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Towards a Politics of Transgression in Environmental Education Research: Meta-review of a T-Learning Research ‘Archive’

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Abstract

The need for more radical forms of learning-centred transformation is increasingly recognised in transformations to sustainability. Yet these approaches to learning remain under-developed and undertheorised especially from a politics and environmental education research perspective. This paper offers a review of an emerging politics of transgression in environmental education research, as developed through an extensive T-learning (transgressive learning in times of climate change) knowledge co-production research programme, spanning eight years, and continuing. The ongoing problem that the research programme seeks to address is *how to do* transgressive learning in/as environmental education research in times where the fall out of coloniality and fossil capital collide in an increasingly regressive political landscape which Akomolafe and Ladha (2017, pg. 820) describe as “the deadening ideology of late-stage capitalism and its corollaries of patriarchy, rationalism, white supremacy and anthropocentrism.” Through the paper, I seek to highlight a “low theory” (Wark, 2021) of transgressive politics in environmental education research, embodied in *practices of transgressive politics as movement in co-engaged T-learning research*, which I illuminate through a meta-reflective curational process from the ‘archive’ or T-learning knowledge commons collection.

Keywords: Low theory; politics of environmental education; transgressive learning; transformations to sustainability

Introduction to the T-learning research programme and the Transformative Knowledge Network (TKN)

The need for more radical learning-centred transformation is increasingly recognised in the sustainability sciences (e.g. Glasser, 2007; Wals, 2007; Lövbrand et al., 2015; Boström et al., 2018; Rodriguez Aboytes & Barth, 2020). In 2014, the Intergovernmental Panel on Climate Change (IPCC, 2014) proposed that there is a strong need for learning-centred approaches to climate change adaptation, and argued that not enough is known about such learning centred types of transformation, or how they come about. This statement catalysed our¹ interest in probing what

¹The programme team involved in writing this proposal were research leads of the different case studies across the nine countries: Heila Lotz-Sisitka (South Africa – programme PI, and author of this paper), David Kronlid (Sweden), Arjen Wals (Netherlands), Mutizwa Mukute (Zimbabwe), Duc Tuan Tran (Vietnam), Million Belay (Ethiopia), Sosten Chiotha (Malawi), Martha Chaves (Colombia), Simon Kuany (India). In this paper I refer to “we” and “our” when referring to the research programme team collaborations and the contributions in the archive. However, I write this paper as a meta-review/reflection on the programme, and in this role I refer to “I” in writing the paper.

transformative, transgressive learning might look like in times of climate change, leading to an International Science Council (ISC) funded programme between 2016 and 2020, which extended from there (without ISC funding) on this topic. An expanding number of cases of T-learning were catalysed in nine countries across four continents (see methodology section below) in the first ISC funded period, but have expanded beyond this since 2020. We purposefully used the construct of “T-learning,” to keep open the spaces for thinking between and across concepts of transformative, transgressive, transdisciplinary learning, hence I refer to T-learning across the paper, but emphasise transgression, as we found this to be the most under-developed of the T-learning concepts at the start of the research programme (cf. also Bengtsson, 2019).

The focus on learning in transformations to sustainability relates to a core issue that has been emphasised in the environmental movement since the early work of Rachel Carson’s (2009) *Silent Spring*; namely behavioural and social change and *how this occurs via learning*. At the time of writing our proposal for the ISC T-learning programme in 2015, we knew that transformative learning was, and had been in focus in environmental education research (e.g. Reid et al., 2008; Rickinson, 2007; Scott & Gough, 2003; Sterling, 2011; D’Amato & Krasny, 2011; McKenzie et al., 2009; Singleton, 2015; Thomas, 2009; amongst others), but we also recognised that it was an under-researched narrative in the wider sustainability science arena (Glasser, 2007; Wals, 2007; Pahl Wostl, 2009; Diduck et al., 2012), especially in more complex areas of sustainability such as where unpredictable, politically complex “wicked problems” arise at the nexus of food-water-energy-climate and social justice (Lotz-Sisitka, 2012; McGarry, 2014; Mukute & Lotz-Sisitka, 2012; Mukute, 2013, 2015; Sol & Wals, 2014; Pesanayi, 2015 amongst others). We reasoned at the time that more insight is needed on how such learning emerges or can be expanded to strengthen politics and agency for sustainability transformations at multi-levels, and thus also how this could more strongly centre a politics of transgression in environmental education research. This problem was articulated further in an opening paper on “*Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction*,” applied in this instance to higher education (Lotz-Sisitka et al., 2015). It offered a first level of review of four different traditions of environmental education research that were engaging politically and transgressively with sustainability concerns. In this paper we argued that there was need for researching learning processes that could engage more directly and transgressively with the status quo, and particularly those systemic dysfunctions such as coloniality and capitalist trajectories that hold unsustainability practices in place, which opened the ISC T-learning research programme and TKN that we were co-designing at the time. It catalysed further inquiries into the politics of environmental education framed from a “transgression” perspective in wider contexts i.e. not only Higher Education as shared further below.

Methodology: Cases, establishing a T-learning ‘archive’ and approaching this knowledge commons collection reflectively

Working with and across civil society, youth, academic, government and community partners across nine countries in diverse areas that are vulnerable to arising impacts at the climate-energy-food-water security and social justice nexus the ISC T-learning TKN aimed to 1) initiate, 2) frame and 3) investigate expansive, transgressive approaches to learning in selected sites in Africa, Asia, Latin America and Europe. The TKN aimed to develop theory, methodology and practice, especially transgressive learning theory and practice and generative, interventionist, learning-centred research methodologies.

The T-learning TKN purposefully embraced a principle of heterogeneity in its work with a diversity of case studies. Local learning actions, and networked learning actions formed the focus of two different types of case studies at multi-levels and scales in order to enhance capability for transformations to sustainability. We worked on cases of local level expansive learning (Ethiopia, Malawi, Sweden, Netherlands, Vietnam, South Africa), and cases of networked, multi-levelled

learning (South Africa, Zimbabwe, India, Colombia). The case sites were identified in consultation with participating communities and organisations, who worked *with* T-learning researchers to co-define matters of concern, 2) identify potentially catalytic focus areas or practices for further expansive learning within collaborating communities of co-researchers, 3) develop situated T-learning methodologies for learning-led change, and 4) undertake reflexive reviews of these processes of learning with emphasis on observing and commenting on power relations, contextually relevant debates around T-learning (e.g. pluralism, decolonial sensibilities, complexity etc.) and emerging sustainability outcomes emerging in practice (cf. Lotz-Sisitka et al., 2016 for an overview of the co-defined research process). Importantly, the emergent co-engaged methodological approaches adopted by the research teams allowed for deliberative action learning in a diversity of social-material relations, contexts of risk, political complexity and associated contradiction, where there is a need to “learn what is not yet there” (Engeström, 2016).

The specific sustainability activities that were in focus for T-learning co-engaged expansions included the following: 1) developing local food systems including alternative economies (The Netherlands); 2) expanding solidarity and networked relationships amongst organic food production associations, contributing to new organic food production practices (Zimbabwe); 3) dealing with water crisis issues in rural and urban contexts; youth mobilisation for transformative change; food surplus management and transformation of markets for local green economy development; citizen monitoring of water quality and biodiversity; and environmental and social justice activism in a range of contexts related to mine pollution, pollution of river systems, water scarcity issues, food sovereignty and sustainable food systems development (South Africa); 4) legalising and promoting the conservation of sacred natural sites (SNSs) and bio-cultural diversity, and sustainable food system development (Ethiopia); 5) resolving food insecurity associated with severe climatic drought events in Lake Chilwa basin (Malawi); 6) dealing with climate change impacts and agricultural system development for adaptation in the Mekong Delta (Vietnam); 7) urban development, water systems, pollution and educational quality (India); 8) decolonial biosphere and eco-village development (Colombia); and 9) eco-schools praxis development (Sweden). Appendix A contains a short description of the cases with references to associated published works that emerged from the cases (see also www.transgressivelearning.org). Sites have expanded to ocean governance and fisheries.

