (IDS) at UZ became part of the collateral damage. The IDS had previously partnered with the International Institute for Environment and Development and the UK Department for International Development (DFID) in climate-related research.[24] But when these funding streams dried out, many of their researchers, including Medicine Masiiwa and Prisca Mugabe, had to be redeployed to other departments before the IDS closed. Despite these challenges, Zimbabwe's universities have persevered with the little they have.

The government has sought to fill in the gap left by this withdrawal of funds, but often with uneven outcomes due to limited capacity and a disciplinary bias. The Humanities, Arts and Social Sciences (HASS) disciplines have often complained that the state disproportionately angles much of their funding towards the Sciences, Technology,

22. https://www.uncclearn.org/wp-content/uploads/library/stakeholder_needs_assessment_zimbabwe.pdf.

23. Chinhoyi University of Technology, *Annual report 2017* (Chinhoyi, 2017: CUT Printing Press).

24. Brown, Donald, Rebecca Rance Chanakira, Kudzai Chatiza, Mutuso Dhliwayo, David Dodman, M. Masiiwa, D. Muchadenyika, P. Mugabe, and S. Zvigadza, *Climate change impacts, vulnerability and adaptation in Zimbabwe* (London 2012: International Institute for Environment and Development).

Engineering and Mathematics (STEM) disciplines. This imbalance partly explains how foreign donors remain the major research funders in Zimbabwean universities and, more often, the sole funders for HASS researchers working on climate change topics. However, this creates challenges, especially when the research interests of foreign donors take precedence in crafting the research agenda.

In 2019, the government spent nearly $18 million on constructing innovation hubs and set aside $1 million to purchase equipment for completed hubs.[25] In 2021, NUST signed the climate change mainstreaming research programme in partnership with the MECTHI.[26] The project sought to roll out programmes and projects that support climate adaptation.

At GZU, the newly created Innovation Hub has prioritised climate challenges. GZU's Director of Research and Innovation, Jephias Gwamuri, is an applied physicist who directs research within the innovation hub. At the hub, innovative ideas related to climate change include agro-technologies like intelligent farming and future energy technologies like agri-voltaics.[27] It is still too early to evaluate the results and outputs of these innovation efforts.

State funding outside these innovation hubs has been minuscule. The GSU has been researching climate change to improve food security and climate resilience in the face of unpredictable weather patterns in southwest Zimbabwe. However, their research project on the "Characterisation and drought stress trials of experimental Sorghum bicolour lines" has no source funding.[28] The government of Zimbabwe even acknowledged the lack of competencies in grant proposal writing at BUSE as a shortcoming requiring urgent redress. Further, the report

25.   Tsiko, S., 'Innovation hubs hold key to industrialisation', *The Herald*, 2019, https://www.herald.co.zw/innovation-hubs-hold-key-to-industrialisation/# (accessed 19 January 2024).
26.   *The Chronicle*, 25 March 2021, https://www.nust.ac.zw/index.php/component/content/article/107-lead-news/522-nust-sign-climate-change-mainstreaming-research-mou.html?Itemid=437 (accessed 19 January 2024).
27.   Great Zimbabwe University, 'Research and Innovation', https://www.gzu.ac.zw/research-and-inovation, 2024, (accessed 17 January 2024).
28.   Gwanda State University, Research & Innovations, https://www.gsu.ac.zw/?page_id=1441.

highlighted that BUSE staff "lack financial support to actively [*sic*] participate in Climate Change information dissemination".[29]

Notwithstanding these difficulties, BUSE produced notable research in 2018. However, the majority of its funding came from outside sources. The university managed to sign the Global Biodiversity Information Facility MOU on behalf of Zimbabwe in 2018. The agreement led to a research grant of $350,000 from the Regional Universities Forum for Capacity Building in Agriculture.[30] The grant assisted the university's research on using tied contour rainwater harvesting in small grain and legume production in semi-arid smallholder farming areas of Zimbabwe. Another grant from the International Foundation of Science aimed at expanding work in flood recession cropping in Muzarabani.

CUT has earned a regional role in climate change research. In 2017, Justice Nyamangara was awarded a three-year research grant of $9,000 by the International Plant Nutrition Institute (IPNI)-sub-Saharan Africa programme to study "Long-term evaluation of the effects of tillage systems and ISFM [integrated soil fertility management] on crop productivity and soil properties".[31] CUT was also part of Future Climate for Africa's research on climate change in Southern Africa.[32] The study aimed to understand the policy context and the climate science required to contribute to climate resilience in the region's nine cities: Blantyre, Durban, Cape Town, Gaborone, Harare, Johannesburg, Lusaka, Maputo, and Windhoek. The DFID and the Natural Environment Research Council funded the initiative.

MSUAS researchers have received considerable recognition at local and regional levels for their efforts. Rutendo Nyamusamba of the Department of Agricultural Economics has research interests in sustainable farming, weed biology, ecology and management.[33]

29.   https://www.uncclearn.org (accessed 19 January 2024).
30.   Mushanawani, C., 'ED to caps 1719 at Bindura University', *The Chronicle*, 19 October 2018.
31.   Chinhoyi University of Technology, *Annual report 2017*.
32.   Future Climate for Africa, 'Country Summary, Summary of FCFA work in Zimbabwe', http://www.fractal.org.za/, 2020, (accessed 19 January 2024).
33.   Nyamusamba, Rutendo PC, 'Impact of Mobile Night Kraals on Soil PH in Crop Fields—a Pilot Study', in: X. Poshiwa & G.R. Chary (eds.), *Climate Change Adaptations in Dryland Agriculture in Semi-Arid Areas* (Singapore

She had multiple research awards, including her work on "Control options for glyphosate resistance and tolerant weeds in Roundup Ready soybeans" (2012). The research received a grant of $10,500 from the South Dakota Soybean Research and Promotion Council. Nyamusamba's other project, "Conversation: Mixed Farming for Resilient Food Production" (2016), received a grant of $5,000.[34]

Elinah Nciizah of the Department of Development Studies at MSU has published on climate change and rural livelihoods in Zimbabwe's semi-arid areas.[35] Raymond Mugandani and Tirivashe Masere, part of the MSU's Department of Land and Water Resource Management, have also done notable work on climate change.[36] For instance, Mugandani et al. reclassified the country's agro-ecological zones using data on the soil, mean annual rainfall, and the duration of the growing season.[37] The Department of Geography, Environmental Sustainability and Resilience Building also has scholars researching climate change, such as Vurayai Mutekwa and Mavis Mbiriri.[38]

2022: Springer Nature Singapore): 285–288.

34.   Midlands State University of Applied Sciences, Staff: Lecturer, https://msuas.ac.zw/rutendo-nyamusamba/

35.   Nciizah, Tendai, Elinah Nciizah, Caroline Mubekaphi, and Adornis D. Nciizah, 'Smallholder farmers' adaptation strategies and food security: Experiences from Zimbabwe', in: H.A. Mupambwa, A.D. Nciizah, P. Nyambo, B. Muchara & N.N. Gabriel (eds.), *Food Security for African Smallholder Farmers* (Singapore 2022: Springer Nature Singapore): 267-280.

36.   Mugandani, Raymond, Tavagwisa Muziri, Cyril Tapiwa Farai Murewi, Amanda Mugadza, Tavengwa Chitata, Marvelous Sungirai, Farai Solomon Zirebwa et al., 'Mapping and Managing Livelihoods Vulnerability to Drought: A Case Study of Chivi District in Zimbabwe', *Climate* 10, no. 12 (2022): 189; Masere, Tirivashe P., and S. Worth, 'Influence of public agricultural extension on technology adoption by small-scale farmers in Zimbabwe', *South African Journal of Agricultural Extension* 49, no. 2 (2021): 25-42; Makuvaro, Veronica, Sue Walker, Tirivashe Phillip Masere, and John Dimes, 'Smallholder farmer perceived effects of climate change on agricultural productivity and adaptation strategies', *Journal of Arid Environments* 152 (2018): 75-82.

37.   Mugandani, Raymond, M. Wuta, A. Makarau, and B. Chipindu, 'Re-classification of agro-ecological regions of Zimbabwe in conformity with climate variability and change', *African Crop Science Journal* 20 (2012): 361-369.

38.   Mutekwa, Vurayai, *Forest governance, conservation and livelihoods: the case of forest protected areas and local communities in north-western Zimbabwe* (Unpublished PhD Thesis, Rhodes University, 2016); Munodawafa, Davison, Tendai Madanzi, Pepukai Manjeru, and Mavis Mbiriri, *Building*

Crop scientists and plant biologists at LSU have also been researching using drought-resistant crops to enhance climate resilience among various communities in the country. For instance, Mcebisi Maphosa's research has been on scaling up the use and production of climate and nutrition-smart millets, legumes and cucurbits for improved livelihoods.[39] The researcher collaborated with National Gene Banks, Consultative Group for International Agricultural Research partners, National Agricultural Research Institutions and seed companies.[40] Maphosa is working on two other projects funded by the Food and Agriculture Organisation (FAO), the International Treaty of Biodiversity and the Global Crop Diversity Trust.

UZ also has a climate change and resilience research unit, the Environment, Climate and Sustainable Development Institute (ECSDI).[41] The ECSDI mutated from the now defunct Institute of Environmental Studies (IES), and it coordinates research in Waste Management and Air Pollution Reduction, Environmental Assessments and Protection, Poverty, Climate Change and Resilience Building and Renewable Energy. The omnibus research agenda means that the institute draws its researchers and affiliates from various faculties at the University of Zimbabwe. The ECSDI's Director is Kefasi Nyikahadzoi, whose research interests are rural development, livelihoods, and food security.[42] The

resilience to natural disasters in populated African mountain ecosystems: The case of Tropical Cyclone Idai in Chimanimani, Zimbabwe (Chimanimani, 2020: Tsuro Trust).

39.   Lupane State University, 'Use of climate and nutrition smart millets, legumes and cucurbit germplasm for improved livelihoods', accessible at https://lsu.ac.zw/public/assets/downloads/1669191111.pdf. See also: Maphosa, Mcebisi, Herbert Talwana, and Phinehas Tukamuhabwa, 'Assessment of comparative virulence and resistance in soybean using field isolates of soybean rust' (2013).

