

Teaching in the Anthropocene: Navigating Educational Realities in Times of Crisis

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SWISP Lab's vision is to transform society by mediating complexities that others cannot, using speculative thinking to shape public consciousness in and for education futures in the midst of climate collapse. SWISP (Speculative Wanderings in Space and Place) is an interdisciplinary speculative a/r/tography lab working in and across pluricreativities, digital childhoods, digital methods, digital education, and digital scholarships in the humanities, arts and social sciences. We entangle our research pathways in this collective to pose questions, break, disrupt and wander with/in multigenerational connected communities.

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Kathryn's research into practice includes creative practices, practices of identity, knowledge as practice and digital practices. She is an associate professor in teacher education in the Faculty of Education. With a focus on transformation, creativity, and particularly the ways in which we understand our relationships in art and design education, she works in a range of places promoting the uptake of digital pedagogies and creative practices for equity and justice. She has edited many books in creative education and educational futures including the most recent, *The Educational Turn: Rethinking the Scholarship of Teaching and Learning in Higher Education* (2023). Kate is committed to teaching through truth, equity and care; and, passionate about creating opportunities for young people to know, be known and be ready for the futures that they desire.

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Sarah's research is located at the intersection of big and little data, making and writing, virtual and physical, feeling and thinking, theory and practice. Best known for her contributions to the fields of critical affect studies, digital methods and the posthumanities, Sarah's interdisciplinary program of research is orientated by the idea of 'justice' (in all its forms) and involves research collaborations with academics, artists, practitioners, educators and the GLAM sector around the world. Sarah is committed to research-informed-teaching and teaching-informed-research that explores ideas through living inquiry and creative practice. She sees initial teacher education as a critical point of in(ter)vention for making systemic change and recasting educational futures so learning better caters to the needs of young people and pre-service teachers alike.

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ABSTRACT:

"I think I realised I lived in climate crisis when I was in year nine at high school and we were asked to fill out an online survey about our footprint on the Earth. At the end of the quiz, it produced how many planet earths we needed to sustain our individual lifestyles. I think my result was maybe 1.2 Earths or maybe 1.5. The quiz was implemented to introduce us to a sustainability project where we would investigate environmental and sustainable energy making techniques. I did my research on wind turbines. The year was 2009 and I lived in Brisbane" (Tipping Point Climate story #1 from 'Hacking the Anthropocene' workshop, Melbourne, 2024).

As this SWISP Lab 'tipping point' climate story suggests, we learn about the interconnected complexities and pluriversality of living in Anthropogenic times through a range of personal experiences. Some, like this 'Footprint on the Earth' story, are educational. Others are familial stories of times gone by told by grandparents to contextualise change in a community over time. Others are political, geographic, cultural or told through the lens of forced migration and displacement after homes have been ravaged by flood, fire or drought. Collected and curated by SWISP Lab, these everyday tipping point stories ground this chapter's contribution to critical discourse in teacher education, which is a much-needed discussion of the unique challenges and opportunities that educators face today as they navigate the realities of educating for Anthropogenic times when we all have a tipping point.

KEYWORDS:

Anthropocene, climate crisis, teacher education, educational realities, sustainability, tipping point pedagogical approaches, justice-oriented teaching, creative climate pedagogy, metho-pedagogy.

Navigating Educational Realities in Times of Crisis

Teacher educators are teaching teachers in times of concurrent crises. Young people have seen 2024 begin with wars burning in Gaza, Sudan and Ukraine and global peace-making in crisis. We have a national teacher shortage, cost of living crises and rapidly declining youth mental health. With increasing CO2 levels, drought, floods, ocean heat, and sea level rise pushing parts of the Earth systems into abrupt or irreversible change - this is our norm. *So how might we navigate these educational realities in times of crisis?* We are at a critical point in planetary health (human and non-human) and without significant interventions, these Anthropogenic crises seem unstoppable. The recent Interconnected Disaster Risks Report (Eberle, et al, 2023), warns that the Earth is on course to cross 6 'risk' tipping points:

- “Accelerating extinctions
- Groundwater depletion
- Mountain glaciers melting
- Space debris
- Unbearable heat
- Uninsurable future”.