The TKN also included in-depth theoretical reflection on T-learning approaches and underlying theoretical orientations, particularly in the specific case contexts, showing usefully that there is more than one way of supporting T-learning from a theoretical point of view (see Appendix A, and discussion below). By the end of 2020 (four years), the TKN had produced a substantive ‘archive’² or collection of work, other than the published references in Appendix A. Overall, the programme catalysed work with over 3500 people in more than 10 countries, 15+ post-graduate studies, and a substantive collection of published works, songs, films, poems, curricula, demonstration sites, and other co-engaged relational artefacts, captured in the programme archive or knowledge commons collection.³ In-depth meta-reflective theoretical work across the TKN cases and knowledge commons

²I refer to ‘archive’ here as a knowledge commons collection, as the concept of ‘archive’ could have a somewhat static connotation. Thus I use ‘archive’ in scare quotes, to warn against a static reading as the works are dynamic as is shown in the dynamism of the knowledge commons collection and its expansion in a short period of time.

³In total, over the four year period, the programme produced an incredible diversity of outputs including: 3 international research schools for early career researchers and programme team members; 53 internationally peer reviewed journal articles, 6 nationally peer reviewed journal articles, 5 books, 44 book chapters, 66 international oral conference presentations, 34 national oral presentations, 14 poster presentations, 51 international keynote invitations that included aspects of T-learning and 10 national keynotes; 24 television, video and radio outputs, 2 mobile applications, 31 creative practice engagements, including 21 songs; 11 training programmes (online and off-line), 70 blogs, 54 other outputs, and programme activities were hosted on 11 websites. 7 PhDs and 6 Masters studies were also completed, with a range of other post-graduate studies aligning with T-learning research emerging (T-learning final report to the ISC (Lotz-Sisitka, 2020)). Much of this work was captured on the T-learning website archive completed in 2020 (www.transgressivelearning.org), but a more extensive archiving of the ongoing work is underway as part of the

collection was not easy to do at the time, due to the scope and dynamism of the emergent research in the short period of the ISC funded part of the TKN's research, although some reflexive work across cases, materials, processes and contexts did emerge by 2020, and some reflection concepts being worked with was emerging (e.g. O'Donoghue, 2014; Peters & Wals, 2016; Bengtsson, 2019; Macintyre et al., 2020; Temper et al., 2019; Vogel & O'Brien, 2019). Since 2020, further published work, and contributions to the knowledge commons have emerged expanding the scope of the first phase of the research programme.

This paper takes a meta-reflective look across the 'archive,' representing a "curatorial" example of working with this TKN knowledge commons collection, with emphasis mostly on published works.⁴ I use the term "curatorial" as discussed by Martinon (2013), who differentiates it from "curating" to refer to "thinking the activity of curating." He states that "curating" is a professional practice setting up an exhibition, while the "curatorial" does not refer to the staging of an event, but rather the "event of knowledge itself." Bal (2012) refers to the curatorial process as a process of "framing," that requires sensitivity to audience and purpose of the framing and selection of materials from an archive. The purpose is not to venerate the objects in the archive, but to make them visible and educationally relevant to the intended audience (Hooper-Greenhill, 2012). It is in this sense that I work from the T-learning 'archive' in relation to the focus of this paper, namely an interest in revealing a politics of transgression in environmental education research.

In doing this, I seek out a low theory approach to reading these works as philosophy from below, generated with "the displaced, the marginal, and the recalcitrant and — through them — the possibility of a new world" (Wark, 2021, pg. 144). Contrary to the often narrowing reductive approach to systematic reviewing, I instead converse expansively with the revealed commitments and contributions of studies that have been emerging from the T-learning TKN, offering not a reductive or "high theory" of transgressive politics in environmental education research, but rather insights into the low theory embodied in *practices of transgressive politics as movement* in environmental education research, as revealed in and through the studies in the 'archive.'

Curating the 'archive' for a transgressive politics of environmental education research

I begin by situating the curations from the 'archive' in a review that reveals *practices of transgressive politics as movement in environmental education research*. The three practices that I review are working with theory, research practice, and knowledges co-produced.

1. Working with theory as low theory politics in T-learning research

Our 2015 review of theoretical influences that were shaping emerging commitment to T-learning research identified that T-learning emerges with diverse ontological foundations and epistemic commitments in different contexts. In other words transformative, transgressive learning in transformations to sustainability settings is *a process characterised by plurality*. This indicates that attention needs to be given to the ontological situatedness of transformative learning, *as well as* epistemic and cultural diversity in T-learning processes. In short, a summative view of the early reviews pointed to four "streams of emerging transformative, transgressive learning research and practices in the sustainability sciences: 1) reflexive social learning and capabilities theory, 2) critical phenomenology, 3) socio-cultural and cultural historical activity theory, and 4) new social movement, postcolonial and decolonisation theory" (cf Lotz-Sisitka

Rhodes University, Environmental Learning Research Knowledge Commons programme, to be concluded in 2025. The paper draws mainly on the first phase archive, but also includes work produced since, and represents a "curatorial" example of working with this archive as indicated in the methodology section of the paper.

⁴As not all partners were academics, some of the works are presented on the t-learning website as reports from the participating NGOs or policy actor organisations, and referenced as such.

et al., 2015 for further elaboration), with these being emerging influences shaping a politics of transgression in environmental education research.

Subsequently, a theoretical review of the emergence of the concept of transgression in the social sciences literature pointed to its inherently political character. Tracing the concept of transgression is an enormous project that cannot be fully covered here, but wide engagement with this concept can be found in the fields of theology, arts, literature, politics, decolonial research and more. In this literature, the concept emerges as being imbued with political meaning(s) that also reflect substantive ambiguity. Tracing the etymology of “transgression” from earlier religious discourse to later political and creative arts discourses, Julius (2002, pg. 19), summarises transgression thus:

Four essential meanings emerge, then: the denying of doctrinal truths; rule-breaking, including the violating of principles, conventions, pieties or taboos; the giving of serious offence; and the exceeding, erasing, or disordering of physical or conceptual boundaries. (cited in Collett, 2019, pg. 3)

Offering further nuance, Collett (2019, pg. 3) explains that “a fundamental aspect of transgression [is] its transitive property” as a movement (most often) *against* something. She argues that Foucault’s (1977) work on transgression “assists in considering the social implications of such an act,” with Foucault explaining that the act of transgression and the boundary are dependent upon the other, “each requiring the other in a form of relative co-definition” (Collett, 2019, pg. 3), indicating the political dynamism and fluidity of the notion of transgression (cf. Jenks, 2003). Transgression, Julius (2002) argues, seeks to “make the familiar strange and the unquestioned problematic” (pg. 26, cited in Collett, 2019; cf. also McGarry’s, 2023 recent work on the “suitably strange” as inspiration in transgressive learning research), with capacity to reveal a societies communal limitations. Collett (2019, drawing on Booker, 2011) further argues that transgression works subtly, “by gradually chipping away at certain modes of thinking that contribute to the perpetuation of oppressive political structures.” She notes that Booker further indicates that while genuine transgression is possible, there is also need to examine transgressive works for “hidden complicities with the powers-that-be” (pg. 9–10). Related to earlier critical theories and eco-critical pedagogy development, is Booker’s description that identifies Marxism, feminism and deconstruction as transgressive critical movements. To this we added decoloniality, and some of the emerging new materialisms (see below).