40.   https://lsu.ac.zw/public/assets/downloads/1669191111.pdf

41.   University of Zimbabwe, 'Environment, Climate and Sustainable Development Institute', https://www.uz.ac.zw/index.php/228-institutes-and-units/1019-development-technology-centre-agriculture, 2024 (accessed 19 January 2024).

42.   Nyikahadzoi, Kefasi, Shephard Siziba, Nelson Mango, Paul Mapfumo, Adewale Adekunhle, and Oluwole Fatunbi, 'Creating food self-reliance among the smallholder farmers of eastern Zimbabwe: exploring the role of integrated agricultural research for development', *Food Security* 4 (2012): 647-656; Zamasiya, Byron, Kefasi Nyikahadzoi, and Billy Billiard Mukamuri, 'Factors influencing smallholder farmers' behavioural intention towards adaptation to

ECSDI has forged strategic partnerships with organisations such as the Centre for Natural Resource Governance, the Zimbabwe Environmental Law Association and the European Climate Foundation to circumvent the lack of funding and resources. Such alliances bring together activists, scholars, and industry professionals.

Besides the ECSDI, the UZ has a Center for Applied Social Sciences (CASS), which dips into research around climate variability. Kudzai Chatiza of CASS is particularly interested in post-disaster risk management in the aftermath of the devastating Cyclone Idai and adaptation policy measures in the country.[43] In addition, faculty members have also conducted various research studies on climate change. For instance, the Faculty of Arts and Humanities is pursuing community-based research using an inter-faculty and trans/multi/interdisciplinary approach.[44] Some sociologists and anthropologists from the Faculty of Social and Behavioural Sciences, including Sandra Bhatasara, have worked with rural communities to learn how they use indigenous techniques to protect the environment, such as tree conservation and natural land replenishment strategies like crop rotation and organic matter.[45]

With source funding from government and international donors heavily tilted towards STEM research, the conceptualisation of climate change is mainly science-driven and projected primarily as a national and quantitative phenomenon in mainstream academic and policy discourse.[46] Regrettably, understanding local-level consequences through farmer perspectives is still underappreciated in the country.

climate change in transitional climatic zones: A case study of Hwedza District in Zimbabwe', *Journal of Environmental Management* 198 (2017): 233-239.

43.   Chatiza, Kudzai, *Cyclone Idai in Zimbabwe: An analysis of policy implications for post-disaster institutional development to strengthen disaster risk management* (Oxford 2019: Oxfam International).

44.   https://www.uz.ac.zw/index.php/research-arts

45.   Bhatasara, Sandra, *Understanding climate variability and livelihoods adaptation in rural Zimbabwe: A case of Charewa, Mutoko* (Unpublished PhD Thesis, Rhodes University, 2015); Bhatasara, Sandra, and Admire Nyamwanza, 'Sustainability: a missing dimension in climate change adaptation discourse in Africa?', *Journal of Integrative Environmental Sciences* 15, no. 1 (2018): 83-97.

46.   Bhatasara, Sandra, 'Rethinking climate change research in Zimbabwe', *Journal of Environmental Studies and Sciences* 7 (2017): 39-52.

Despite embracing the notion of interdisciplinarity, the outputs from HASS research hardly figure in the national discourse. Patience Mutopo's case study in the Mwenezi District has shown that rural women could not adopt climate-smart agriculture practices because of systemic structural barriers that create gender gaps and inequalities, including unequal access to credit, technology and agricultural inputs, and capacity-building.[47] Beyond highlighting the need to tackle pre-existing societal conditions simultaneously with climate change, HASS research has also demonstrated that preconceived strategies that dealt with past climate variability are becoming increasingly ineffective for coping with emergent climate change. Unfortunately, STEM data prevails when it conflicts with HASS research results.

Conclusion

Universities in Zimbabwe play a significant role towards climate change education and research. All nine state institutions have climate programmes and modules in most of their curriculum. Climate change is a topical issue that cuts across different HASS and STEM disciplines. Zimbabwean universities have conducted substantial climate-specific research. However, the prolonged Zimbabwean economic crisis has constrained locally funded studies. While foreign institutions have helped provide research funding, the Zimbabwean government has also played a crucial role in financing research and providing the policy framework and educational philosophy to guide the teaching and learning of climate change in the country's public universities.

The essay also observed that despite the limited funding, some academics have taken the initiative to collaborate internally and with external stakeholders towards research activities and community programmes, contributing to climate change science, adaptation, mitigation, and resilience in Zimbabwe. The smaller universities, such as CUT and BUSE, have modelled how universities can translate climate-related research into policy and action by fostering linkages between

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47.   Mutopo, Patience, *Gendered dimensions of land and rural livelihoods: The case of new settler farmer displacement at Nuanetsi Ranch, Mwenezi District, Zimbabwe* (Brighton 2012: LDPI).

academics and other stakeholders, including rural communities, towards climate-smart development initiatives.

Besides some notable inroads made in climate change education and research, this appraisal identifies two broad challenges: Financial and Epistemic. The country's past political pariah status, more so under the previous leader, Robert Mugabe, impinges on the ability of the country's public universities to attract international climate change funding at the level of development cooperation. Relatedly, the STEM bias evident in Education 5.0 creates epistemic injustices towards the evident contributions that HASS can make to climate change education and research. The review is, therefore, somewhat sceptical of the government's recommendation about "standardising the teaching of [climate change] courses throughout the country's universities".[48] Such proposals go against the essence of interdisciplinarity that many universities purport to adhere to. Instead, grounded research from HASS and STEM, researchers must inform climate change teaching and learning outcomes. Further, the curriculum must remain mindful of differences informed by human and environmental disparities in the country.

48.		Government of Zimbabwe, Assessment of Learning Needs, 4.

ECOLITERACY

Skills for Sustainable Education

Professor Sieglinde Lemke

What are the necessary competences the next generation should obtain that would make for a more sustainable future? Possible answers to this simple question include: we need education for sustainability, environmental education, and education for sustainable development (ESD). While these concepts are used interchangeably, some scholars avoid the later term to set themselves off from the growth-oriented ideology of sustainable development. But even UNESCO's ESD Roadmap for 2030 foresees a development that combines teaching the relevant scientific facts with the basics for ecological living. Its declared mission is to raise awareness towards climate destruction and ecocide, but also towards gender equality, global citizenship, and cultural diversity. It sets out to teach students how to preserve natural resources, how to interact with their environment in non-violent ways, and much more.[1] The ESD roadmap introduces teachers and

1. These, and more, learning targets comply with the roadmap on ESD the UN published recently. Their goal is to "ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development" (14). This list of skills and targets should be ensured, according to this plan, "by 2030" (14). While

students to the broader "culture of sustainability," its social values, ideals, norms, and practices. Such an inclusive approach aligns with the Sustainability Development Goal (SDG) 4, an equitable quality education. Moreover, this culture of sustainability encompasses a new, decidedly *sustainable*, worldview that will allow the future generation to upend the non-sustainable lifestyle of past generations, thereby diverging from technocratic solutions for sustainability. The UN has explicitly, and repeatedly, emphasized the importance of cultural factors for sustainable development.[2] And several Sustainability Development Goals (e.g., SDG goals 3, 11, 12, 16, 17) center on cultural skills while others (e.g. 1, 2, 6, 8, 9, 13, 14, 15) are more specifically geared towards the economy and the natural environment to secure e.g. access to clean water or to put an end to hunger and poverty.

This very interdependency between cultural factors and sustainability is the focus of Janet Stephenson's monograph *The Cultures Framework*, which conceptualizes sustainability outcomes through a triad of 1) motivators: i.e., norms, ideas, knowledge; 2) activities: i.e., routines and rituals; 3) materiality: i.e., physical and digital objects, products and acquisitions.[3] To Stephenson, we need to closely consider the "culture ensemble" to better understand, and teach, sustainable ways of *thinking*, *acting*, and what one might call '*having*.'[4] If we ignore this

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it is unlikely that this idealist vision will be realized within this decade, this very ambitious list does include many essential pillars for an education that aspires towards making the future more sustainable. UNESCO, "Education for Sustainable Development: A Roadmap," UNESCO Digital Library, DOI: 10.54675/YFRE1448.

2.   See United Nations, "Culture and Sustainable Development," 21 May 2019, accessible at: https://www.un.org/pga/73/event/culture-and-sustainable-development/; and UNESCO, Culture: A Driver and an Enabler of Sustainable Development, May 2012, accessible at: https://www.un.org/millenniumgoals/pdf/Think%20Pieces/2_culture.pdf.

3.   Janet Stephenson, *Culture and Sustainability: Exploring Stability and Transformation with the Cultures Framework* (Cham 2023: Springer), chapter 4. Stephenson is the Director of the Centre for Sustainability at the University of Otago, New Zealand. She heads an international, multidisciplinary research team on energy cultures.

4.   In her Inaugural Professorial Lecture titled "Culture and Sustainability", broadcasted on 16 Sept. 2021, Stephenson uses the triad of practices, norms, and materiality, which respectively corresponds to doing, thinking and having. https://www.youtube.com/watch?v=AJJiN84BRGc.

culture ensemble, neither the present nor the next generation will be able to effectively move towards a more sustainable future.

Calls for a cultural approach to sustainability have been around for decades. They come by different labels including those of ecopedagogy and ecoliteracy, emphasizing the role of socio-psychological factors.[5] Isabel Rimanoczy's ecoliterate approach, which I elaborate on below, is notable in this regard since it provides guidelines on how to attain, and teach, "the sustainability mindset."[6] Before I expound on these socio-psychological factors, let's consider two other common denominators that academics, activists, and policy-oriented initiatives seem to agree on since they insist that sustainability education has to be holistic and transformative.

Rhetorical appeals to a "holistic" education are omnipresent. Mostly 'holistic' is used synonymously with transdisciplinary to assure that the many facets and interconnections of (non-)sustainability are taken into account. To adequately assess human-nature and human-planetary relations, we quintessentially need both the social and the natural sciences. This inevitably transdisciplinary approach makes ESD 'transformative' in the sense that it trans- or re-forms hegemonic (non-sustainable) practices by bridging disciplinary divisions. Indeed, sustainability education integrates knowledge from many different fields, ranging from ethics to engineering, from cultural to digital studies, from cognitive psychology to molecular biology.