Speculative Wanderings in Space and Place (SWISP) Lab create the opportunity for young people and teachers to identify their tipping points because, “the next two years are so essential in saving our planet” (Stiell, 2024). We collect, and curate the tipping point stories recognised during hackathons facilitated as part of the Hacking the Anthropocene project (See SWISP Lab blogs for further information <https://blogs.unimelb.edu.au/swisp/2023/12/22/hacking-the-anthropocene-climate-stories-between-art-and-science-in-bengaluru/>). A hackathon is a facilitated imagined possibilities workshop that as E. G. Coleman (2013) refers is the place “where craft & craftiness converge” (p.93) and what Lodato and DiSalvo (2016) refer to as issue-orientated breaking points. Our hacks centre on complexity and critical issues that we co-locate with participants as a tipping point in the Anthropocene. A good hack seeks to unravel a big, hard to comprehend event or hyperobject and craft it into something new. Before a hack begins, we decide on the “*At what point ...?*” question. The Intergovernmental Panel on Climate Change (IPCC) defines tipping points as “critical thresholds in a system that, when exceeded, can lead to a significant change in the state of the system, often with an understanding that the change is irreversible” (UN IPCC, 2021). Tipping points are identified by asking, “*At what point did you think _____?*” The “*At what point ...?*” question is critical to the hackathon game mechanics. It works best when it locates critical thresholds in a system that, if exceeded, can lead to irreversible consequences.

“I was born and raised in a place called Aguascalientes which translates to Spring Waters. As its name suggests, it was a place full of manantial. I always love the word manantial. Located at the centre of Mexico, Aguascalientes became early on a strategic place for industrial production and distribution for big companies like Coca-Cola, Pepsi and Nissan who established themselves around the late 1990s. It was back in 2014 that I went back with my childhood friends to swim in the two bodies of water, where we used to go as children. They were all gone. Aguascalientes did not stand by its name anymore. The land is dry and multiple species gone. The farm I grew up on became dust” (Climate story #2 from ‘Hacking the Anthropocene’ workshop, Melbourne, 2024).

Each individual account of living in this time of climate collapse is a personal ‘tipping point’ story. The tipping point stories that open this chapter were written by young people now living in Melbourne. As the Aguascalientes tipping point story shows, their family can no longer make a living in Aguascalientes which, as is pointed out, no longer lives up to its watery name. SWISP Lab has accumulated over a hundred tipping point stories and creative responses from November 2022 – April 2024 as part of a large-scale educational research project in partnership with Science Gallery International Network (See <https://sciencegallery.org>). The tipping point stories include everyday familial, socio-cultural, geo-political and community experiences on and with Land. “Land with a capital L refers not just to physical land but also to the Indigenous concept of all the environmental, ethical, and spiritual relationships encompassed therein” (Burke, 2021). They show the complex connections between Land as teacher through geography, family, culture, livelihoods and personhood in the Anthropocene. The stories and artefacts tell of both the devastation and the banality of these “disasters ... occurring at an ever-faster rate and, despite progress being made in how we prepare and respond to them, we are continuously being caught out by new extremes and new emerging threats” (Eberle, et al, 2023).

Kate started teaching in 1994 and the first published report of the IPCC was published in 1990. So, this brings us to thinking, why have we not seen the ‘biggest story in the world’ (Thunberg, 2023) enter our classrooms? Where are the predictions of regional and global changes in climate in the curricula? The models in the IPCC 1990 and 1992 Assessments confirm that the sensitivity of global mean surface temperature to a doubling of CO₂ is likely to be between 1.5° to 4.5°C (1990; 1992). *Why has so little been done in teacher education to prepare teachers for educating in the Anthropocene? Why aren’t teachers learning about the interconnected risks and dangerous planetary situations we find ourselves in? Why are teachers graduating without capabilities to learn with Land and, as a result, learn with Land in relation to young people? Why have others called us to action in teacher education (Brenna, 2019), but so little been achieved?* SWISP Lab have data (of which the abstract and beginning story are small fragments) that show the interconnectedness of

young people's tipping point stories and the everyday realities of growing up during concurrent global crises. Young people have said that they want (and need) time to share, connect and communicate their hopes, fears, anxieties, grief, and need for courage but do not get many opportunities to do so (Durcan, 2022). Young people have been let down by those who were (and still are) in power and educators of all types have a responsibility to do what can be done to mitigate this intergenerational injustice.

This chapter contributes to critical discourse in teacher education by addressing the unique challenges and opportunities that educators face today as they navigate the realities of educating for Anthropogenic times. The Anthropocene, or age of the humans, is a contested scientific term (Ellis, 2024). Just this year the Anthropocene Committee representing the International Union of Geological Sciences denied the Science evidencing the Anthropocene to vote 12-10 against naming this geological epoch 'The Anthropocene' (Zhong, 2024). However, it is still a helpful concept for teacher educators who are preparing the next generations of teachers to teach the next generation of planetary inhabitants because it "renders visible new architectures of time and matter, both sedimenting existing genealogies of global-world-space and radically reorganizing an imagination of the scope and material duration of what the human is in and through time" (Yusoff, 2017, npn). What Professor Kathryn Yusoff is talking about is the pervasiveness of gendered and racialised settler-colonial logics that have contributed to the geo traumas underpinning the present social, technological and ecological climate. These settler-colonial logics are problematic for many reasons, including the way they justify the continued *extraction* of knowledge, labour, materials, and life itself for the benefit of very few. In other words, the extractivist practices of the past and present contribute to the current climate – in all senses – creating the new architectures of time and matter that Yusoff refers to. An implication for teacher education is the need to reckon with these Anthropogenic times and climates of crises, ensuring their programs prepare teachers to actively shape the pedagogies needed for known and unknown futures.