Booker’s view on transgression embraces “the disruption of hierarchies, taxonomies, or limiting systems of all kinds,” and the categorical “systems of rationalisation that produce exclusions or oppressions of particular marginal groups” (Booker, 2011, pg. 12, cited in Collett, 2012, pg. 8). Showing the politics of transgression, Booker’s work also challenges methods of categorisation and classification traditionally used to structure the Other (e.g. class, race, gender, etc.) i.e. the “systems of rationalisation that produce exclusions or oppressions of particular marginal groups.” This links transgression to Kristeva’s (1982) conception of abjection, which raises the important point that the concept of transgression, when coupled with abjection, can act as “reminders of the aspects of life that dominant culture seeks to repress” (pg. 14, cited in Collett, 2012, pg. 8), such as women, black people, Indigenous knowledge, unsustainability, and social injustice amongst others. Other applications of the concept of transgressive, such as “transgressive solidarity” (De Bono & Mainwaring, 2020) and aesthetics of transgression (e.g. Dierkes-Thrun, 2011; Ibrahim, 2019; Jamison, 2001) with emphasis on “interruptive emergence” and advice to constantly be open to reworking own transgressions or “remixing its remix” (e.g. Gunkel, 2012) to avoid repression and appropriations were also useful to consider. T-learning researchers added ethics of cognitive justice, care, inclusion, regenerativity, reconciliation, forgiveness and empathy as transgressive decolonial acts (McGarry, 2014, 2015, Kulundu-Bolus et al., 2020; Kulundu-Bolus, 2023; Pesanayi, 2015, 2019; James, 2019, 2022; Burt, 2019; Van Borek, 2019, 2021; Chaves & Wals,

2018; Chaves et al., 2015; Francis & McGarry, 2023, amongst others), a form of “ontological politics” described by Chaves et al. (2016; cf also Escobar, 2020 on an ontological politics of struggle). All of these informed and influenced emerging meaning(s) of transformative, transgressive learning in the T-learning programme as it developed over time.

Particularly bringing critical and decolonial research commitments together and earlier research with critical theories shaping a politics of transgression in environmental education research is the decolonial African feminist critical scholarly work of bell hooks and her “Teaching to Transgress” pedagogical praxis (2014). Her work embraces a radical form of decolonial resistance *as a pedagogy of freedom*. Inspired by Paolo Freire (1975) and African feminism, hooks brings joy, reciprocity, and teaching and learning processes into focus that are not afraid of transgressing boundaries, or of calling a politics of transgression into focus in educational research and praxis. She, together with other decolonial scholars (e.g. Fanon (2004), Mignolo (2018), Gordon (2018), Lorde (2012), Dei (2009)) who transgress white boundaries of social and spatial exclusion bring to the surface a type of “living learning” that is grounded in both ontological and political transgressions in life, living and experience in the world, resonating with African feminist (Kulundu-Bolus, 2017, 2020; Francis & McGarry, 2023) and critical realist dialectical transgression interests (e.g. Burt, 2019; James, 2019, 2020; Burt et al., 2018; Schudel, 2015, 2017; Lotz-Sisitka, 2019, 2022; Olvitt, 2017) amongst some of the researchers in the T-learning TKN.

Related to this is an expansive learning cultural historical activity theoretical trajectory emerging from the cultural psychology and educational research work of Engeström (2015, 2016; Engeström & Sannino, 2010, 2021), that helped researchers to foreground and surface often hidden and/or oppressed cultural historical realities and epistemologies of marginalised African communities. This trajectory helped to reframe the role of the researcher in these settings in which they could comfortably take up the role of insider co-engaged formative interventionist researchers (Mukwambo et al., 2022) working *with* communities to resolve pressing challenges and contradictions. This surfaced ways in which expansive T-learning research grounded in an onto-epistemic revealing and reclaiming of hidden or oppressed cultural histories and resolution of arising contradictions provides a means for insider formative researchers and their communities to co-define pathways to emancipation from historical oppressions through environmental education research (cf. Jalasi, 2020; Mphepo, 2020; Mudokwani & Mukute, 2019; Mukute et al, 2018; Pesanayi, 2019). This has since lead to work that more explicitly links cognitive justice and decolonial theory with onto-epistemic political experience, cultural historical activity theory and critical realist dialectical research (Lotz-Sisitka, 2022; see also earlier work by Mukute & Lotz-Sisitka, 2012; Mukute, 2015), articulating an emancipatory form of cultural historical activity theory research that is decolonial in scope and outcome (Lotz-Sisitka et al., 2023a, 2023b; Mphepo, 2020; Mudokwani & Mukute, 2019).

Other scholars in the T-learning research programme explored non-dialectical forms of post-human immanence and/or speculative disruption as resources for transgressive politics in their research, following thinkers such as Foucault (1977), Deleuze and Guittari (2019), Barad (2007; cf King, 2016), and Derrida (2012), with Bengtsson’s (2019) review on diffracting orientations to T-learning revealing the possibilities of these perspectives for conceiving political transgressions in T-learning research, which have since become more visible in commitments to new materialisms in environmental education research (Clarke & Mcphie, 2023). New materialisms mostly draw on Barad’s (2007) work inspired by quantum physics which views the world as a whole rather than as composed of separate natural and social realms, and develops a theory of agential realism that connects epistemology, ontology and ethics on an immanent plane (King, 2016). As argued by Bengtsson (2019), “excess” (after Bataille, 1991) frames endless potentiality of transgressions in T-learning, while Derrida’s hauntology surfaces a deeply felt transgressive politics of absent and excluded memories (Derrida, 2012), a perspective which has since developed more strongly in some emerging T-learning studies (e.g. Francis & McGarry, 2023; Martin, 2023). Closely related to this immanent theoretical trajectory are inspirations from object-oriented-ontologies of Morton

(2016), post-humanism (e.g. Wolfstone, 2018; Wessels et al., 2020) and speculative realism (e.g. Rousell, 2023), which offer theoretical inspiration for conceptualising a politics of transgression in environmental education research that takes embedded relationality with the more-than-human into account through intra-actions and vitalism (cf. Bengtsson, 2019; McGarry et al., 2023; Van Borek, 2021; Wals, 2019; Weldemariam & Wals, 2020; Wessels et al., 2023), while African feminisms and queer theory bring queering, black and female bodies, and spiritual dynamics of learning into focus in emerging transgressive politics in environmental education research (cf. Kulundu-Bolus, 2020; 2023; Caniglia & Vogel, 2023; Chaves et al., 2016; McGarry et al., 2021). Expanding these commitments in the T-learning programme, Bayo Akomolafe's inspirational work brings to the fore the "errant, monstrous, ironical, nonlinear and indeterminate" (Akomolafe & Ladha, 2017, pg. 819) nature of a transgressive politics of emergence, squarely challenging colonial-modernity's notions of emergence and progress, a trajectory that has been taken further by T-learning researchers in ongoing studies (cf. Koenig et al., 2024; Kulundu-Bolus, 2023; McGarry, 2023).