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5.   I sketch the evolution of cultural approaches to sustainability from the 1980s onwards (in this article further below), yet, for an early explicit reference I recommend the article 'Three Steps Towards a Culture of Sustainability,' published more than a decade ago in *Sustainable Development: Culture, Knowledge, Ethics*, edited by O. Parodi, I. Ayestaran & G. Banse (Karlsruhe 2011: KIT Scientific Publishing): 75–92. Parodi also explored personal factors adding to the emerging field of personal sustainability science. See also Pascal Frank, Johannes Wagemann, Julius Grund & Oliver Parodi, 'Directing personal sustainability science toward subjective experience: conceptual, methodological, and normative cornerstones for a first-person inquiry into inner worlds', *Sustainability Science* 19 (2024): 555–574. Another pioneering article was Davide Brocchi's "Der kulturelle Ansatz der Nachhaltigkeit," published in 2006.

6.   Isabel Rimanoczy, *The Sustainability Mindset Principles: A Guide to Develop a Mindset for a Better World* (Abingdon 2021: Routledge).

Moreover, 'holistic' also refers to the multiple skills it takes to transform our current lifestyle in order to practice new, more sustainable ways of thinking, acting, having, and being. Since sustainability, like the disregard for sustainability, manifests on a personal and a collective level, locally and globally, in public and in private, in our everyday lives and our civic, legal, and political cultures, it is pervasive and all-encompassing. Lastly, holistic (sometimes) refers to an approach that acknowledges diversity, equity, and inclusion. In that sense, ESD overlaps with DEI.

A more holistic (higher) educational system is not utopian. Recently, the pan-European initiative Sustainability Education for Europe (SEFE) demanded that integrated versions of ESD become a part of students' basic formal education.[7] Accordingly, sustainability education will have to become omnipresent in the educational system. To face up to challenges surrounding climate change, biodiversity, and environmental justice, ESD trains students to upend fossil-fuel lifestyles. This means that received habits of thinking, acting, having, and being will have to change. But this in turn demands a sweeping reform of university and high school curricula so that sustainability-relevant topics are taught across the board in various faculties. Instead of being limited to designated degree-granting programs, sustainability issues will become a running theme in various subjects and classes. Students will learn, for example, to calculate energy consumption in mathematics, analyze climate fiction in language and literature classes, and examine eco-interloops in biology classes.[8] To systemically integrate ESD curricula into universities worldwide, it is vital to have a good grasp of the scholarly discourse surrounding sustainability as well as sustainability education.

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7.   See https://www.sustainabilityeducation.eu. The European Sustainability Competence Framework lists 12 necessary skills relevant for curricula design: https://publications.jrc.ec.europa.eu/repository/handle/JRC128040

8.   For more details on curricula reforms, see the publications of different relevant national platforms: e.g., in France, the École ou Établissement en Démarche globale de Développement Durable (E3D) provides ample teaching material and curricula just as the German initiative of ESD, Bildung für Nachhaltige Entwicklung (BNE) offers not only online material but also published Jörg-Robert Schreiber & Hannes Siege (eds.), *Curriculum Framework: Education for Sustainable Development* (2016: Cornelsen).

When the term 'sustainability' was first introduced in 1969, it did not refer to education but to the protection of natural resources.[9] But as early as the 1980s, scholars came to advocate for the institutionalization of ecological learning within the framework of public education. The editors of *Ecopedagogy* (1984), Gerhard de Haan and Wolfgang Beer, pursued a radical approach that exceeded "environmental education." In their view, ecological disasters were "a result of industrial production and lifestyle excesses [caused by] fundamental patterns of thought and action within our society (i.e., culture)."[10] In other words, capitalist production and consumption leads to environmental destruction. Ecopedagogy, thus understood, tries to abolish this pernicious system. Accordingly, ecopedagogy, they insist, "always aims for transformation."[11] Plus, the editors and contributors to *Ecopadagogy* were convinced that "the domination of nature always goes hand in hand with the domination and exploitation of people."[12] Hence, their understanding of ecopedagogy overlaps with contemporary definitions of *sustainability* since both seek environmental as well as social justice. When Haan and Beer argue that we can only overcome this exploitative attitude at the root of ecological destruction if our educational system assumes more "integrative synthetic perspectives," they anticipated calls for a holistic approach to ESD.[13]

Apparently, the term 'education for sustainable development' was coined in 1992 at an international conference in New Zealand by Stephen Sterling, then professor at Plymouth University. In the 2000s and 2010s, Sterling started replacing the term with 'education for sustainability' to avoid the growth-oriented notion of 'development.' In the 2020s Greg William Misiaszek, who has published widely on *ecopedagogy*, also rejected the label ESD, arguing that environmental and social violence are always interrelated.[14] This radical undertone

9.   In 1969, the U.S. National Environmental Policy Act (NEPA) defined sustainability as "the ability to maintain or improve standards of living without damaging or depleting natural resources for present and future generations."
10.   Gerhard de Haan & Wolfgang Beer, *Ökopädagogik: Aufstehen gegen den Untergang der Natur* (Beltz 1984: Die blaue Reihe), 9, author's translation.
11.   Ibid., 135.
12.   Ibid., 136. The original German reads: "Naturbeherrschung geht immer mit Menschenbeherrschung einher."
13.   Ibid.
14.   Greg William Misiaszek, *Ecopedagogy: Critical Environmental*

seems to be missing in the policy-oriented discourse that prefers the term ESD. Those who use the label 'education for sustainability,' 'sustainability education,' and 'ecoliteracy' usually set themselves off from mechanistic, managerial, tech-, and growth-driven approaches to 'sustainable development.'[15] Most scholars who try to implement 'ecopedagogy' in public education aim at transforming the educational system to secure that new ways of teaching and thinking enhance sustainability outcomes. The follow-up question then must be: how can we manage to do so? What does it take to design holistic, transformative curricula?

Firstly, it takes systems thinking to examine natural food cycles, for example. Students have to understand how e.g. planting, growing, and harvesting are impacted by climate change; how composting and recycling depend on alternative farming methods; and how carbon reduction relies on renewable energy sources. It takes systems thinking to grasp how organisms—from bees to bugs, from cows to fungi—are interconnected. Likewise, we have to acknowledge that consumers, politicians, entrepreneurs, and academics all play their part in this collective ensemble that pushes for sustainable outcomes. Hence, we need to see into nature's and humans' connectedness.[16] Secondly, it takes a more humanistic value system. As early as 2001, Sterling advocated for cultural change aspiring to implement both humanistic and ecological values in his book *Sustainability Education: Re-visioning Learning and Change*.[17] Thirdly, as mentioned above, these approaches embrace a transdisciplinary, holistic approach to sustainability. Lastly, all these approaches—be they called ecopedagogy, education for

Teaching for Planetary Justice and Global Sustainable Development (London 2020: Bloomsbury).

15.   Greg William Misiaszek even capitalizes the D in esD to distinguish it from esd. See Greg William Misiaszek, 'Ecopedagogy: Teaching Critical Literacies of "Development", "Sustainability", and "Sustainable Development"', *Teaching in Higher Education* 25, no. 5 (2020): 615–632.

16.   See the volume by that title, which brings together scholars from many fields and urges for a radical transformation of our value system: Gerald Hüther & Christa Spannbauer (eds.), *Connectedness: Warum wir ein neues Weltbild brauchen* (Bern 2012: Huber).

17.   Stephen Sterling, *Sustainable Education: Re-Visioning Learning and Change* (Totnes 2001: Green Books).

sustainability, sustainability education, ecoliteracy or sustainable literacy—are imbued with a strong sense of idealism.

'Ecoliteracy' offers perhaps the most comprehensive agenda since it gravitates around the mental, psychological, and cultural capabilities the current generation should exercise so that the next generation might live sustainably. It is not just about teaching ecologically relevant facts such as CO_2 emissions, ozone depletion, reforestation, or permaculture. An ecologically literate person is someone who does not just understand the basic principles of ecology but who also embodies them in their daily life, Fritjof Capra insisted as early as 1999 in his groundbreaking book *Ecoliteracy: The Challenge for Education in the Next Century*.[18] Capra's idea of ecoliteracy overlaps with Sterling's notion of sustainable education as it centers around both acting and living sustainably. Both validate alternative ways of knowing, thinking, and being. Ecoliteracy also overlaps with received understandings of environmentalism as it is concerned with the relationship humans have with their surroundings. Moreover, it sometimes overlaps with ecocriticism using literary or visual texts to instruct students to become ecoliterate. Yet, ecocinema and ecofiction are not necessarily subject matters in ecoliteracy.[19]

Sustainability literacy, as Arran Stibbe defines the term in his eponymic handbook, is synonymous with ecoliteracy. As the handbook's subtitle, "skills for a changing world," suggests, Stibbe's volume covers a wide range of activities and capabilities.[20] The contributors

18.   Whereas 'ecological literacy' is about understanding the principles of organization that ecosystems have developed to sustain the web of life, Capra suggests that 'ecoliteracy' offers an ecological framework for educational reform. His pioneering view on ecoliteracy, which emphasizes ecological over educational matters, differs from Daniel Goleman's approach since his 2012 publication *Ecoliterate: How Educators Are Cultivating Emotional, Social, and Ecological Intelligence* focuses on the necessary mental skills.

19.   A case in point is the activist website https://www.ecoliteracy. org, which offers teaching material that focuses on, e.g., food, farming, and indigenous perspectives. Only rarely do they discuss artistic depictions or films. One exception is the documentary film Gather: The Fight to Revitalize Indigenous Foodways, accessible at: https://www.ecoliteracy.org/sites/default/files/media/ecoliteracy_gather_viewing_guide.pdf.

20.   Arran Stibbe (ed.), *The Handbook of Sustainability Literacy: Skills for a Changing World* (Totnes 2009: Green Books), 61.

to this transdisciplinary volume address for example the need for waste reduction as well as for self-care, to them, training one's emotional wellbeing is just as important as advertisement awareness. *Sustainability Literacy* openly questions the consumerist capitalist paradigm by arguing that capitalism's obsession with perpetual growth has brought us to the brink of ecological collapse. They claim that advertisement spurs the inexorable desire for consumer objects and pushes mass production, which can deplete natural resources, yield toxicity and/or increase carbon dioxide. To become sustainability literate, students need to rigorously question and critique neoliberal consumer culture.