Teacher educators are responsible for inviting a new generation of teachers to become concerned with the racial, gendered, political, cultural, geographical and economic injustices of climate crises. We "have to take up the serious challenge of what can be done in our sphere of action" (Brennan, 2019, p.2). As Teacher educators, SWISP Lab work with teachers (both pre-service and in-service) in a range of places including coursework, graduate research and internship classes in the Faculty of Education as well as through invitations to hack as professional learning to prepare teachers to navigate the interconnected risks and complex realities of the Anthropocene. As Olüfémi O. Tãiwø (2023, p.410) suggests, it amounts to nothing less than "remaking the world". For SWISP Lab, this involves adopting an expanded understanding of knowledge systems and knowledge

generation whilst considering the pluricultural, pluricreative, interdisciplinary, more-than-human, and deeply situated ways of knowing. This is how Teacher educators can begin to respond to the calls to action from the IPCC (UN IPCC, 2021) that urges the use of scientific, local, and Indigenous knowledge for adaptation and mitigation to the ongoing climate crisis.

In the following, we explore how the Anthropocene transforms dialogue and ideas about the so-called 'natural' world, reconsidering the place of education in Anthropogenic times in conversation with SWISP Lab's Hacking the Anthropocene project. Hacking the Anthropocene is one of SWISP Lab's suite of initiatives that make up a larger program of participatory research that is transforming the relationship between educational research and practice by creating opportunities for young people (14-28) and educators to re-imagine what it means to learn and teach where art and science meet – with the Land and technology 'in relation'. Robin Wall Kimmerer (2013, p.13) writes that Land is, "everything: identity, the connection to our ancestors, the home of our nonhuman kinfolk, our pharmacy, our library, the source of all that sustains us. Our lands were where our responsibility to the world [is] enacted." SWISP Lab's research enables new ways of thinking through interdisciplinary praxis (the meeting ground of theories and practices) for Anthropogenic times. As Drs Fikile Nxumalo and Eve Tuck (2023, p.141) locate, "doing participatory research means thinking differently about who has expertise, whose expertise matters, whose questions matter, who makes theory, and whose meaning-making counts." SWISP Lab research is always embedded in the teaching, and the teaching is deeply embedded in our research. Nxumalo and Tuck discuss this nexus by saying that "doing participatory research as a scholar employed by a university means thinking about how I spend my time with people, and how I want to teach students to do their work in relation to the communities that are important to them" (Nxumalo and Tuck, 2023, p.141).

Hacking the Anthropocene is a multi-faceted, participatory project which establishes a creative climate action pedagogy through social engaged data creation and practice. It involves six interconnected parts over 18 months in different Science Gallery and university locations:

1. **"Train the mediator" sessions:** Co-design mobile hackathon kits with Science Gallery Network mediators and explore the HAK.io methods on site – this includes writing Tipping Point stories in Science Gallery Melbourne, Bengaluru, and Atlanta
2. **Public engagement hackathon co-design:** Young people (e.g., Science Gallery mediators or pre-service teachers) design site-specific climate currere that creates encounters with artful actions / activisms

3. **HAK.io kit design and redesign:** SWISP Lab's designer-in-residence redesigns HAK.io kits in response to feedback and contributions to project during the Science Gallery Mediator "train the trainer" and co-design sessions. Revised kits go into production
4. **Public engagement hackathons:** SWISP Lab co-facilitates public engagement hackathons with young people through social practice (e.g., Science Gallery mediators)
5. **HAK.io Research Exhibitions:** Multiple exhibits of pluricreative artefacts and Tipping Point stories. See, for example, SWISP Lab X Science Gallery Bengaluru HAK.io UNFCCC Exhibit at COP28, Dubai, 2023 (SWISP Lab, 2023)
6. **ITE Hacking the Anthropocene:** Pre-service Teachers explore the mobile hackathon kit and HAK.io methods in *studioFive* and on stolen Country where the University of Melbourne is sited. They then 'hack' the climate currere designed by Science Gallery Network mediators, creating a living curriculum suitable for their school placements and future classrooms.