This brief overview of theoretical commitments of studies in the growing T-learning research 'archive' or knowledge commons collection usefully show that there is more than one way of supporting T-learning from a theoretical point of view. This may be seen in the traditional academic sphere as being contradictory, *if* we were following a path of "high theory." However, in all cases one can describe the ways of working with theory as a form of "low theory," as articulated in the citation by Wark above. Researchers interests were not to use or develop "high theory"⁵ for environmental education to direct their cases or to analytically confine them, rather they sought inspiration from this divergent theoretical platform to inspire and make sense of the emerging politics of transgression, agency and change in their grounded, co-engaged T-learning research, although these trajectories have divergent and contradictory notions of emergence and agency when probed with more depth, a matter that requires more substantive research. As stated by Bengtsson in his theoretically diffractive review of the T-learning programme in 2019, working with the concept of transgressive, "politically involves transgression to aim to engage with the ontology of current hegemony and to move beyond that hegemony, for example, by bringing into view the possibility of parallel multiplicities of ontology excluded in the current ontological outlook sustained in the reality as defined by a status quo" (pg. 3430).

Research practice as politics of co-engaged, expansive and explicitly transgressive learning praxis

In Malawi, South Africa, Colombia, Ethiopia, Zimbabwe there was an explicit focus on local territorial and Indigenous knowledge in T-learning processes which raised a number of interesting perspectives for T-learning research including the politics of language, cultural histories, issues of oppression and marginalisation of knowledges. For example Mphepo (2020) worked with marginalised women in Malawi to challenge gender relations and their Indigenous knowledge exclusion in the local farming system in response to recurring drought and hunger, while Burt (2019, 2020) worked with environmental justice activists to surface resistance practices in response to acid-mine pollution of local rivers in mine-affected communities in South Africa. Belay Ali (2015) worked in Ethiopia with communities to surface their knowledge of SNSs as a response to land degradation, and Macintyre and Chaves (2016) surfaced silenced knowledges in building peace and eco villages in biospheres in Colombia (Chaves et al., 2016; Macintyre et al., 2020). This raised the focus in the programme on cognitive and hermeneutic justice (Fricker, 2007, 2017) and its intertwined ontologically grounded nature as a key concern for T-learning research and practice, which became a focus of four T-learning PhD studies (Burt, 2020; Mphepo, 2020; Macintyre, 2020; Pesanayi, 2019). These case studies advanced a politics of decoloniality in

⁵Meaning theory developed by professors / academics outside of engagement with everyday people.

T-learning research, with this becoming an intensive focus of three of the PhD studies (Kulundu-Bolus, 2020; Macintyre, 2019; Vallabh, 2015, 2022; Lotz-Sisitka et al., 2024).

In South Africa, Burt, James, Pereira-Kaplan and Kulundu-Bolus presented a panel on their work “Muddy waters: questions arising in T-learning praxis” in a local Popular Education Network (PEN). The PEN was a gathering of popular educators from South Africa, a collective of Ghanaian representatives of the struggle for the Songor Lagoon Ghana, and others from Zimbabwe, and Puerto Rico. These T-learning researchers centred their political research practice in movements that foreground those most marginalised in society (human and more-than-human) (Burt et al., 2020). This surfaced the importance of an ethics of care in T-learning research, foregrounding feminist principles of care, listening praxis, and cognitive and environmental justice (Burt et al., 2020; James, 2022), advancing T-learning research as a form of transdisciplinary scholar activism (Burt, 2019; Erwin et al., 2022; Francis & McGarry, 2023; Pereira & Erwin, 2023) or decolonial engaged research (Lotz-Sisitka et al., 2024).

In India the T-learning research team brought together local systems of learning in communities with digital approaches to learning, crowdsourcing and data science, and experiential participatory approaches, with a number of different types of organisations being part of the process. Here the role of the youth and students were central as they identified issues, proposed actions, shared their ideas of what the tool should look like, what they would want to learn, know. This informed the development of the technology by using it and testing its assumptions and suggesting ways to improve it (Kuany et al. 2018; Mohanty et al., 2019). Similar T-learning research involving the democratisation of digital tool use was catalysed by Durr in South Africa (2018; Shetye et al. 2022) who worked on developing a digital application for market transformation in support of small scale farmers who were locked out of the formal market. Other researchers also turned to using digital tools transgressively, e.g. Francis and McGarry (2023), Mphepo (2020), Pereira (2024); Pesanayi (2019) who launched WhatsApp networks as foundation for inclusive learning network communications in South Africa. Through this they were able to involve those most marginalised in ongoing T-learning practices associated with agro-ecology and small scale fishers participation in resolving food insecurity and exclusion challenges (cf. Shetye et al., 2022; Pereira & Erwin, 2022; Pereira, 2024).

All case study teams also spent a considerable amount of effort and time reflecting on, and consolidating the insights relating to their research practices around T-learning research from a process and methodology, theoretical, as well as practical outcome point of view. In all cases, there were examples of new research practices and processes and methodologies established and developed. For example in Vietnam, “scientific farmers” (being a coalition of farmers and scientists) established a new approach to T-learning that enabled farmers to respond to flooding of the Mekong (Phuong et al., 2019), while in Colombia the use of an online course using co-defined intentions, video’s and shared dialogical resources offered a new methodology for expanding T-learning beyond the immediate environment (Macintyre, 2019). In Ethiopia a diversity of counter-hegemonic participatory mapping and dialogical methodologies were used to map and surface Indigenous knowledge of SNS conservation, contributing to legalising these previously ignored sites, as vital sites for bio-cultural diversity and resilience (Belay, 2015; Belay & Kassaye, 2018). In Zimbabwe, cross site / boundary crossing and solidarity building methodologies for expansive learning and co-engaged solution building were developed amongst agro-ecological farming associations (Mukute et al., 2018; Mudokwani & Mukute, 2019); while in South Africa learning networks (Pesanayi, 2019), podcasts (Van Borek & James, 2019), empaththeatre (Erwin et al., 2022), citizen science LABs (Vallabh, 2022), mobile phone applications (Durr, 2018), film (Van Borek, 2021) and song (Kulundu-Bolus, 2023) provided tools for generating both dialectically and immanently inspired processes of T-learning. I emphasise both with an understanding that a critical realist inspired socio-material onto-epistemic dialectics and a socio-material onto-epistemic immanence of new materialisms have different ways of understanding and explaining emergence, and thus also agency for transformative change. A critical realist theory of emergence emphasises embodied socio-materiality and axiological motive

for onto-epistemic dialectical emergence (Bhaskar, 2008), and new materialism emphasises relations of entangled immanence as driver of emergence (Barad, 2010). Interestingly, embodied in *practices of transgressive politics as movement in environmental education research* the different theoretical orientations, worked with as “low theory” as noted above, did not have dissimilar outcomes in the T-learning processes, since both foreground onto-epistemic emergence, and learning “what is not yet there” in open socio-material relations. This might point to the need for more subtle engagement with questions of emergence⁶ in transgressive environmental education research, especially when considered in the context of a emergence *in and as a transgressive learning process*.