In fact, many contributors to the handbook, such as Ling Feng and Stephen Sterling,[21] tackle the destructive effects of the dominant ideology of Western societies and specifically individualism's disposition of self-centeredness. Aspiring to be better than others, the "'hyper-individualistic self' loses the capability for relationships with nature and with people."[22] Pro-social skills diminish with highly competitive people who primarily think about themselves and not relationally, which is also detrimental to the environment. "If we want the chance of a sustainable future, Sterling maintains, "we need to think relationally. That's it, full stop."[23] Accordingly, sustainable literacy aims at introducing students to "the commons way of thinking."[24] This relational or commons way of approaching the world resonates with the emergent research field that focuses on human-nature connections. Defining sustainability, as "a method to improve our relationship to resource," Wise et al. scrutinize "nature-connectedness" and ways to reconnect by forming habits

21.   Ling Feng, "Ecological Intelligence: Viewing the Word Relationally," in: A. Stibbe (ed.), *The Handbook of Sustainability Literacy*: 58–63; Stephen Sterling, "Effortless Action: The Ability to Fulfil Human Needs Effortlessly Through Working with Nature," in: A. Stibbe (ed.), *The Handbook of Sustainability Literacy*: 77–83.
22.   Feng, "Ecological Intelligence," 61.
23.   Sterling, "Effortless Action," 77.
24.   The commons way of thinking, or the commons approach, assumes that "a) we live in a common life-world upon which we all depend; b) that any problem stems from a breakdown in relationships, and c) that solutions are primarily about restoring these relationships." Justin Kenrick, "Commons Thinking: The Ability to Envisage and Enable a Viable Future through Connected Action," in: A. Stibbe, (ed.), *The Handbook of Sustainability Literacy*: 51–57, 52.
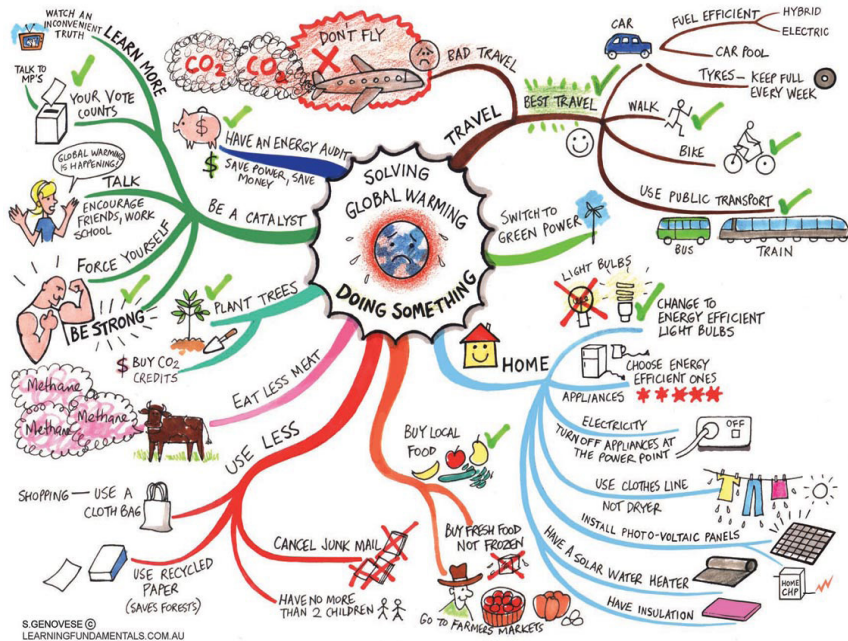
Figure 1: Combating Global Warming Mind Map. Image by Jane Genovese.

of reciprocity and nature connection through five pathways: senses, emotions, meaning, beauty, and compassion.[25]

Of course, we cannot reduce the climate crisis or ecocide to a relationship problem. But any attempt to solve the climate crisis takes accurate scientific knowledge, a systems thinking approach, as well as a relational approach. To protect the environment and meet the SDGs, it certainly takes corporate and governmental responsibility, but any attempt towards social change has to go hand in hand with training sustainability or eco-literacy. To come back to the above-mentioned triad—acting, doing, and being—students could be asked to reflect on their life style choices such as eating (less) meat, buying local food,

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25.   See Maggie Wise, Bruce Martin, Andrew Szolosi & Tamarine Foreman, "Habits of Connection: From Sustainability and Saviorship to Reciprocity and Relationship," *Journal of Experiential Education* 46, no. 2 (2023): 238–255, 239, 245.

saving energy at home, flying (less), and recycling.[26] One exercise could be to critically examine this mind map on how to combat global warming.[27]

But doing or acting is not only about the obvious sustainable choices. It necessitates different ways of thinking. *Doing*—i.e., combatting environmental destruction—involves system *thinking*. In contrast to traditional thinking, systems thinking does not operate with oppositions and dualism. It considers the network of mutually influencing relationships to assess how various components interact forming an integrated whole. This approach depends on transdisciplinary collaborations to also acknowledge the interconnections among various disciplines. While traditional thinking chooses an analytic approach to determine causal relations, systems thinking looks at the bigger picture. Yet, systems thinking is not necessarily the same as Sterling's relational thinking.

What are sustainable ways of *being* and how to teach them? Isabel Rimanoczy's skill-based approach to build a sustainable mindset is instructive in this regard.[28] Out of the 12 principles laid out in her book, I want to introduce seven principles, all of which center on the cultural aspects of sustainability education. The first principle is "ecoliteracy," which teaches students not only about the ecosystem and its interconnections (e.g., the impact of rainforest destruction on

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26.   One input could be to discuss ways to save carbon dioxide using a list the EcoClimate Foundation put together: "If every U.S. family replaced one regular light bulb with a compact fluorescent light CFL, it would eliminate 90 billion pounds of greenhouse gases, the same as taking 7.5 million cars off the road. If you reduce your household garbage by 10 percent, you can save 1,200 pounds of carbon dioxide annually. If you plant a single tree it will absorb approximately one ton of carbon dioxide during its lifetime." See https://ecoclimatefoundation.org/top-10-things-you-can-do-to-reduce-global-warming/.
27.   Jane Genovese, "Combating Global Warming Mind Map," accessible at: https://learningfundamentals.com.au/resources/combating-global-warming-mind-map/.
28.   Rimanoczy, *The Sustainability Mindset Principles*. For more information about Rimanoczy's multidisciplinary academic background (she holds a BA degree in psychology, an MBA, and a doctorate from Columbia University's Teachers College) and ongoing activist endeavour of supporting educators worldwide, see https://www.isabelrimanoczy.net.
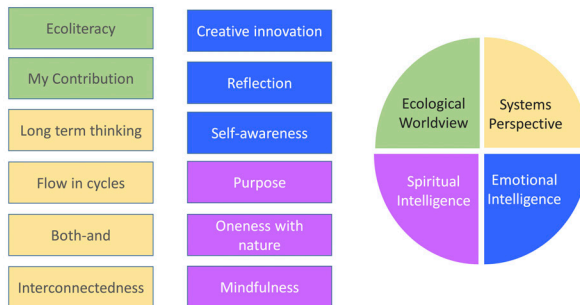
Ecoliteracy	Creative innovation
My Contribution	Reflection
Long term thinking	Self-awareness
Flow in cycles	Purpose
Both-and	Oneness with nature
Interconnectedness	Mindfulness

Ecological Worldview | Systems Perspective
Spiritual Intelligence | Emotional Intelligence

Figure 2: The Four Content Areas of the 12 Sustainability Mindset Principles. Image by Isabel Rimanoczy.[29]

the release of captured CO2), it also seeks to foster students' emotional intelligence and creativity. It aims to equip them with strategies for overcoming self-limiting thoughts and strengthening their intuition. The underlying assumption is that students will only be able to reflect on their mindset and transform it, if they are emotionally stable. Only if they feel somewhat confident, will they reflect on ways to reduce their carbon footprint or other measures to protect the planet—i.e., Rimanoczy's second principle "My contribution." Since many students experience climate anxiety, they have to learn to resist the tendency of giving in to climate pessimism, which usually leads to inaction.

The principle "long term thinking," Rimanoczy links to the "Seventh Generation Principle," first documented at the Iroquois Confederacy (between 1142 and 1500 AD) and their commitment to base any decision-making process on the consideration of whether it can

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29.   Reproduced from Beate Klingenberg & Isabel Rimanoczy, "The Sustainability Mindset Indicator", paper presented at the Eighteenth International Conference on Environmental, Cultural, Economic & Social Sustainability, University of Granada Spain, 26-28 January, 2022, accessible at: https://smindicator.com/conference-presentation-on-sustainability/.

secure sustainable conditions for at least seven generations into the future. In addition to longevity, the "both+ and thinking principle" teaches students to go beyond either/or, dualistic, linear perspectives. To transcend the linear mindset that has driven the economic growth model of profit-seeking agro-industrialization, "both+ and thinking" skills enable students to integrate dualities, challenge hierarchical domination models and accept paradoxes. Principle no. 6, "interconnectedness," manifests in nature's web of organisms but also in the interdependence of humans.[30]

Indigenous cultures across the globe are well aware that humans, animals, and all of nature are connected, but Rimanoczy points out that most spiritual teachings including Buddhism and Taoism presuppose that all beings are interconnected. She defines "a spiritual person [a]s someone who reaches beyond his or her self ... and assumes responsibility for caring about others."[31] In that sense, the spiritual aspect of *being* intersects with personal or corporate attempts to enhance our *well-being*. Principle no. 12 "mindfulness" is key, Rimanoczy suggests, because "being fully present, experiencing connectedness with all that is, enhances awareness and compassion which predisposes to social and environmental actions."[32] In other words, the sustainability mindset model trains ways of being, thinking, and acting that fundamentally challenge the hegemonic non-caring, hyper-individualistic ways.

To conclude, a common denominator of the above discussed pedagogical approaches to sustainability is that relationship skills and a close connection to nature are quintessential. Therefore teachers and students alike must learn how to sustain their own physical and mental well-being to advocate for the well-being of all humans, non-humans, the climate and the planet. To foster a *culture of sustainable development*, we have to acknowledge the basic fact

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30.   While this notion overlaps with the above mentioned "relational thinking" and "commons thinking," its emphasis on emotional skills and human interconnectedness adds a spiritual component to the culture of sustainability.
31.   L.M. English, as quoted in ibid., 162.
32.   Ibid., 194. Rimanoczy cites Frederick C. Tsao & Chris Laszlo, *Quantum Leadership: New Consciousness in Business* (Stanford, CA 2019: Stanford University Press).

of our connectedness as humans (with nature and other humans), practice systems thinking and transdisciplinarity. We need to not just produce solar panels or sign climate treaties but also educate students to question the value system of the Anthropocene.[33] All these pedagogical endeavors, explicitly or implicitly, push towards the Symbiocene promoting a value system based on interconnectedness and stewardship that reintegrates humans and the rest of nature. For that to happen, students and teachers need to learn to become more empathetic, caring, and mindful. For humans to cultivate a mindset that yields sustainable outcomes, we need to learn to *act*, *think*, and, essentially, *be* (i.e. have and live) so that future generations won't suffer from perpetual heatwaves or flooding. In this holistic education for sustainability, academic disciplines such as Cultural Studies, Psychology, and Sociology (will) play a pivotal role.