At the risk of stating the obvious, the part of the project this chapter emphasises is part six because it involves pre-service teachers. In saying this you should note the parts of the project are not linear or sequential. Nor can they stand alone. Instead, they should be thought of as the elements of an ecological model of teaching-research-teaching that is designed to ensure the contributions young people make to Hacking the Anthropocene – including their pluricultural climate currere – are carefully placed into the hands of pre-service teachers in *studioFive*. *studioFive* is a multi-arts studio in the Faculty of Education, The University of Melbourne. It is a significant site because it is the home of SWISP Lab and the place where secondary visual arts and design pre-service teachers and graduate researchers form their pedagogical and curriculum knowledge. At the University of Melbourne, visual arts and design education is taught through an a/r/tographic curriculum which invites pre-service teachers into a deeply situated pedagogical practice that enables them to rethink curriculum as a lived inquiry (Healy, et al, 2020) This grafting of research and teaching results in a hybrid metho-pedagogy (Coleman, et al, 2020; MacDonald, et al, 2022) that creates the conditions for research and teaching to continually inform each other, long after teachers have left the university. It also makes it possible for SWISP Lab to offer teachers the opportunity to participate in creative research for social transformation and expand their research literacies. This is important for cultivating interest because, as Tserelj et al (2024, p.11) note, "One of the most effective ways to engage teachers in learning about climate change is to get them involved in authentic research. In this case, their role as scientists is emphasized and an increase in knowledge about this topic can give them the confidence and motivation to improve instruction".

Pre-service teachers are designing units of work for 'Hacking the Anthropocene' that were started with Science Gallery Melbourne 'Not Natural' Mediators earlier in the year. The learning designs focus on selected 'Not Natural' works from the current exhibition. The Mediator designs, which inform the pre-service teacher learning designs, were created for co-facilitating public youth engagement workshops with SWISP Lab during Science Week. The Melbourne 'Not Natural' designs were gifted to the pre-service teachers in the Master of Teaching (Visual Arts and Design) Secondary as part of their learning area 'making and responding' studio workshops. The task was to use the Hacking the Anthropocene Kit (HAK.io) to hack the gameplay left by the Science Gallery Melbourne "Not Natural" Mediator team and develop a term long unit of work for teaching secondary art and design in Anthropogenic times. The buzz in the studio was palpable as HAK.io cards (See <https://doi.org/10.26188/25511560.v1>) were played. The playing of a card (or cards) would provoke a redesign of the gameplay, further ideation and then prototyping of the units was enabled through further card plays. The learning designs were playtested, further refined, finalised and then pitched to the class. As we move around the room, each team of becoming-teachers explore how they used and combined selected HAK.io cards: walking, digital play, badge making and collage etc. Each team aligned their learning design with making and responding components of the Victorian Curriculum and Assessment Authority (VCAA) visual arts and visual communication design standards (2016). Land-technology-human relations were explored through big ideas such as 'who are we in the story of machines in nature?' and 'at what point did you notice the unnatural nature of the Anthropocene?' The learning design pitch of each team included walking excursions, conflicting worlds to be created in stop-motion and collaged (2d and 3D) animal-Ai-human hybrids (Scene from Initial Teacher education program, Semester 1., 2024).

An Anthropocene Event

We currently live and learn in a time known as the Holocene, which commenced 11,700 years ago following the last major ice age. However, many scientists refer to the current period as the Anthropocene Event (Ellis, 2011; 2024). The Anthropocene describes the recent phase in Earth's history during which human - Anthropos (*in Greek*) activities have significantly affected the planet's climate and ecosystems. Two decades earlier, the story goes that Dutch meteorologist, atmospheric chemist and Nobel Prize winner, Dr Paul Crutzen declared, "We're no longer in the Holocene but in the Anthropocene!" (Paul Crutzen in 2000 at the International Geosphere-Biosphere Programme (IGBP) meeting in Mexico) (Davison, 2019). The following year, the IGBP hosted a pivotal meeting of more than 1400 members of the scientific, policy, resource management and media communities in Amsterdam. Amit Garg, Indian Institute of Management, India noted "It is my hope that this conference has stimulated and enabled broader information exchange between the developed and

less developed countries as well as between disciplines and scientific approaches” (Garg, 2001, p.3). Focusing on the need to study Earth as a system, the meeting produced the ‘Amsterdam Declaration on Global Change’ (Moore, et al, 2001) which included the following statements:

“The Earth system behaves as a single, self-regulating system comprised of physical, chemical, biological and human components.

and

Anthropogenic changes to Earth’s land surface, oceans, coasts and atmosphere and to biological diversity, the water cycle and biogeochemical cycles are clearly identifiable beyond natural variability. They are equal to some of the great forces of nature in their extent and impact. Many are accelerating. Global change is real and is happening now” (Ellis, 2018, p.32).