Methodologies were also co-developed, some took the form of change, T- or challenge labs (forms of living labs/studios) (Macintyre et al., 2020; Mukute et al., 2018; Pesanayi, 2019) meaning that people agreed to co-learn while trying out how to co-develop new activities together in a real life settings that included productive demonstration site development, surfacing silent knowledges, and exchanging knowledge, ethical stories and relations, eco-village and agro-ecology activity development etc. across sites. It also included mobilising creativity and re-imagining the present with arts-based approaches, using film, song (e.g. Van Borek, 2021; Kulundu-Bolus, 2023; James, 2019), social media tools such as WhatsApp, and participatory courses (combining online and off-line) learning modalities as mentioned above (e.g. Durr, 2018; Macintyre, 2019; Shetye et al., 2022). Importantly, the research practices and methodologies themselves were not reduced to “techniques” but were constituted as deeply embedded socio-material sustainability learning processes that emerged via reflexive and ongoing transgressive learning co-engagements over time. A feature of these practices and methodologies was their capability for network building and relationality, as well as critique, embracing the decolonial and human/more-than-human relations that lie at the heart of environmental education political transgressions. Through this, each T-learning group challenged structural and normalised features of the status quo in different ways, while also enabling emergence of “transgressive moves” to address various status quo set ups and systemic dysfunctions as shown in Appendix A.

We found that ethics clearance procedures in university settings were inadequately aligned with the tenets and orientation of co-engaged research in open systems, especially as they fail to account for people’s agency in co-defining the research, and thus also the ongoing, reflexive co-monitoring of ethics praxis, which in itself is an ethical issue. This required us to do substantive intellectual work to re-define the meaning of ethics praxis in and for T-learning research, leading to a reframing of ethics protocol criteria, which were later accepted by the university ethics committee to guide similar studies (see Appendix B). Many ethics practices are quite colonially constituted, and are based on a positivist logic that the social world can be objectively managed, pre-defined and controlled by researchers who then “go out” to communities to do research with their permission (often using alienating instruments such as gatekeeper letters), and thus lack adequate orientation for inter-subjectivity, and lack reflexive, open and co-engaged co-defining and monitoring procedures for ethics praxis in open-ended learning-centred research designs (cf. also Kara, 2018). This work to articulate ethics praxis for co-engaged and open-ended T-learning processes (see Appendix B) was since taken forward by T-learning researchers in other research programmes (cf. TESH Collective, 2023; One Ocean Hub, 2022; Lotz-Sisitka et al., 2023a, 2023b) and remains an ongoing subject of research in the extended TKN (cf. Pereira, 2024).

In all cases, researchers have recognised that *a transgressive politics of environmental education as movement*, requires deep levels of engagement and critique, recognition of diversity, ethics and empathy, and willingness to co-engage in ongoing processes of reflexivity and transgressive change (spiraling reflexivity). This involves deconstruction of the status quo, and a relational

⁶Here it is important to recognise emergent relations, but to avoid conflation of mind, body, brain and world, which could be seen as a tendency in immanent theorising (Bhaskar, 2008).

being-in-the-world being as foundation for transformations and emergence, with emphasis on the relational and political processes that enable the latter to emerge.

Knowledges co-produced

The first form of knowledges co-produced centred around knowledge of the specific sustainability concerns that were in focus for T-learning co-engaged expansions, and included the following: 1) developing local food systems including alternative economies (The Netherlands: Macintyre & Temmink, 2018; Macintyre et al., 2020); 2) expanding solidarity and networked relationships amongst organic food production associations, contributing to new organic food production practices (Zimbabwe: Mudokwani & Mukute, 2019; Mukute et al., 2018); 3) dealing with water crisis issues in rural and urban contexts (Pesanayi, 2019; Burt, 2019; James, 2019); youth mobilisation for transformative change (Kuludu-Bolus, 2020); food surplus management and transformation of markets for local pro-poor economies (Durr, 2018; Lotz-Sisitka, 2019); citizen monitoring of water quality and biodiversity (Vallabh, 2017, 2022); and environmental and social justice activism in a range of contexts related to mine pollution, pollution of river systems (Burt, 2019; 2020), water scarcity issues and water relations (Pesanayi, 2019; Van Borek, 2021; Van Borek & James, 2019), and food sovereignty and food systems development (Lotz-Sisitka et al., 2017; Lotz-Sisitka & Pesanayi, 2019; Pesanayi, 2019) in South Africa; 4) legalising and promoting the conservation of SNSs and bio-cultural diversity and food system development (Ethiopia: Belay Ali & Kassaye, 2018); 5) resolving food insecurity associated with severe climatic drought events in Lake Chilwa basin (Malawi: Mphepo, 2020); 6) dealing with climate change impacts and agricultural system development for adaptation in the Mekong Delta (Vietnam: Phuong et al., 2019); 7) urban development, water systems, pollution and educational quality (India: Kuany et al., 2018); 8) decolonial biosphere and eco-village development (Colombia: Chaves et al., 2016; Macintyre et al., 2019); and 9) eco-schools praxis development (Sweden: Hellquist & Westin, 2019). Since then, studies have expanded to include transgressive hydrofeminist praxis in ocean governance (Francis & McGarry, 2023; Martin, 2023; Pereira & Erwin, 2023; Pereira, 2024) with ongoing work in many of the areas identified above (e.g. Lotz-Sisitka et al. 2022; Mukwambo et al., 2022; Lotz-Sisitka et al., 2024).

These knowledge co-construction processes involved a diversity of knowledges coming together around shared matters of concern. In all cases, knowledges co-produced in T-learning processes explicitly included partners from different types of organisations (e.g. social movements; regional networked NGO organisations; academia, policy institute; farmers, youth groups etc.). This constituted a widening TKN that was strongly sensitive to diversity of context and plural knowledge(s), especially the social-material contexts of practice, knowledges and lives of communities and how these are affected by sustainability concerns (e.g. artists perspectives on water were not the same as perspectives offered by monitoring groups, but both were valuable; or a scientists knowledge of farming under drought (e.g. Malawi) or flooding (e.g. Vietnam) conditions was not the same as that of the farmers, but both were valuable). We found the combination of a shared and evolving research interest in T-learning, practiced with low theory orientation, combined with a wider range of disciplinary and contextual knowledges to be crucial for establishing and co-developing T-learning research knowledge. This produced a richer “ecologies of knowledge” (De Sousa Santos, 2015) on sustainability concerns relevant to T-learning in all local contexts.

A second important form of knowledge co-produced was knowledge of T-learning. The type of research undertaken (described above) in the TKN allowed for the emergence of grounded and co-engaged perspectives on T-learning, and raised unique perspectives on the possibilities for co-engaged T-learning, and the difficulties (e.g. how to develop a T-learning podcast where 11 official languages co-exist cf. Van Borek and James (2019); how to overcome inherited oppressive cognitive injustices cf. Burt (2019); Kulundu-Bolus, (2023) or social-material exclusions cf. Pesanayi (2019) or an absence of solidarity relations cf. Mudokwani and Mukute (2019)). In all

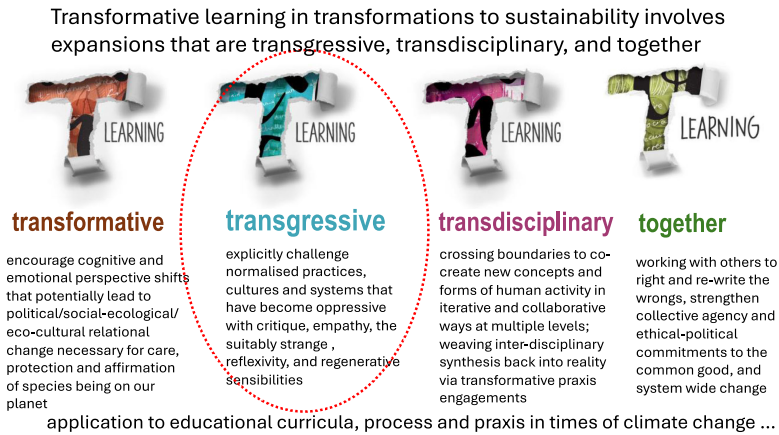


Figure 1. Synthesis framing of T-learning as elaborated through iterations of engagement with the T-learning ‘archive’ and ongoing definitional and praxis engagements, that may yet be incomplete⁷ (Source: Author).

cases, we were also able to reflect on, and articulate qualities of T-learning which allowed us to develop differentiated insights into T-learning, and we were able to develop tools for reviewing understandings of T-learning not only at niche level (via localised interactions), but also in multi-levelled perspective where activity systems at different levels are inter-connected (see Figure 1 below).