Students in Sociology or Cultural Studies—including its many sub-disciplines such as Ethnic, Queer, Digital, Film, Game, Women's Studies—have, for decades, been trained in critical media literacy skills, DEI, intersectionality, social and gender inequality. Most students in those disciplines are already aware that advertisement strategies boost mass consumption thereby bolstering the hegemonic culture of environmental degradation. They know that a culture of hyper-individualism and self-branding can harm the wellbeing of the many. Adding to this knowledge base comes the training of critical ecoliterate skills that allows students to question the Anthropocene and prepares them for the Symbiocene. But only a holistic mindset that integrates environmental, social, and psychological proficiency will get us there.

Let me end on an as-if scenario: Even if we were to achieve current climate goals and stop global warming in, let's say, the next six years, heat waves, floods, droughts, and air pollution would have lasting effects. While renewable technologies are quintessential, technological

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33.   See Peter Sutoris's *Educating for the Anthropocene: Schooling and Activism in the Face of Slow Violence* (Camridge, MA 2022: MIT Press), which thoroughly explores the mental world of the Anthropocene. As an educator and environmental anthropologist, Sutoris launched his ethnographic project in India and South-Africa. He encouraged the students to produce self-directed films, allowing them to express their experiences of environmental degradation through representations of their communities.

development alone is not enough to secure a sustainable future. Laws that protect the environment and ensure human rights are needed. Also the recently introduced EU laws mandating companies, multi-national corporations and financial institutions to disclose ESG information are certainly helpful. Yet, in the long run we as a species—and particularly the consumers in the Global North since we are mostly responsible for the environmental destruction—have to develop a holistic *culture* of sustainability. Schools and universities play a vital role in disseminating a value system that substantially transforms the received, ego- and anthropocentric, world view. A thorough reform of education plans, curricula, and teacher trainings will be instructive in spreading the seed for sustainable ways of acting, thinking and being. Who knows, maybe, seven generations down the line we will have become more ecoliterate.

STORIES OF LUTON ROAD

Environmental Justice and Infrastructures of Care and Neglect

Dr Eleanor Jupp

How might university researchers contribute to climate justice in our localities? Last year I collaborated with academics, residents and artists undertaking research on health and environmental issues in an area of Chatham, Kent, near to where my university has a campus. Here I offer an overview and reflections on this project.

Background

I came to the project with an interest in the forms of activism that emerge in the contexts of contemporary crises—environmental, economic and political. In particular, I am interested in how 'care', broadly understood, can be a mobilising force for activism, especially in marginalised communities and places.[1] Recently I have been researching initiatives such as community fridges and pantries to address food waste and food insecurity, and other forms of mutual aid, as 'hyperlocal' responses to overlapping crises. Foregrounding care in relation to environmental initiatives underlines the need to challenge

1.　　　E. Jupp, *Care, Crisis and Activism: The Politics of Everyday Life* (Bristol, 2022: Policy Press).

purely 'technoscientific' solutions[2]—and pay attention to the affective, ethical and political affordances of tools for transition, if we are to have a critical approach to environmental justice.

Indeed, in my thinking on care and climate justice I am particularly influenced by the work of María Puig de la Bellacasa—and her engagement with a wider range of science and technology studies.[3] This involves thinking through care in 'more-than-human' worlds or 'natureculture'.[4] Care, in Puig de la Bellacasa's work, drawing on Tronto's theorisation,[5] always involves practices, affects and ethics or 'hand, brain and heart',[6] offering a feminist approach to engagement with the terrains seen as dominated by natural sciences.

For this project, rather than a critical account of existing interventions, our engagement on Luton Road in Chatham, Kent, approached technology differently—to consider how digital technology (and its affective qualities) can be used to give voice to residents of a neglected and stigmatised neighbourhood. Overall, it considers how a care-full approach to technology can actively contribute to a critical climate justice.[7]

Stories of Luton Road

For the project I collaborated with other researchers at the University of Kent—Kate McLean, Becky Alexis-Martin, and Elise Wynkoop. The digital visualisations produced were created by artist Kevin Grist and

2.	A. Martin, N. Myers & A. Viseu, 'The Politics of Care in Technoscience', *Social Studies of Science* 45, no. 5 (2015): 625-641.
3.	M. Puig de La Bellacasa, *Matters of Care: Speculative Ethics in More Than Human Worlds* (Minneapolis, MN 2017: University of Minnesota Press).
4.	D. Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature* (London 2013: Routledge).
5.	J.C. Tronto, 'An Ethic of Care', *Generations: Journal of the American society on Aging*, 22, no. 3 (1998): 15–20.
6.	H. Rose, 'Hand, Brain, and Heart: A Feminist Epistemology for the Natural Sciences', *Signs: journal of Women in Culture and Society* 9, no. 1 (1983): 73-90.
7.	M.J. Williams, 'Care-full Justice in the City', *Antipode* 49, no. 3 (2017): 821-839; F. Sultana, 'Resplendent Care-full Climate Revolutions', *Political Geography* 99, no. 1 (2022): 102638.

colleagues at Electric Medway (https://www.electricmedway.org/), working within community arts organisation Ideas Test (https://ideastest.org.uk/). We also worked with community organisation Arches Local (https://archeslocal.org.uk/)—as well as local residents themselves.

The Luton Road area in Kent is a stigmatised road in a wider post-industrial urban area, Chatham, which is in itself also stigmatised.[8] It is a mile-long road in an area of high crime, deprivation, and poor health—not an area necessarily thought about in terms of climate justice. The initial framing of the project was to be about addressing health inequalities. It became clear when talking to local government officials that health concerns for the area could actually contribute to senses of stigma, within discourses of individual 'behaviour change'—for example, how to tackle obesity, smoking, and 'unhealthy choices'.[9] I would argue that this discourse is itself a symptom of austerity, whereby tackling poverty and inequality as wider determinants of health are out of reach in a context of reduced budgets.

However, when we began talking to residents, they engaged us in discussions about air pollution, poor lung health, and asthma due to a car dominated environment, in the context of a wider neglect and lack of care for the area among decision makers, and feelings of fear and risk in public spaces. There is very poor air quality in particular.[10] The neighbourhood is subject to statutory air quality monitoring, but there were feelings of despair among the residents about this improving. Luton Road is a very busy road that leads to other more affluent areas and the sense of the road as somewhere to pass through is the dominant way it is discussed among local decision makers. 'Levelling up' money is being spent on improving the nearby town centre shopping environment but not on Luton Road.[11] Indeed, in

8.　　　Keely Greenwood, 'Our reporter visits Luton, Chatham, after area is slammed in survey', *Kent Online* 22 February 2023, https://www.kentonline.co.uk/medway/news/despite-what-people-say-its-just-not-that-bad-282555/.
9.　　　R. Jones, J. Pykett, & M. Whitehead, 'Behaviour Change Policies in the UK: An Anthropological Perspective', *Geoforum* 48 (2013): 33-41.
10.　　　Medway Labour, 'Medway Labour motion to declare Climate Emergency', 12 April 2019, https://www.medwaylabour.org.uk/medway-labour-motion-climate-emergency/.
11.　　　Medway Council, 'Medway to receive nearly £14.5million government

thinking about the role of universities in tackling climate crisis, there is a need to be aware of the potential for researchers to be drawn into a largely neoliberal politics of dominant local political discourses and decision-making.

Spending time on the Road as researchers, we became aware that it is a multicultural area, with many fairly recent migrants as well as a longer established working-class white population connected to work at the nearby Dockyard. Along the road are large Victorian houses which have mainly been divided up into flats and are neglected. Much housing was owned by private landlords operating at the 'edges' of the welfare state providing temporary and supported housing.[12] Overall it feels like an unregulated environment where the state and wider forms of care are largely absent. Residents spoke to us about tensions and pressures experienced including racism, violent crime, a lack of meeting places, and a lack of wider infrastructures of care. One of the most visible symptoms of neglect is the presence of rubbish and fly-tipping, indicating a lack of basic infrastructure around rubbish collection. Such neglect clearly links to austerity.

However, residents do care about and care for their road within this wider context of neglect. We therefore wanted to use the research to challenge dominant understandings of the Road—and to bring centre stage what it is like to live there, to walk along it, and the hopes and fears of residents. We walked along the Road with fifteen diverse residents undertaking in-depth 'go-along' multi-sensory interviews, as well as attending local events. This process involved collecting audio stories, sounds, images as well monitoring air quality. My colleague Kate McLean made collaborative 'smell maps' through walks to collect smells on the road.[13]

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funding', 28 October 2021, https://www.medway.gov.uk/news/article/1037/medway_to_receive_nearly_145million_government_funding.

12.   E. Jupp, 'Affective Geographies of Governance and Care in the Fraying Welfare State', unpublished working paper.

13.   C. Perkins & K. McLean, 'Smell Walking and Mapping' in: H. Holmes & S.M. Hall (eds.), *Mundane Methods* (Manchester 2020: Manchester University Press): 156–173.

Figure 1: Interactive Luton Road visualisation. Image by Electric Medway.

In spending this time and attention on the Road, we were seeking to enact caring for 'neglected things'.[14] We wanted to collectively attune ourselves to the environment of the Road in new ways, and then use the affective affordances of a digital environment to communicate this attention and care for others. Artist Kevin Grist (https://www. electricmedway.org/) enabled us to present our research data in this multi-sensory way, using a digital environment in which viewers can listen to voices of residents mapped onto images and words, and can 'explore' in the way viewers might explore platforms such as Google Streetview. This technology allowed us to animate interview data alongside the sounds and sights around which it was generated. The visualisation therefore seeks to provide a platform and intervention into local decision making about the road.