Scientists do use the word ‘anthropogenic’ when referring to environmental change caused or influenced by humans, either directly or indirectly. SWISP Lab’s work with young people and pre-service teachers is concerned with pedagogical approaches for critical ecological consciousness and strategies for nurturing ecological awareness among educators and learners. This includes place-based, and justice (technological, social and climate) orientated teaching in visual arts and design education for these Anthropogenic times. To do this, we propose speculative thinking as a critical element of collective re-imagining for complex environmental and social issues in education. Our mode of speculative thinking invites young people and educators to envision and challenge normative assumptions, fostering computational, critical and creative inquiry. Merging speculative methodologies and pedagogies our work with teachers is based upon practicing within an onto-epistemic metho-pedagogy (Coleman, et al, 2023) to create the conditions to address the multifaceted challenges of un/learning for Anthropogenic times.

The Anthropocene event(s) marks a significant moment in our understanding of human impact on the Earth for education. While argued and contested by scientists for decades, the Anthropocene is not a singularity nor a formal designation for our current epoch (Ghosh, 2024), rather, it is a series of pivotal points for the planet and in turn education to locate the impact of humans as an event (Gibbard, et al, 2022). Educating for Anthropogenic times, like others have suggested (Renouard, et al. 2023), necessitates theoretical and pedagogical change for education that acknowledges that we live in a more-than-human-world (Elton, 2022).

“Only beyond the mid-20th century is there clear evidence for fundamental shifts in the state and functioning of the Earth System that are beyond the range of variability of the Holocene and driven by human activities. Thus, of all the candidates for a start date for the

Anthropocene, the beginning of the Great Acceleration is by far the most convincing from an Earth System science perspective” (Steffen, et al, 2015).

At what point?

“I didn’t realise the true nature of the climate crisis until the floods in Pakistan a couple of years ago. I don’t remember where I was exactly, but I remember seeing pictures upon pictures of the so-called global South being destroyed by the impact of imperialist America. We’re so often at peace with the climate crisis in the west because we’re not at the forefront of climate and justice when the East has been looking after the environment long before the west termed it a crisis. Climate crisis is what colonialism told us was okay - that it is okay to extract from nature and that is what we need to undo” (Tipping Point climate story #3 from ‘Hacking the Anthropocene’ Mediator workshops, Melbourne, 2024).

The effects and affects of the Great Acceleration (Head, et al, 2022) and Great Derangement (Ghosh, 2016) are the throughlines of Tipping Point storying. Tipping Point stories are the way every Hacking the Anthropocene session or hackathon begins and what makes the hack personal – it is here that you recognise the self in the crises. A Tipping Point story is about the *point* that participants realise that they live amidst climate change/crises/catastrophe. They are personal, place-based, data stories that unlock the unthinkable and unimaginable. They open a door to collective imaginaries, interdisciplinary praxis, pedagogical possibilities and speculative thinking across scientific, digital and arts educations. The many stories (over 100, see SWISP Lab, 2023) highlight the complexities of living and learning in the Anthropocene while connecting local concerns with global geopolitics. As teacher educators, we create the conditions for new ways of knowing, being and doing in our hackathons. We bring these back into education through coursework and research subjects as currere (Irwin, 2006). The arts-based and digital/virtual responses in the hacks include stories and artworks that indicate lived experience of tipping points, i.e., extreme heat days, super storms, flooding events, sea level rise, melting ice, drought and forced migration (see SWISP Lab, 2023). The SWISP Lab hack data shows us firsthand how young people are making sense of living in and through climate change, biodiversity loss, pollution, and alteration of natural cycles as well as other world stories of migration. What we hear in the stories we have shared, are the impact of having an opportunity to trouble the multiple experiences we have in the Anthropocene. What our participants continue to tell us, is that they are offered little time in their formal education to inquire into Anthropogenic complexities or share climate stories.

The interconnectedness of environmental, social, and economic crises and their influence on teaching.

We propose an educational shift in teacher education in response to the Anthropocene event(s). The conventional human-centered and social constructivist approaches to teacher education which reify extractivist logics, colonialisms and instrumentalist practices are insufficient in times of concurrent crises. Our research is in agreement with scholarship that makes the case for pedagogical and theoretical transformation to begin decolonising “nascent teacher identities” and move “towards a new ethical relational stance” (Korteweg and Fiddler, 2019) to engage with a more-than-human world (Common Worlds Research Collective, 2020). Challenging Western-centric teaching practices that perpetuate imbalances *with* the land require new pedagogical approaches and currere that enable teachers and in turn the learners they will work with to enter spaces and conversations driven by calls to ethically, responsibly, and respectfully respond to the traumas of colonialism that story #2 seeks to undo. We propose a more just, diverse, and ecologically aware orientation that positions climate justice, First Nation’s justice and technological justice in teacher education. SWISP Lab research emphasises the importance of involving young people actively in their education, fostering engagement that is practical, reflective, and transformative to navigate and address the complex, intertwined crises of the world by broadening the scope of traditional learning. As importantly stated by Michi Saagiig Nishnaabeg scholar and artist, Leanne Betasamosake Simpson, “the context is the curriculum, and land, Aki, is the context” (2014, p.155).