More refined understanding of the qualities and processes of T-learning in Times of Climate Change were produced. In terms of the processes of T-learning, these are broadly captured above in the section above on research practices, but we also learned that the *way in which practices and methodologies are constituted*, leads to *particular qualities of T-learning*, i.e. the process and politics of research and forms of T-learning and associated outcomes are politically intertwined (e.g. counter-hegemonic mapping T-learning praxis to identify and validate SNSs with communities in Ethiopia led to policy change). Thus, in general situated, co-engaged and critically constituted methodologies that confront colonial, exclusionary, unsustainable and master-slave type relations, and inadequate human-more-than-human relations produce qualities of T-learning that foreground cognitive and epistemic justice, environmental justice, solidarity (with the human and more-than-human), acknowledgement of silent and previously hidden or marginalised knowledges, empathy, emotion, relationality, anger and other qualities of learning that are often ignored in mainstream learning sciences that tend to focus on cognition only. The TKNs research therefore draws attention to this wider range of qualities of T-learning, which equally recognises the importance of new knowledge, but also the importance of how this relates to and emerges from or “moves with or against” other forms of knowledge such as tacit knowledge, spiritual knowledge(s), Indigenous knowledge, experiential knowledge and learning and more. It therefore offers a more complex politically constituted “ecologies of knowledge” (De Sousa Santos, 2015) configuration for qualities of learning than are recognised in the mainstream learning sciences, and in the contemporary sustainability sciences which tend to focus more instrumentally on first, second and third loop learning as main descriptor and analytical tool for learning (e.g. Pahl Wostl, 2009; Reynolds, 2014). Subsequently we have found researchers engaging with the scope of qualities of T-learning, adding to richness to the concept. For example, Ott (2023) has added insight into the importance of imagination framed from open process engagement with utopia’s; while Ojala (2016) argues for centring emotion in T-learning research. McGarry articulates engaging with the “suitably strange” (2022); intergenerational knowledge

⁷See for example: <https://transgressivelearning.org/2017/09/06/mean-t-learning-definitions-acts-defining/>

(Francis & McGarry, 2023) and ancestral knowledge (McGarry, 2023) as a qualities of T-learning. This indicates that surfacing qualities of T-learning remains an open process of elaboration, as yet incomplete.

Overall, with considerable iterative reflection on the ‘archive’ over a long period of time, I put forward the above definitional framing of T-learning (Figure 1) as tool for ongoing iterative reflexive engagement by the TKN and an expanding network of T-learning researchers. Here I recognise various iterations of this Figure worked with since 2018, with this helping us over time to consider the relationship of transgressive learning to revised framings of transformative learning, transdisciplinary learning and collective (together) learning. I, together with other researchers have been *applying this emerging framing to different contexts of practice* e.g. teacher education (Lotz-Sisitka et al., 2022; O’Donoghue et al., 2022; Manni & Knekta, 2020), Science, Technology, Engineering, Arts and Mathematics (STEAM) curriculum settings (O’Donoghue et al., 2024), Masters education curriculum re-design (Kulundu-Bolus, 2023) and Eco-Arts Education (Preston, 2022) amongst others. This too remains an open process of elaboration, as yet incomplete, but one that is vital for the politics of transgressive learning research to make its way into formal education settings, and thus wider processes of educational transformation.

Summative perspectives from the ‘archive’ or knowledge commons collection

As noted above in perspectives from the T-learning ‘archive,’ transformation of social and social-material life is both concept and activity dependent (Bhaskar, 2008). Therefore, social and the social-materiality of environmental change needs to focus on conceptual change, as well as activity change, hence also our commitment to slowly developing and clarifying the meaning(s) of T-learning to guide a politics of environmental education research as movement. In all of the cases, there is substantive evidence that T-learning as co-defined through our work, can contribute to change in human activity and social-material relations, and that collective learning approaches and research practices and methodologies outlined above can enable changes in human and more-than-human relations at interconnecting multiple levels. For example, in the Malawi case, changes in farming practice that built on women’s Indigenous knowledge allowed for a more inclusive and transgressive form of farming activity based on food sovereignty principles that better respected ecological principles (Mphepo, 2020). The Netherlands case showed strong contributions to local transition initiatives, with more than 120 markets and community dinners provided during their case study period with more people eating organically grown foods⁸ (Wals, 2019), while multi-levelled solidarity relations emerged amongst farmer associations in Zimbabwe (Mukute et al., 2018; Mudokwani & Mukute, 2019). There are more such examples of activity change in the ‘archive’ as captured briefly in Appendix A.

From a movement perspective, the TKN praxis led to extensive network building, and building of political alliances constituted in social and social-material relationships to address local sustainability concerns, and relationships amongst organisations interested in supporting T-learning processes to support transformed activity. While not reductively, it advanced both critical realist dialectical and intra-active forms of political relational agency as mechanisms for contributing to collective social-ecological changes. T-learning processes were shown to proactively contribute to changes in collective agency formation, showing that T-learning can lead change (Engeström, 2016) - but not in its modernist, colonial form (Lotz-Sisitka et al., 2023a, 2023b; 2024). Besides changes in the political and social-materiality of activity, the archive shows examples of transgressions of unsustainable political and environmental “norms” in the transformed activity and relations that were actualised (e.g. Belay Ali & Kassaye, 2018; Lotz-Sisitka et al., 2017; McGarry, 2023), and most importantly a change in politics away from modernist and colonial framings of emergence to more subtle, co-engaged and connected relational forms of

⁸<https://transgressivelearning.org/case-stories/netherlands/>

emergence and change, that also involve “Lying down with the trouble” as discussed most recently with T-learning researchers and others in Koenig et al., (2024).

The T-learning processes discussed above have made differences to the lives of those most marginalised. For example, marginalised women in Malawi were able to assert the value of their Indigenous knowledge for enhancing food sovereignty (Mphepo, 2020); black youth in South Africa were able to assert and articulate their desires for transgressive pedagogies of the present (Kulundu-Bolus, 2023). Severely marginalised women farmers were able to produce food and engage in food sovereignty activism (Pesanayi, 2019) while scientists and farmers were able to engage communities together for climate change response-ability in Vietnam (Phuong et al., 2019), and communities in Ethiopia were able to assert their rights to conserve and protect SNSs (Belay Ali & Kassaye, 2018). Inclusion of ancestral knowledge led to transformations in environmental law (McGarry, 2023) and eco-village development (Macintyre, 2019). This shows that political transgressions are not just a rhetorical politics in environmental education research. They partly answer the question asked by Williams et al. (2018) “when does transgression become development [meaning socio-material changes in activity]”?