Figure 1 is one image from this visualisation, highlighting themes of air pollution and risks to health.

Discussion of air pollution was tied up with wider feelings about an unsafe and unhealthy environment and of fear and risk, especially for children. These feelings in themselves contribute to car use among local residents—although many people driving along the road are not residents. Nonetheless, it is important to note that aspirations, hopes, and positive experiences of community and friendship were discussed

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14.   Puig de La Bellacasa, *Matters of Care*.

during interviews too. These included positive feelings about planting trees and flowers and creating more green spaces—both in the present and aspired for in the future.

Conclusions

In researching on Luton Road it became clear that environmental justice needed to be placed within a wider context of austerity and failures of care—involving housing, planning, and welfare. Within a neglected, stigmatised, and fearful public sphere it becomes harder to move away from car dominance in particular. This prompts us to consider who is seen to deserve having their environment and health protected? When we talk about environmental justice, who is included? A project such as this experiments with a phenomenological politics of attention to engage with climate justice,[15] in which digital technology can play an important role. More broadly, issues such as air quality, carbon emissions, and rising temperatures can be largely invisible. In certain times and places they may become highly visible—but then dominant attentions can be quickly pulled elsewhere. Our methods involved slowing down residents' attention as well as our own as researchers, and as viewers of the digital environment. Going into digital environments can enable an experiential immersive involvement in place, and there is more to consider around how such environments can draw attention within a critical climate justice framework more widely.

As already noted, hopeful feelings on the road centred around a scheme to plant trees a few months earlier. We were told that the project had been resisted as officials thought they would be vandalised, within a wider set of feelings that environmental improvements were not 'deserved' on the Road. However, this had not happened, and as well as contributing to improving air quality, the trees provided a connection to nature that residents often craved. Even more powerfully, they provided an example of something changing and an antidote to despair.

15.   D. Seamon, 'Lived Bodies, Place, and Phenomenology: Implications for Human Rights and Environmental Justice', *Journal of Human Rights and the Environment* 4, no. 2 (2013): 143-166.

Figure 2: Interactive Luton Road visualisation. Image by Electric Medway.

CLOSE READING CLIMATE CHANGE (CRCC)

A Working Protocol

Dr Bridget Vincent, Dr Luseadra McKerracher & Dr Janet Rafner

This paper outlines the rationale and protocol for a new interdisciplinary research project titled Close Reading Climate Change (CRCC). Our starting point lies in the close reading classroom, in which small groups of literature students are given an unseen poem and then see, collectively, what they can make of it. This experience is, fundamentally, one of uncertainty: developing an interpretation individually and together requires students to acknowledge and articulate what they don't understand: to identify and work with, rather than around, the text's ambiguities. Done right, the close reading classroom creates a space in which people who are elsewhere required to have all the answers can sit with the vulnerability of ambivalence: their own and each other's. We hypothesise that this classroom environment, with its manifestation of shared uncertainty, offers a space in which people (students and non-students alike) might explore other manifestations of uncertainty: particularly those we find hard to discuss otherwise, such as the allocation of moral

responsibility around climate change. With this mind, we outline a mixed methods plan to evaluate this hypothesis, focusing on climate change responsibility and complicity, across two core sites in different cultural contexts—Australia and Denmark. We also note further plans to explore the efficacy of the CRCC approach at a smaller scale in two additional contexts: Canada and Norway.

Climate responsibility: A difficult conversation

As members of nation states, organizations, and even families, many of us struggle to talk productively about individual responsibility and collective climate guilt. This guilt constitutes what Pitt and Britzman call "difficult knowledge", in that it involves not only interpretative difficulty but also psychological confrontation.[1] Research by Vanderheiden, similarly, highlights the larger difficulties of disentangling individual from collective responsibility for climate change.[2] As Michael Maniates has shown, our shared understanding of the individual-collective climate responsibility dynamic has long been shaped by the phenomenon of "individualization", which inaccurately frames climate responsibility as primarily a matter of personal, particularly consumer, choice.[3] The interpersonal difficulties of discussing climate responsibility frequently come back to the relationship between individual and collective agency, captured in Michael Rothberg's category of the 'implicated subject' (as against direct individual agent). This "difficult knowledge" (about the relationship between individual and collective climate agency) results in "difficult conversations": interactions characterised by defensiveness, deflection, and denial of individual climate responsibility. This project asks: could setting up a non-specialist version of the close reading classroom (i.e., outside the university degree environment) create a space for better conversations

1.	A. Pitt & D. Britzman, 'Speculations on qualities of difficult knowledge in teaching and learning: an experiment in psychoanalytic research', *International Journal of Qualitative Studies in Education*, vol. 16 (2003): 755-776.
2.	S. Vanderheiden, 'Climate change and collective responsibility', in: N.A. Vincent, I. van de Poel & J. van den Hoven (eds.), *Moral Responsibility: Beyond Free Will and Determinism* (Dordrecht 2011: Springer): 201-218.
3.	M. Maniates, 'Individualization: Plant a tree, buy a bike, save the world?', *Global environmental politics* 1, no. 3 (2001): 31-52.

in which we engage with the difficulties of environmental complicity, rather than becoming defensive about them?

In asking this question, the project participates in a research tradition which explores the value of adding an external point of focus to group conversations. This tradition has involved such diverse models as: using a physical object as a point of focus in a workshop; using book clubs and reading groups to talk about social questions; using shared art-making experiences as a way to scaffold conversations; and walking-based workshops, in which the landscape itself acts as the external focus.[4] Underlying all of these exercises is the suggestion that the focus on an object beyond the other people in the conversation can allow for forms of dialogue to take place that would not be possible without this triangulation of conversational attention and the interactional 'valve' it offers.

Existing environmental humanities research shows the value of promoting climate conversation and engagement via texts through book clubs and reading groups. Research in climate communication (particularly in empirical ecocriticism)[5] has experimented with text-based climate discussions involving book clubs, classrooms and reading groups. Research also exists on climate and the close reading classroom but focuses largely on pedagogical goals.[6] These groups have had encouraging results but their focus has been largely content

4. S.F. Akkerman & A. Bakker, 'Boundary crossing and boundary objects', *Review of educational Research*, 81, no. 2 (2011): 132-169; M.L. McKittrick, 'Climate Change Games as Boundary Objects: Moving Toward Dialogic Communication in Stakeholder Engagement', in: M. Trice, D. Johnson Sackey & C. Welhausen (eds.), *Proceedings of the 40th ACM International Conference on Design of Communication* (New York 2022: Association for Computing Machinery): 32-41; M. Poutiatine, *Finding common threads: Selected summary of the research on the courage to teach program and the process of teacher formation* (Bainbridge Island, WA 2005: Center for Courage and Renewal).
5. M. Schneider-Mayerson, '"Just as in the Book"? The Influence of Literature on Readers' Awareness of Climate Injustice and Perception of Climate Migrants', *ISLE: Interdisciplinary Studies in Literature and Environment*, 27 (2020): 337–364.
6. P. Myren-Svelstad, 'Exploring Poetry in Dialogue: Learning as Sustainable Development in the Literary Classroom', *ISLE: Interdisciplinary Studies in Literature and Environment* (2023), DOI: 10.1093/isle/isad003.

guided, focusing on books that are in some way about climate. What remains unexplored is the benefit afforded by the procedures of shared textual analysis (and its attendant collective uncertainties) in the context of climate conversations. How, this project asks, might the specific processes of close reading literary texts promote new forms of dialogue?

Uncertainty in the close reading classroom

The processes of the close reading classroom require participants to examine a short unseen text (usually a poem) and together develop a shared analysis based on individual observations, insights and, crucially, interpretative ambiguities. This inherent focus on the lack of mastery and on uncertainty is key to its social potential here, as it creates an environment of shared vulnerability. The role of uncertainty itself in literary reading has been well-documented, receiving substantial examination by literary critics and philosophers, from Wolfgang Iser, with his grounding work on indeterminacy and reader-response theory, to a recent critical anthology titled Literary Theories of Uncertainty edited by Mette Leonard Høeg, through Marjorie Perloff's influential The Poetics of Indeterminacy and Hans-Georg Gadamer's accounts of indeterminacy in aesthetic experience.[7] Here we draw on C. Namwali Serpell's model of uncertainty, which stresses, citing the OED, that "while its kin terms (ambiguity, difficulty, indeterminacy) tend to get attributed solely to the literary object, uncertainty can refer to either the object or the cognitive state of the observer. It is the quality or 'state of not being definitely known' or 'the state or character of being uncertain in mind.'"[8]

Various researchers have also examined the later effects of encountering literary uncertainty. As Cori Ann McKenzie and Geoff

7.   W. Iser, *The Act of Reading: A Theory of Aesthetic Response* (Baltimore 1978: Johns Hopkins University Press); M. Høeg (ed.), *Literary Theories of Uncertainty* (London 2021: Bloomsbury); M. Perloff, *The Poetics of Indeterminacy: Rimbaud to Cage* (Evanston 1981: Northwestern University Press); H. Gadamer, *The Relevance of the Beautiful and Other Essays* (Cambridge 1986: Cambridge University Press).
8.   C.N. Serpell, *Seven Modes of Uncertainty* (Cambridge, MA 2014: Harvard University Press), 9.

Bender have shown, "a literary experience is an orientation to reading that fosters 'uncertainty, openness, and imagination' through the exploration of unresolvable questions and textual uncertainties."[9] Accordingly, as Kim Devereaux, drawing on Dyutiman Mukhopadhyay, shows, literature "can change our minds by enhancing our tolerance for uncertainty."[10] In exploring the value of specifically literary uncertainty, the project participates in a larger tradition of uncertainty research developed by Attard and Lane and Maxfield around what Stijn Bollinger calls "uncertainty competence".[11] Of particular relevance is the Professional Uncertainty Competence project developed by Mette Risgaard Olsen and Susanne Østergaard Olsen. The Olsen study also offers useful methodological grounding in offering an example of a demonstrated framework for measuring uncertainty in an educational context, and by offering specific models of uncertainty itself, developed by Muukkonen and Lakkala, Tracey and Hutchinson, and Hillen et al.[12]

Study Objectives

We aim to explore what kinds of climate discussions develop when participants experience this interpretative uncertainty and are

9.   C. McKenzie & G. Bender, 'The call of ambiguity: lingering over uncertainty as classroom practice,' *English Teaching: Practice & Critique* 20, no, 1 (2021): 51-63, 52.