Pedagogical Approaches for Critical Ecological Consciousness

“Climate change is the fight of our lives – and young people have been on the frontlines

leading the charge for climate justice,” António Guterres, Secretary-General.

Creative metho-pedagogical (MacDonald et al, 2022; Play Tank et al, Coleman et al, 2020) strategies that develop ecological awareness and sensitivity to the planet through learning with the 'land as currere' have shifted the ways we talk about schooling. William Pinar (2019) tells us that the running of the course— currere— occurs through in contiguity and in relation, where ongoing encounters among *and* between learners and teachers (human and more than, including Land) but also within oneself in solitude. ‘Hacking the Anthropocene’ acknowledges that the running of the course occurs socially, culturally, politically, geographically and personally through shared in partnership and solitary practice (sometimes silent, sometimes radical and performed) in relation *to* the land. 'Land as currere' encourages us to move away from knowledges that continue to replicate sameness and binaries that bound knowing, being and doing as we enter the space between - the space of multitudes, i.e., “the space between representational discourse and nonrepresentational discourse,”

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as Ted Aoki explained (2000, p. 325). 'Land as currere' allows us to ask what voices, traditions, bodies, and stories are living in our ways of knowing, being, doing and relating and learn with the Land.

A/r/tography is a metho-pedagogy that “transforms the traditional relationship between theory and practice by recognizing the movement found within a rhizome” (Irwin, 2013, p. 199) of practice and theory. Preservice visual arts and design teachers through this metho-pedagogy design their own learning with the Land as currere in their coursework learning area subjects in the Faculty of Education. As they develop their curriculum, pedagogical, and disciplinary knowledges as artists, researchers, and teachers they encounter artefacts (for instance zines, badges, collages, emoji stories) from SWISP lab research to inform their views of climate justice, activism, policy and practice. Currere shifts the emphasis of the curriculum concept from an educational object driven by policy to experiencing learning and teaching (Sellers, 2008, p.53) through looking at the self autobiographically. “A/r/tography is a methodology of embodiment, of continuous engagement with the world, one that interrogates yet celebrates meaning” (Irwin & Springgay, 2008, p.xxix). It involves understanding reality as a process of iterative becoming where “all bodies, including but not limited to human bodies come to matter through the world's iterative intra-activity, its performativity” (Karen Barad in Dolphijn & van der Tuin, 2012, p. 69). By emphasising the relations and meanings that emerge through knowledge sharing, it is a living inquiry that attunes to the spaces in-between research, art, and education – through making, walking, theorising and speculative play *with* scholarship. “A/r/tography radically transforms the idea of theory as an abstract system distinct and separate from practice, towards an understanding of theory as a critical exchange that is reflective, responsive and relational” (Springgay, 2008, p. 160).

SWISP Lab’s creative climate change pedagogies developed through a/r/tographic inquiry enable walking with the Land while mapping the embodied, site-specific inquiry of the Anthropocene (Shotwell, 2011). In Bengaluru, this involved the Science Gallery ‘Carbon’ Mediators forming a walking protocol for recording data in a 20-minute walk (sounds, sights, smells, feelings, daydreams, prayers, intrusive thoughts, and...whatever else may be co-located in the research site) at the National Centre for Biological Sciences in Bangalore, Karnataka.

The HAK.io Method 4 Walking card reads:

Let's hack the Anthropocene: This learning with the Land method challenges ways of knowing, being, doing through walking on Country. Country is understood through Indigenous worldviews that acknowledge "all living things to be related, destabilizing imperial hierarchies of man versus

nature in ways that demand holistic respect for nature or Country" (Black, 2011; Harrison et al., 2017 as cited in Phillips et al., 2022, p. 176).

Do you know the stories of this Country and land? Do you know the ancestors and traditional elders of this place that you walk upon? What have they created and left? Who are your ancestors from seven generations ago? What Country and lands did they walk upon? What decisions will you make to benefit the young people in seven generations to come?

Begin with connecting to place by tuning into the liveliness of the land and ALL of its inhabitants. By doing this, we might begin to sense the intertwined and intimate relationships we have with each other, the critters, the Earth.

Create a walking protocol. This could include drawing, photographing or recording soundbites as you walk to create an archive of your walking. An example of a walking protocol is walking for 20mins and stopping every 10 steps to look up and take a photograph of the sky.

Ask, what if.....?