The sum of this work is indicating that it is a diversity and plurality of onto-epistemic commitments that shape meaning(s) of what a politics of transgression in T-learning / environmental education research could be i.e. a pluriversal politics as articulated by Arturo Escobar (2020). This work joins a larger conversation on politics in contemporary times, addressing Fanon’s question, “who will change the (colonial) world?, and Escobar’s (2020) question on how to reweave the communal basis of life which calls us into coexistence with others and the more-than-human world. As Mamdani (2022, pg. 2) reminds through a reading of Fanon in a discussion on the contemporary relationship between politics and society: “Fanon did not respond with a classically Marxist answer: those structurally at the centre of the colonial political economy, such as the working class. Instead, Fanon turned to those structurally *excluded* (rather than *incorporated*) from both the political economy and the polity, such as the rural population without land, and the urban unemployed.” Those working in low theory ways with new materialist forms of post-human theory remind us that the more-than-human are also to be included in redefining the relationship between politics and society in our politically inspired educative movement actions (e.g. Martin, 2023; Wessels et al., 2024; Wolfstone, 2018 amongst others). Escobar emphasises that the “struggle to reinhabit the pluriverse is everyone’s” (2020, xvii). As shown through the conversation in this paper, low theory of transgressive politics for environmental education research arises where “other spaces of power, where new embodied forms of justice (in the form of different ethico-epistemo-political imaginaries [to those of colonial modernity]) might thrive” (Akomolafe & Ladha, 2017; Francis & McGarry, 2023).

Overall, the meta reflection and curating of the T-learning TKN ‘archive’ or knowledge commons collection outlined above, indicates that a politics of environmental education as movement, constituted through open process, co-engaged, reflexive and dynamically constituted transformative research is both urgently needed and desired. In particular, from a global South perspective, it seems that this is especially, but not exclusively so in those contexts where historical oppression, political instability, coloniality and massive ecological degradation and climate change risk present huge challenges for people and the more-than-human on the ground. Returning to Wark’s “low theory,” this paper and the ‘archive’ or collection of transgressive learning research curated here as a contribution to re-centering politics in environmental education research as transgressive movement perhaps reflects Prettyman’s (2018) argument that “low theory” based on a labour point of view, and “low theory” based on an ecological intra-active point of view both function as hopeful accounts of political-material knowledge practices in times of climate change, pointing towards more complexly realist theories of learning, agency, relationality, being and becoming.

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Author Biography

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Appendix A

BRIEF summary of country-based T-learning studies in the TKN (Note: only academic publications are listed here, there were many other forms of contribution).

Country	Focus of case study	Transgressive movement and outcomes	Main Associated Publications
<i>Vietnam</i>	T-learning in the Mekong Delta with farmers facing climate change impacts (flooding of fields/ sea level rise)	Studies targeting ecological farms conducted in the provinces of Ca Mau, Ben Tre, Dong Thap and An Giang, showing an expansion of the initial activity around T-learning. T-learning processes confirmed the importance of the convergence of instrumental learning, communicative learning and emancipatory learning for T-learning praxis. These were articulated into sustainable livelihood models, and evidence of contributions to agricultural transformation and climate change adaptation were recorded.	Phuong and Tuan (2018) Phuong et al. (2019)
<i>India</i>	T-learning co-engagement process in development of a youth-led crowdsourcing application for monitoring of SDG 4 in urban communities	Studies involving 17 consultations, 15 youth-led participatory workshops in 8 educational institutes reaching a total of 1764 students. Four stages of activity took place in Gujarat, Kutch district, specifically in Bhuj and Gandhiham talukas, involving co-defining a participatory advocacy toolkit for SDG monitoring; a beta version of the MEdAL application was shared and tested with youth participants, before finalisation and online release on google playstore.	Kuany et al. (2018) Mohanty et al. (2019)
<i>Sweden</i>	Clarifying the dynamics of T-learning in the Swedish Green Flag/Eco-Schools initiative	Engaged with teachers and other stakeholders to engage with and advance eco-schools praxis in Swedish eco-schools; clarifying transformative, transgressive dynamics of eco-schools praxis. Also contributed to overall synthesis across cases in the TKN; theorising t-learning across cases.	Hellquist and Westin (2019) Bengtsson (2019)
<i>Colombia</i>	T-learning network across six co-operating bio-regions in the CASA Colombia network	Eco-village practices developed through co-engaged learning in situ, and across the emerging online learning network, co-facilitation partnerships established amongst the team from the six co-operating bio-	Chaves et al. (2015; 2016) Chaves and Wals (2018) Macintyre and Chaves (2017) Macintyre (2019) Macintyre et al. (2019) Macintyre et al. (2018) Macintyre et al. (2020)

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Country	Focus of case study	Transgressive movement and outcomes	Main Associated Publications
		regions in the CASA Colombia network; semi-virtual course which was co-produced with grassroots communities in rural Colombia, called 'Koro 2018: In Search of our Tourism of Origin'	
The Netherlands	T-learning and sustainable food systems in "LekkerNassuh" in the city of The Hague	Significant development in the local food system towards sustainability and new forms of shared economic activity (de-linked from mainstream). Locally the Lekker Nassuh programme received the 'green ribbon' award for best local sustainability initiative in The Hague.	Macintyre and Temmink (2018) Wals (2019) Peters and Wals (2016) Macintyre et al. (2019) Weldemariam and Wals (2020) Wessels et al. (2024)
South Africa	Seven networked case studies that focus on T-learning theory and praxis ** some of these supported by DSI/NRF SARChI Chair but integrated into ISC T-learning programme.	1) Amanzi [Water] for Food programme T-learning in E.Cape led to the expansion of the T-learning network model to two other sites nationally and an expanded Training of Trainers participatory certificate course involving 100 participants, and food production outcomes for farmers. 2) the Food for Us programme mobile phone application developed and tested to support T-learning for on-farm surplus reduction and market transformation for smallholder farmers. 3) The Changing Practice Environmental Justice programme supported activists to engage critical issues in their contexts, and concluded with a graduation ceremony for community-based environmental justice activists, with activist work ongoing. 4) The Day One podcast T-learning process engaged youth in storying water experiences in the City of Cape Town (around the city's water crisis), and to build knowledge about complex urban water situations with podcasts developed and shared across the city; later extended to development of film project leading to reconciliation-led curriculum, and arts-based pedagogy development with children. 5) The Empatheatre research led to design and development of a new generation of Empatheatre work which led to activism in a Coastal Justice Network, as well	Lotz-Sisitka et al. (2017; 2022; 2023a, 2023b); Lotz-Sisitka (2019; 2022) Burt et al. (2018) Van Borek and James (2019) James (2019) Burt (2019; 2020) McGarry et al. (2019) Pesanayi (2019) Van Borek (2019; 2021) Vallabh (2017; 2022) Lotz-Sisitka and Pesanayi (2019) Kulundu-Bolus (2020; 2023) Durr (2018) Shetye et al. (2022) Schudel (2015; 2017) Olvitt (2017) Pereira and Erwin (2023) Pereira (forthcoming) O'Donoghue et al. (2022; 2024) Mukwambo et al. (2022) McGarry et al. (2019) McGarry (2015; 2022; 2023) Martin (2023) Erwin et al. (2023)