10.   K. Devereux, 'Embracing Uncertainty: How literary writing helps us change our minds', *Frontiers of Psychology* 13 (2022): 1–7.

11.   K. Attard, 'Uncertainty for the reflective practitioner: a blessing in disguise', *Reflective Practice* 9 (2008): 307-317; D.A. Lane & R. Maxfield, 'Foresight, complexity and strategy', in: Arthur, Durlauf & Lane (eds.), *The Economy as a Complex Evolving System* (Boca Raton 1997: CRC Press); S. Bollinger, 'Develop your PUNC with the Professional UNcertainty Competence Framework' (2022), accessible at: https://www.eaaa.dk/media/msxh0ovr/develop-your-punc-with-the-professional-uncertainty-competence.pdf.

12.   H. Muukkonen & M. Lakkala, 'Exploring metaskills of knowledge-creating inquiry in higher education' *Computer Supported Learning* 4 (2009): 187-211; M. Tracey & A. Hutchinson, 'Uncertainty, reflection, and designer identity development', *Design Studies* 42 (2016): 86-109; M.A. Hillen, C.M. Gutheil, T.D. Strout, E.M.A. Smets & P.K.J. Han, 'Tolerance of uncertainty: Conceptual analysis, integrative model, and implications for healthcare', *Social Science & Medicine* 180 (2017): 62-75.

prompted, through specific discussion questions, to reflect on the relationship between this textual uncertainty and their own lived uncertainties around collective climate responsibility. Further, we will evaluate predictions from our core hypothesis, which holds that the interpretative experience of uncertainty will prime participants to hold more constructive discussions around climate relative to pre-workshop baselines.

Study Design

We will use a within-participant study design wherein up to 1000 participants in groups of approximately 6-12 each will attend a minimum of two and a maximum of five 75-90 minute workshops. Each workshop will be composed of two sections: a close reading section and a climate uncertainty discussion section. Half the participants will complete the discussion before the close reading: half will complete the discussion after it. It is by comparing the two groups that we will assess whether exposing a group to the experience of the close reading classroom affects that group's later discussion of climate uncertainty. Accordingly, as often as possible, groups will be recruited and organised in matched pairs or small sets based on socio-demographic composition. The order of the two tasks will be randomised between pairs/sets of groups.

This project is being developed in partnership with collaborators in four countries—alphabetically, Australia, Canada, Denmark and Norway—and will be implemented in one or more municipalities or geopolitical regions (e.g. states/provinces) in each. This cross-national perspective will allow us to assess the extent to which the method and its implications and applications are likely to be specific to particular cultural, economic, linguistic, and especially socio-political contexts. The core settings, however, are Australia and Denmark, and the protocol description (particularly details relating to expected sample sizes, randomization strategies, and power calculations) hereafter refers to the Australian and Danish sites.

The guided climate discussion section

The discussion task will comprise a facilitated conversation about individual and collective strategies for mitigating climate change and its impacts and, more specifically, about participants' feelings of responsibility related to climate change and climate change mitigation (with focus on feelings related to experiencing uncertainty and to experiencing empowerment). The facilitator will open the climate change discussion by inviting participants to reflect individually in silence and write down some brief bullet points about how they experience uncertainty in relation to climate change and, in particular, in relation to their own sense of individual, organisational, and collective climate responsibility and agency. After this reflection, participants will be invited to share their individual reflections. Here the facilitator will explicitly acknowledge (using a set prompt) that this is something we all often find hard to think and talk about, and that disagreement might come up. The facilitator will explicitly request that participants vocalise their feelings of disagreement, and that this vocalisation is central to the exercise—the aim is not to keep the peace but to create a productive and respectful structure for disagreement. Specifically, participants will be requested, when they bring up an area of disagreement, to reflect explicitly on the uncertainties they experience in relation to this disagreement.

The close reading section

The close reading component will involve a literary scholar guiding participants through the process of analysing a previously-unseen poem or short piece of prose, selected for its power to elicit feelings of uncertainty and ambiguity through interpretative difficulty. The structure of the close reading workshop is based on the conventions of the close reading workshop used in university literature classrooms, but adapted for participants who do not have specific training in literary analysis. Here we will retain the close reading classroom's focus on developing an interpretation of the text (rather than reading wholly open-endedly) and the classroom's attendant emphasis on articulating uncertainty as part of this process.

Each participant will be provided with a printed copy of a poem and encouraged to write on their copy. This annotation process is important to the structure of close reading workshops and also provides the researchers with data about participants' individual interpretative processes. At the beginning of the close reading part of the workshop, the facilitator will read the poem aloud (following close reading classroom conventions) and participants will be explicitly directed to follow along on their copies and to participate in a process of open-ended noticing, in which they underline or note down anything about the poem they notice as they read or listen. Importantly, they will be explicitly directed, from the outset, to focus on areas of ambiguity, indeterminacy, ambivalence, and uncertainty. How is this lack of understanding related to our enjoyment of the poem? Participants will therefore be primed from the beginning to focus on uncertainty and ambiguity as explicit talking points, rather than to feel that producing interpretations necessitates ignoring or working around difficulty.

After the initial reading and listening moment, participants will be given five minutes to sit with the text on their own in silence and make specific notes on aspects of the poem they find interesting or important, here too with a specific view to uncertainty. Participants, being in most cases new to the experience of the close reading workshop, will then be advised by the facilitator that one of the key aims of the experience is to develop an interpretation together, based on the individual responses. The facilitator will emphasise that putting these together involves practising how it feels to acknowledge and hold space for uncertainty rather than needing to resolve it. The participants will then, mediated by the facilitator, spend fifteen minutes discussing the poem and sharing these uncertainties in the process of coming up with multiple interpretative possibilities.

Participants from those groups who complete the close reading section of the workshop before the discussion section will be encouraged to keep reflecting on whether/ how their experience of participating in the discussion about climate change responsibility may be being shaped by their earlier experiences of discussing uncertainty in relation to the texts.

Evaluation of intervention

To assess the efficacy of our close reading intervention, we will evaluate discussion quality both quantitatively and qualitatively. Each discussion will be observed by a member of the research team (most often a research assistant), who will take detailed, ethnographic notes on: the extent to which participants voice their opinions and perceptions within each session, the speed with which the group members begin to express their feelings and share their stories, the extent to which feelings of uncertainty and ambiguity arise in the discussion, and the tenor and mood of the discussion, including the ethnographer's on-the-fly assessments of the relative frequency of negative, accusatory, or defensive versus positive, supportive, and solution-oriented discursive content. Furthermore, we will conduct rapid individual interviews (after the first and last workshops in a series) about participants' experiences, feelings, and perceptions of the close reading discussion experience and of their possible roles in mitigating climate change. Interviews will be conducted via telephone, videoconferencing (e.g. Zoom), or email (according to participants' preferences) by a member of the research team with subsets of participants from each group until theme saturation is reached. Phone/video interviews will be recorded and transcribed.

As a quantitative proxy for discussion quality (on the assumption that high-quality discussions will affect the views and experiences of participants), we will evaluate individual-level changes in attitudes, perceptions, and feelings through a combination of: 1) a repeated questionnaire administered immediately before the first workshop, immediately following Task 1 (the facilitated discussion), and one week after the last workshop in the series; 2) a single-word emotional affect monitoring task[13] administered repeatedly (6 times) over the course of each workshop (participants will be asked to report on a slip of paper pre-labelled with their study ID# which emotional state out of a list of eight emotional states best describes how they are feeling "right now", and then to place that slip of paper in a pre-labelled envelope); and 3) monitoring of emotional arousal over the duration of the workshop

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13.   L. Barrett, L.R. Feldman, P.R. Pietromonaco & K.M. Eyssell, 'Are women the "more emotional" sex? Evidence from emotional experiences in social context', *Cognition & Emotion* 12, no. 4 (1998): 555-578.

using a wearable electrodermal resonance measurement device. The ~15 minute questionnaire includes six components: 1) a socio-demographic component (age, gender, level of completed education, first language, country and postal code of residence, living/housing situation, indicators of socio-economic position/stress); 2) a 5-item big five personality assessment scale; 3) a Cantril ladder, 4) a 1-item self-perceived overall health scale, 5) a 10-item environmental self-efficacy scale, 6) a 10-item climate change worry scale, 7) a 12-item uncertainty competence scale, and 8) a 4-item measure of personal climate responsibility; the first four components will only be administered once, immediately prior to the first workshop in a series. In developing these instruments, we draw on research about validated instruments for climate perception by Valkengoed, Steg, and Perlaviciute and climate responsibility by Munson et al.[14]

Meeting notes, observations and interview texts/transcripts will be analyzed using a semi-inductive iterative approach, with expected global themes to be derived from the workshop and interview guides and with further global and basic themes anticipated to arise through reading and coding of notes and texts/transcripts. Coding will be done using NVivo qualitative analysis software. Within-participant changes in self-reported emotional affect, emotional arousal, environmental self-efficacy, climate change worry and responsibility, and uncertainty over the course of the intervention will be assessed using multi-level mixed models adjusted for socio-demographic factors, with responses clustered by pair or set of groups; the main fixed effect will be order of the tasks.

Given our within-participant and matched-groups study design (with randomised order of the tasks), to sufficiently power (at P=80% and expected effect size of 0.4), we must receive complete responses from a bare minimum of 100 participants per site for our quantitative analyses. The complexity of our design and the diversity of our anticipated participants also mean that the qualitative assessments will

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14.   A.M. van Valkengoed, L. Steg & G. Perlaviciute, 'Development and validation of a climate change perceptions scale', *Journal of Environmental Psychology* 76 (2021): 101652; S. Munson, J. Kotcher, E. Maibach, S.A. Rosenthal & A. Leiserowitz, 'The role of felt responsibility in climate change political participation', *Oxford Open Climate Change* 1, no. 1 (2021): kgab012.

require, per site, a minimum of ~100 participants organised into at least eight groups before we expect to reach saturation on key themes. To accommodate some anticipated attrition, we aim to recruit a minimum of approximately 150 participants, although we will continue recruiting up to 1000 per site, if financial and personnel resources permit.