This place-based education and creative metho-pedagogy card does what Sutoris (2022) refers to as “grasp, care, imagine, and communicate” (p.206). In Melbourne with teachers our walks are located on campus, and we walk with and from the Manna Gum tree on campus. Billibellary's Walk (See <https://murrupbarak.unimelb.edu.au/home/about/billibellarlys-walk>) guides our walking with the Land on campus and *with* Country. The walk is guided by an Aboriginal narrative to help us imagine, explore and care for the university landscape across time, space and place. The walk brochure states: “lying within the University of Melbourne’s built environment are the whispers and songs of the Wurundjeri people. As one of the clans of the Kulin Nation, the Wurundjeri people of the Woiwurrung language group walked the grounds upon which the University now stands since time immemorial”. When we walk with this Land-scape we are walking with one another, the land, sky and deep time. The walking method asks that they attune to the Land as a way of hacking the Anthropocene. We walk to consider if we can we for instance come face-to-face with the Anthropocene by listening with our whole bodies and impact of humans on the planet by walking in a duet with the Land on Country. A recent walk with pre-service teachers in the Master of Teaching began on the faculty ground floor where the Darebin Creek photo and artist statement of Wurundjeri Country by artist James Henry is located. Kate reads the wall text:

“My mind often turns to the Wurundjeri people who before colonisation would have walked where we stand, on this land now paved with tar and cement. They would have had more of an appreciation of the natural environment, which in turn would have informed their cultural value sets to preserve its beauty and its life sustaining properties. These photographs are a window into the past as a Creek once existed here, while also reminding us of the beauty of nature that exists in not too far away locations. I hope these images encourage students and staff to explore Wurundjeri Country, experience it in its natural state and appreciate the respect it needs and deserves”

Darebin Creek Wurundjeri Country photographer: James Henry.

We walked from the faculty up the street on the south of campus toward the university dental hospital through university square, under branches, through bark patches off the path in long grass, across the tram tracks and eventually into the Science Gallery Melbourne ‘Not Natural’ exhibition. Walking in the gallery we explored the works that invited us to consider Land-technology-human relations and then ended the walk on campus with a zine making reflection, that began with the prompt; *how do we learn with the Land?* While sitting in The University of Melbourne System Garden that locates the pre-colonial landscape and now built over Bouverie Creek, we listened. Attuned to the Land and in relation to the city beyond us and drew the feltness of the walk. As Aurora Milroy (2022) shared with us for the Emu Sky Science Gallery exhibition, “The university stands on the lands of the Kulin nation and before the uni was built, the Bouverie Creek was an important migration channel for eels. But even though the creek had been drained and covered over, the eels still pass through, underground, and (mostly) out of sight, a reminder that Country survives, and continues to tell its story.”

Locating Land as currere in teacher education creates opportunities for critical ecological consciousness or what Fikile Nxumalo and Pablo Montes (2023) also refer to as creative climate change pedagogies. As Lunney and colleagues (2013, p.132) urged: “Australians need to develop an ecological conscience: a strong awareness of the critical position of Australia’s fauna, and of our responsibility to conserve and protect it. Above all else, Australians need to develop a sense of empathy with other species and be prepared to share the continent’s resources with them”. Preparing teachers for educating in the Anthropocene through learning with the Land hacks the concept that teachers must only excel in literacy and numeracy as required by the Literacy and Numeracy Test for Initial Teacher Education. In 2022 the National Teacher Workforce Action Plan (the Action Plan) located five priority areas, including strengthening ITE. But nowhere in The Action Plan is there a possibility for learning *with* the Land, rather a strategy to attract more people to the profession and retain more teachers in the workforce rather than preparing them for teaching in the

Anthropocene and in turn young people for what lies ahead. SWISP Lab hacks teacher education and centres Land as currere for ecological consciousness. “Understanding the pragmatics of hacking is necessary to grasp the contradictions/tensions that mark hacking along with what I (E. Gabriella Coleman) call the poetics of hacking: the extreme value hackers place on ingenuity, craftiness, and cleverness” (Coleman, 2013, p.95).