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Country	Focus of case study	Transgressive movement and outcomes	Main Associated Publications
		<p>as change in environmental law amongst other outcomes in the One Ocean Hub. 6) Activate! Change Drivers T-learning research led to production of 21 films of Change Drivers voices for change. 21 Songs were composed as a form of mirror data to mirror back the messages of change and desire for a 21st Century African Liberatory Pedagogy that is transgressive, which has since led to framing of regenerative pedagogy and curriculum design. 7) T-learning and Citizen Science contributed to reconfiguring the landscape of citizen science and scaling of citizen sciences for community-based water quality monitoring and employment of unemployed youth, as well as learning pathways for unemployed youth.</p>	
<i>Zimbabwe</i>	expansive T-learning and solidarity building with organic farmers	Ongoing Change Laboratories with farmer organisations, including demonstration based case study exchanges, with organic farmer representatives of the wetter Mashonaland East visiting and learning from seasoned farmers in the drier Shashe and Masvingo and Mazvihwa in Midlands Provinces of Zimbabwe. Extended engagement with and across organic farmer associations in Zimbabwe continued.	Mukute (2015) Mukute et al. (2018) Mudokwani and Mukute (2019)
<i>Ethiopia</i>	T-learning to support the conservation of Sacred Natural Sites (SNS) of the Meo Keble in Bale, Oromia Region	With MELCA, the Bale community in three Weredas (districts), Dinsho, Goba and Robe, managed to protect 21 natural sites. T-learning interactions that share knowledge of protection of SNS across these contexts led to an increase in protection of SNS. The community in Meo Keble have rehabilitated a local wetland, and brought back some of the indigenous species to the holy sites. Social cohesion increased, and government started visiting the SNS, and giving legal certificates, which encouraged others to follow suite.	Belay Ali (2015) Belay Ali and Kasseye (2018)

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Country	Focus of case study	Transgressive movement and outcomes	Main Associated Publications
Malawi	Food security and informal learning of rural women	Surfaced and tested local solutions suggested by women in the T-learning change laboratories to address contradictions that adversely affected local farming practices. Demonstration gardens for learning purposes at the local community level were established, with local community commitments and success levels being high, recognising women's Indigenous knowledge and leading to increased food security. Farmers started sharing seeds of local maize cultivars for upscaling, and youth also got involved in accessing local maize seed for multiplication and sharing amongst themselves (Mphepo). A related study into energy cook stoves helped to support rural women's climate change adaptation (Jalasi)	Mphepo (2020) Jalasi (2020)

Appendix B

Tool for developing an ethical code of practice for co-engaged, generative T-learning research

This tool was developed in the T-learning TKN to assist researchers develop an ethics protocol for deliberating the many dynamics of generative co-engaged research. Research team/s were encouraged to discuss and adapt or adopt (as relevant and emerging from their deliberations) the following processes in their research to develop a customised “CODE of PRACTICE” at the start of the research projects with partners to ensure:

Respect and dignity

- Take care to be as open and honest about the details of involvement as possible.
- Put emphasis on the voluntary aspect of involvement.
- Be sensitive to social diversity and complexity and various dimensions of social difference; including language and translation dynamics.
- All participants will be given a choice to remain anonymous, to participate voluntarily, and to withdraw from the process at any time. Participants will be asked to sign an informed consent form, but the form will be carefully explained in vernacular language to ensure that the content of the form, and the purpose of the research is clearly understood by participants.
- Interpretation and translation processes require trust as well as rigour and care will be taken to ensure good quality translation processes where these are used.
- In cases where personal narratives are to be used in analysis, participants will to be consulted and informed consent will be requested, and identities protected as agreed with participants.

Transparency and honesty

- Filming, voice recording, and other forms of documentation should be practised with the informed consent of the participants; which may also include informed consent to use extracts from these.
- Carefully explain and negotiate with participants how the researcher plans to use the material that is collected in interviews, workshops and other research activities.

Accountability and responsibility

- TESP research processes are likely to rely on voluntary participation over time amongst a group of multi-stakeholders. The purpose and agreed commitment to participate in the research and the potential value of the research must therefore be co-defined by the group who is willing to participate in the research. This co-defined purpose around shared matters of concern should serve as a “beacon” for ongoing reflections on the process as it unfolds over time.
- Continual reflection on the part of the researcher/s as “Responsible Participant” and with participants to encourage thoughtful action.
- Being devoted to “being present” (Scharmer, 2016).
- *Ethical praxis should be integral to the full process of the research.*
- The research should present both academic and practical value, and adequate attention should be given to beneficence and the value of the research for the participants which should be co-constructed with them / collaboratively negotiated. This can involve ethical obligation to carefully and critically consider what the research will achieve at different levels of say for example, local group, city, community, and country in which it is being done.

Integrity, academic professionalism and researcher positionality

- Research ethics involves both moral integrity and personal integrity. Researchers need to be explicit about their role in the research process and the knowledge and experience that they bring into the research relationship.
- Participants are encouraged to ensure that all co-participants in the research fully understand the research and what the meaning of “informed consent” is, and that they are free to withdraw at any time.
- Co-participating in the research involves a range of diverse processes as the research is not fully pre-determined. New processes that are introduced must be carefully negotiated (e.g. if there is need for an additional workshop, or the prospective agenda of workshops need to be pre-negotiated).
- When writing research, a more restricted range of processes are involved which tend to centre around the author of the written text, who then claims authorship in terms of a final “product.” This raises ethics questions around how one adequately includes co-participants in the representation of research. Researchers are encouraged to discuss the issue of representation with co-participants in the study sites and to invite co-authorship if participants are interested in contributing in this way to the co-engaged research process.

When making claims, there is need to give attention to:

- Do so with the trust and the permission of the participants, being mindful of the addition to the collective body of knowledge in the discipline.
- Continually reminded ourselves of the structured nature of all accounts and the ethical responsibility to do no harm, and to write in ways that promote social justice.

- **Resist easy categories:** Aim to avoid oversimplification, provide space for quieter voices, contextualise claims to illustrate the individual and group roles and identities within larger social realities.
- Conduct authentic member checks: Invite participants to respond to data and findings (written, film and audio versions of the work), and ensure that corrections to interpretations are rigorously and carefully made before final use of the data.
- Share the process: Demystify the research process by careful description of the existant and anticipated research process (this needs to be done regularly as the research process unfolds and changes).
- Be constantly reminded that no innocent position exists: Resist the urge to romanticise the participants' voices or the role of the researcher.
- Avoid “ontological collapse” (Lotz-Sisitka, 2012) by ensuring that accounts of actions and events are not translated into statements about states and properties without a clear enough context and process description.
- Generative research requires reflexive engagement with whose research questions are being engaged, how is this determined, and it also involves being alert to issues such as research “fatigue.”

Researcher positionality also needs attention in generative research, and there is need to be reflexive about the researchers position in co-engaged, generative research from the following points of view:

- We need to give attention to our ways of being which requires that the researcher is reflexive. The researchers' theory, role and methodology all interact to produce meaning in and from any research process and this needs researchers to take careful account of the research process.
- We need to adequately recognise the engaged materiality of being a researcher, and to recognise researcher as citizen, as part of the interactive and expansive learning processes that are the subject of transformative learning i.e. in a formative interventionist role this must be made explicit from the start and the role of the researcher in such a context must be agreed to by participants in the case studies.
- Recognise that immersion in a case study context also opens up spaces for critical reflexivity.
- Researchers should not be shy to discuss or expose their own vulnerabilities in the context and to share openly with participants what their interest is in the research (we are all humans seeking a more sustainable existence in the face of climate change and other societal and social-ecological risks and injustices).
- Develop a balance between openness to emergence and focussing on critical moments in the research.
- Undertake reflexive journaling in context to take account of own formative role and responsibilities in the research process.
- Researchers have an important possible role to serve as capturers of information and data that can also serve as a form of a “mirror” for the context of the research.
- Insider-outsider relations need to be discussed with research participants through conversations created via a commitment to listening, empathy and openness.

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