Interdisciplinary implications

The context and reach of the research is not only international but also interdisciplinary: we aim in later iterations to use our close-reading workshop model to scaffold further discussions about complicity in other contexts in which uncertainty makes for difficult conversations (in such uncertainty-defined fields as AI development) and application as a public engagement and knowledge translation tool (the research focus of one of the co-authors, Dr Janet Rafner)[15] and prevention and management of chronic diseases (the research focus of another co-author, Luseadra McKerracher), thereby drawing on the diverse national and disciplinary expertise of the investigation team.

Ultimately, the project's aims are both investigative and interventional. The project is investigative in that we aim to use the close reading workshop format to enable a conversation about why discussions about complicity and collective responsibility hit roadblocks, and what would help remove these roadblocks. It is interventional in the sense that the workshops themselves aim to act as a space for conversations about complicity. We aim for the workshop project to be

15.   See J. Rafner, S. Langsford, A. Hjorth, M. Gajdacz, L. Philipsen, S. Risi, J. Simon & J. Sherson, 'Utopian or Dystopian?: Using a ML-assisted image generation game to empower the general public to envision the future', in: *Proceedings of the 13th Conference on Creativity and Cognition* (2021); J. Rafner, B. Zana, T. Beolet, S. Buyukguzel, E. Michel, N. Maiden, S. Risi & J. Sherson, 'Crea.visions: A Platform for Casual Co-Creation with a Purpose Envisioning the Future through Human-AI Collaboration with Multiple Stakeholders', paper presented at the 14th International Conference on Computational Creativity, 19-23 Jun 2023, Waterloo, Canada, accessible at: https://openaccess.city.ac.uk/id/eprint/30700/; J. Rafner, B. Zana, P. Dalsgaard, M.M. Biskjaer & J. Sherson, 'Picture This: AI-Assisted Image Generation as a Resource for Problem Construction in Creative Problem-Solving', in: *Proceedings of the 15th Conference on Creativity and Cognition* (2023): 262-268.

about productive climate complicity discussions, and to be an instance of these discussions.

"SI DICE ACQUA"

Podcasting as a Research and Pedagogic Method to Nurture Relations on Water, Climate, and the Commons

Dr Emanuele Fantini

I n September 2019 I was watching the images of Fridays For Future's climate strike in my home town, Turin (Italy). Around the same time I also took my 9- and 7-year-old daughters to their first climate marches in The Hague (The Netherlands), close to where we live. Looking at this new generation of climate activists, I realised that most of those youths were still in primary school – or even kindergarten – when another relevant mobilisation took place in Italy: the mobilisation against the privatisation of water services led by the Italian water movement. This has been one of the most relevant political mobilisations in Italy over the last 20 years.

The Italian water movement and the commons

That movement reached its peak and most iconic victory in June 2011, when they won a national referendum against the privatisation of water services, in the name of water as commons. To many, that victory looked rather unexpected. In the twenty-four referendums held in Italy since 1997 the required quorum of 50%+1 of the voters had not been

attained. Political parties did not actively promote the referendum, and joined the campaign only in the very last days for opportunistic reasons. Similarly, mainstream media neglected or explicitly silenced public discussion of the referendum's topics. Nevertheless, the turnout reached 55% of the voters with an overwhelming majority (95%) of yes to the two referendum's questions: the first asked to abolish the obligation for local authorities to contract out the local public services to companies (public, private or mixed); the second asked to abolish the 7% profit rate that was included in the water services tariff. Combined together, these two questions, according to the proponents of the referendum, would have put a halt to the privatisation and corporatization of water services in Italy.

The success of the 2011 referendum inspired other political and social movements that wanted to emulate the success of the water movement. Traditional struggles, for labour or public education, began to be framed as struggles for the commons. Everything became a commons: libraries, the internet, soil, you name it. Some were discussing the opportunity of creating a "commons party" to compete in national and local elections. Several municipalities introduced the post of "councillors for the commons". Theatres and other buildings were occupied and transformed into commons. Articles and books on the commons flourished in cultural and academic debates. There were of course many different understandings of the very notion of the commons: one of the most original, that became popular in the aftermath of the referendum, considered the commons as way of governing and managing resources alternative to the logics of both the neoliberal market and the top-down state.[1]

Podcast as a research method during lockdown

Ten years later, observing the campaigns of contemporary climate movements, I was thinking that the experience of the water movement may be inspiring, particularly because they managed to build a vast coalition of groups and organisations, ranging from Catholic parishes to radical left-wing activists of what used to be called the No-Global

1.   Chiara Carrozza and Emanuele Fantini, "The Italian water movement and the politics of the commons," *Water Alternatives* 9, no. 1 (2016): 99–119.

movement. Therefore, in 2020, during the lockdown, I decided to go back to a previous piece of research we did on the Italian water movement right after the referendum.[2] This new research asked two questions: where have all the commons that mushroomed after the water referendum gone ten years later? And what can we learn from the experience of the water movement to address the Corona and Climate crisis?

I contacted the key informants – activists, journalists, representatives of local governments, colleagues who were also part of the movement – and through them I also met new ones, and I recorded online semi-structured interviews. I decided to make a podcast, which I used both as a research and communication tool. Why? First, because I had already done one, on the Nile river, and it was a lot of fun. Second, because during the lockdown this seemed to me an effective medium to conduct and disseminate research.[3] The results of this research have been published in the podcast "Si dice acqua"[4] (translation: It's called water) that recalls one of the mottos of the movement, "It is written water, it is read democracy". What did I learn from this research? And, more importantly, what might the climate movement learn from the Italian water movement? These are a few of the lessons that the activists shared in the different episodes of the podcast:

1. Start with culture and education. The victory of the referendum of 2011 was made possible through a capillary activity of education and cultural sensitisation that started ten years earlier, at the beginning of the water movement in Italy, with the idea of promoting a new culture about water, through photo exhibitions, activities with schools, and artistic collaborations. Such grassroot and often unnoticed activities strengthened a broader understanding of water as a fundamental human right and commons in the Italian public opinion.

2.   Chiara Carrozza and Emanuele Fantini, *Si scrive acqua… Attori, pratiche e discorsi nel movimento italiano per l'acqua bene commune* (Torino 2013: Accademia University Press).
3.   For more on the podcast as research method see Emanuele Fantini, "Ascolto, montaggio, condivisione: il podcast come metodo di ricerca e relazione," in: Massimo De Marchi, Silvia Piovan & Salvatore Pappalardo (eds.) *Atti del XXXIII Congresso Geografico Italiano*, Vol 5. pp. 422-427.
4.   The six episodes of the podcast (in Italian) are available at https://sidiceacqua.hypotheses.org/ and on Spotify.

2. Use an accessible and inclusive language. In order to speak to and build a vast and plural coalition, several left-wing activists reflected on how they learned to avoid the ideological jargon they used to adopt in previous struggles. Similarly, engaged scholars had to abandon academic or disciplinary jargon to contribute to the mobilisation with their technical knowledge.

3. Adopt a radical message. As counterintuitive as it may sound, the vast coalition in support of the referendum was not cemented through a watered-down message resulting from a compromise between the different worldviews present in the movement. On the contrary, it rallied behind a bold and radical message: water is a commons, it is not for sale and should not be commodified.

4. Connect local and global scales. The water movement managed to conduct and win local battles about local water services and resources in Italy. At the same time, it was able to connect those battles to the global movement advocating for the right to water and water as commons in international fora like UN Conferences or the World Water Forum and, through this movement, join local struggles like those of indigenous movements in Latin American countries like Bolivia or Argentina. This allowed people both to feel part of a global movement and see the practical effects of that movement at home, in their local territory.

5. Ally with local governments. Several of these victories were achieved through an alliance between social movements and local governments. The latter are often more advanced and progressive than the national governments, particularly on issues like water or climate change, whose problems, impacts or consequences manifest mostly at a local level.

Podcasting in education

I would like to conclude by sharing what I learnt unexpectedly, in terms of the process of podcasting as a research method and how I am now applying that in education.

Our institute offers Master and PhD programmes for what we call mid-career water professionals. These are people with previous working experience in public administration, private sectors, NGOs, in African, Asian and Latin American countries coming to the Netherlands to get exposed to what is often called the "Dutch water knowledge". Most of these students have a technical background – engineering or hydrology – and they wish to learn more about the governance and management dimensions of water. In two of my courses I asked them to work in groups and to make a podcast as their final assignment, to practice some of the competences on communication and interdisciplinarity that are central to education for sustainable development. What I am trying to develop is a podcast pedagogy that revolves around voice. A modest and pragmatic project, to reflect on how I as a teacher can contribute to addressing the climate crisis.

The first element is listening to the voice of your interlocutor. I have learnt that interviewing someone for a podcast is a very effective way to learn and practice active listening. First of all, interviewing someone for a podcast implies a recognition of their knowledge and authority: your interlocutor deserves to be publicly listened to. Second, as host you learn to ask better questions, to assess when to remain silent or when to ask a follow-up question. Third, you have to paraphrase and summarise for your audience. Active listening is crucial for water professionals and by doing the podcast I hope that my students can learn how to better listen to local farmers, water users, or children, indeed any person they aspire to serve.

The second element is about editing, or listening to your own voice as author. Editing is a very delicate and sensitive political act. You are, quite literally, adding or removing voice. The author should be accountable for that, for instance by signposting and summarising for the audience. Listening to your voice offers also the opportunity for reflecting on your own practice. And reflexivity is key to educating water professionals such as hydrologists or engineers that are able to critically assess the social and political implications of technology and infrastructures.

The third element is about sharing the podcast, or listening to the voice of your audience. Podcast is an intimate, one-to-one medium that

requires an active engagement and a relatively long time commitment in terms of attention by the listener – especially if compared with scrolling through posts on social media. How do you reward such engagement? Podcasting requires thinking about your audience: How can you reach them? How can you collect their feedback and use it to improve your work? Reflecting on these questions, the students learn and practice how to build and nurture relations through their communication.

Active listening when interviewing; reflexivity when editing the podcast; caring for relations when sharing it with your audience. These three elements of a podcast pedagogy are particularly relevant in education for sustainability on topics like water or climate change. Podcasting is a medium that allows to effectively nurture relations in research and education by creating spaces for dialogic conversation. This property seems coherent with the lessons learned by the Italian water movement: the need to connect people, problems, institutions, and scales by adopting a creative, radical and simple communication style. Similarly, a podcast pedagogy can inform and inspire our education activities to nurture critical and creative minds to address the climate crisis.

This issue features:

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