Justice-Oriented Teaching in the Anthropocene

Teacher education in the Anthropocene is at the critical juncture of environmental justice and education futures (Moravec, 2019). As Farrell and colleagues (2022) in ‘Education in the Face of the Environmental Crisis’ suggest “teaching in the Anthropocene calls for a reorientation of the aims of teaching so that we might imagine multiple futures in which children, youths, and families can thrive amid a myriad of challenges related to the earth’s decreasing habitability”. What does a justice-oriented teacher education enable? Setting up pre-service teachers with the metho-pedagogical knowledge for making positive agentic change through “being in the world” (Biesta, 2022) is one step. Brennan (2019) agrees that “unless the next generations of students are themselves agents, alongside their teachers, community members and other experts, then teachers and teacher education will not be able to contribute to acting on ‘the Anthropocene’ (p.7). Despite the need for sustainable, radical, and world centred education that teaches how to be creative, critical, playful, speculative, and interdisciplinary there are few universities in Australia that have retained their art and design teacher education programs to develop these graduate teachers in and through practice. In the Master of Teaching, visual arts and design learning area subjects through discussing real-world problems and multiple perspectives, creating classroom community, and ePortfolio authentic assessment pre-service teachers lean into this urgency for a turn in education to be caring, and kind yet radical to the worlds’ need for change. During the pandemic, this became even more important. “Social justice is a necessary goal for which we need to be preparing our pre-service teachers to strive. This means helping our pre-service teachers to develop the tools necessary for such work, including the skills to recognize injustice” (Dodman, et al, 2014, p.85). For SWISP Lab, teaching, research, and service work are in symbiosis; where each enhances the other and advances the development of new knowledge through this ecological approach to pedagogy that is speculative and collaborative inter/transdisciplinary research, known as a/r/tography. A/r/tographic research (Burke and Coleman, 2024) develops participants languages and literacies to be agents of change by creating the conditions for developing life-wide preparedness through art as research; intellectual and creative development, personal and professional identity formation with theory as art; and socialisation in interdisciplinary communications found between art, research, and teaching.

To advocate for justice, SWISP Lab's philosophy of learner agency and world-centred design, not just in visual arts and design education, but in the core skills of praxis through visual literacy, climate literacy, critical and creative thinking, and digital innovation address environmental inequalities and empower educators to advocate *for* justice. Through pluridisciplinary initiatives, SWISP Lab's work with young people create the conditions for young people to play an active role in addressing the pressing challenges of our Anthropogenic age, acknowledging that collective anti-colonial action, interdisciplinary thinking, tiny creative actions and collaborative knowledge generation are crucial for shared pluriversal (Escobar, 2017) possibilities on a liveable and more socially just planet. When we speak about metho-pedagogies that foster **acting responsibly** we are invoking a speculative turn for the imaginaries of education futures. While pedagogies of response-ability (Braidotti, 2019) and mattering receive increasing attention in education, so too do concerns that not enough is being done to interrupt denials that underscore the Anthropocene (Ribó, 2023). The Anthropocene might be a political controversy, it raises climate anxiety, and there is complex science involved. While art education holds neither the problem or answers for future casting and response-ability for living the Anthropogenic times, we know it offers a playground of possibility to question and radically reimagine learning futures. While also teaching young people to not just be in the world but learn to read the world (Friere & Slover, 1983).

The Anthropocene can and should be integrated and embedded into all subjects in teacher education and in turn school-based learning, emphasising the importance of an interdisciplinary approach. "The Anthropocene in this sense is a blanket term to cover the intertwined crises of species and ecosystems..." (Brennan, 2019, p.2). Teaching the Anthropocene encourages creative and speculative thinking about being in the world, politics, society, culture, colonisation, language, economy, human-land-technology relations, justice, ecosystems, life on Earth, ethics, and sustainability. To do this we suggest introducing speculative pedagogical approaches (MacDonald, et al, 2022) that encourage all learners to envision and shape alternative futures for Anthropogenic living and learning as part of their education futures. It is possible to discuss the value of speculative thinking in challenging normative assumptions and fostering creative inquiry by posing im/possible questions such as:

- What are the knowledges, practices and relationships that can address the climate challenges of our rapidly changing world?
- How can researchers, practitioners and (young) activists contribute to an intergenerational ecosystem of learning around issues of climate justice and meaningful action?

- What do we, as a community, need to do to transform education, policy, and practice for our climate futures?

Embracing Transformative: Possibilities Navigating Educational Realities in Times of Crisis

We began the chapter by discussing the educational implications of the Anthropocene before introducing its relevance to teacher education at this critical juncture of converging environmental, political, cultural, social, and economic crises. We argued that the educational realities in times of multiple crises require teacher education to plan and design programs that are pedagogically responsive to shifts in local Land-technology-human relations through creative climate pedagogy. Doing so will provide the grounds to rethink the paradoxical and transformative potential of pedagogies for relational education that has the capacity to become more localised, emergent, anti-colonial, pluricultural and possibly pluricreative.

We located how we might re-evaluate teaching practices and pedagogical approaches for teaching, learning and assessment by examining the intersections of ecological consciousness, justice-oriented teaching, art and design education, and speculative thinking with climate pedagogies for the Anthropocene. What we know is that teacher educators play an important role in preparing learners of all ages and across disciplines and sectors to understand and address the challenges of the Anthropocene. We need to think creatively about incorporating the Anthropocene into our curricula and to advocate for comprehensive interdisciplinary relational climate education and creative climate pedagogies as activism. The Anthropocene event is a literacy that we must all be fluent in.

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