THE TRANSGRESSIVE GARDENER

Cultivating learning-based
transformations towards
regenerative futures.

Thomas Macintyre

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Neil Macintyre: May the apple never fall far from the tree!

Ida Kloster-Jensen: The unique and eternal bond between a mother and son

Anna Macintyre: "children of the same parents, each of whom is perfectly normal until they get together"

Heila Lotz-Sisitka: Personification of strength, dedication, and caring

Gerard and Luz Aida: The joy and support of los super suegros!

Finca Los Tres Monos: Fumid, wet earth, 50 shades of green, and a place to call home.

Vania, Stafan and Vilda: An italian haven where a friend is met with sourdough pizza, an IPA beer, and a two headed beauty of a beast

Chapter 1: Introduction to the Transgressive Gardener
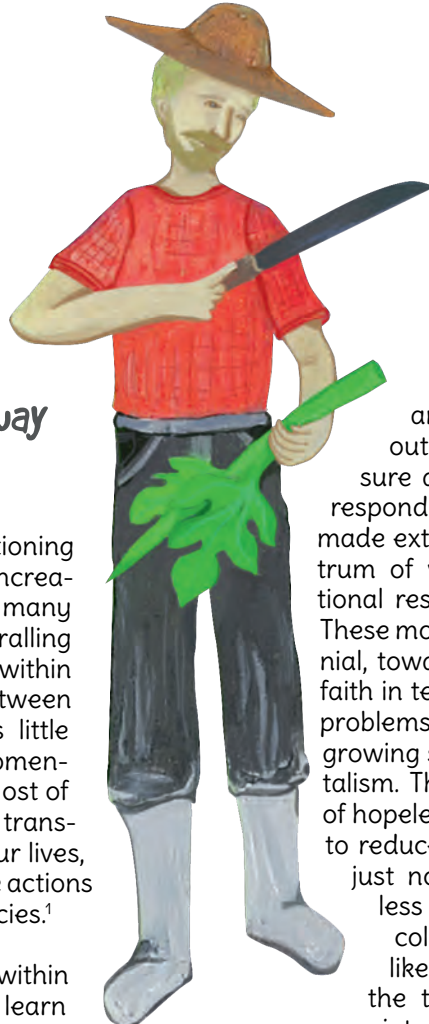
1.1. Questioning the way we learn

This story is about questioning the way we learn in an increasingly uncertain world. As many of us look around us at spiralling ecological destruction, and within ourselves as we struggle between hope and despair, there is little doubt that we are at a momentous planetary crossroad. Most of us need to make immense transformations in how we live our lives, and the sum of our collective actions will decide our fate as a species.[1]

So can we learn to live within our planet's limits? Can we learn to live lightly and in harmony with earth's creatures and creations? These are the questions of our time, and with no easy answers, and time running out, there is increasing pressure and stress on our ability to respond to these challenges. This is made extra difficult due to the spectrum of value-saturated and emotional responses being put forward. These move from climate change denial, towards those with a prevalent faith in technology as a fix-all to our problems. Worryingly, there is also a growing sense of climate change fatalism. This is expressed as a sense of hopelessness that try as we might to reduce our carbon footprint, it is just not enough [1]. We can eat less meat, bike to work and take cold showers, but it seems like just a drop in the ocean of the transformations needed to maintain a habitable planet.

Amidst this hopelessness, however, are individuals and communities that believe that on-the-ground action can lead to real change. These are the people who do not believe the fatalism story - 'there is nothing we can do' or the story of 'business as usual'. Making

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1 | By using the pronoun 'we' I realize that not all readers will identify as belonging to the 'we' I am referring to. The 'we' is used here for a general sentiment that exists in the world, while fully recognizing that there are also other sentiments that can be quite different and equally legitimate.

up what author Paul Hawkins [2] calls the 'silent movement,' this growing movement of people and organizations believe that we cannot sustain a world based on outdated ideas of progress and control over nature. In short, we cannot continue believing in a growth paradigm on a planet which is limited by ecological boundaries. From the extinction rebellion taking place in London, and across the globe, involving civil disobedience in favour of democracy and climate change justice [3], to community food initiatives connecting consumers and producers [4], people are taking matters into their own hands to disrupt the status quo and bring about change.

Fundamental to such change is the role of education in the necessary transformations towards more environmentally sustainable and just societies. Education shapes values and perspectives, and contributes to the acquisition of skills, concepts and tools that can be used to reduce or remove unsustainable practices and to develop more sustainable ones [5]. Education for Sustainable Development (ESD) is considered vital in preparing citizens for the future, providing a framework for achieving the goal of universal quality education, as stated in the Sustainable Development Goal (SDG) 4 of the United Nations [6]. Yet beyond education being a somewhat instrumental tool to implement the SDGs and to shape human behaviour [7], there is a deeper questioning taking place about the purpose of education in the first place. Alongside the need to embrace and achieve the 'outer work' of the SDGs - manifested as material improvements in peoples' lives - educational policy and practice need to contribute towards the 'inner work' of changing values, beliefs and norms leading to a "deeper change in consciousness which can reconcile people and planet." [8]

1.2. Positioning this thesis in metaphor

During my doctoral research, I have increasingly realized that for inner and outer transformation to take place, we must develop the ability to move beyond the structures, paradigms, and norms which sustain a highly addictive, but ultimately destructive status quo. We must explore new forms of education and learning which encourage us to be critical and reflect on the world we want to create together. To this end, I have worked closely with community members of grassroots initiatives in Colombia around the issues of climate change and learning. Working with people who are actively trying to lead more socio-ecologically responsible lives, and sharing the joys and frustrations of trying to practice such an ethic, has culminated in my understanding that moving towards sustainability has no recipes, and is a rough and messy process. In light of these challenges, I position this thesis amongst other critical voices within the field of ESD [9,10], with the ultimate understanding that we need to **learn** our way to sustainability [11].

In this endeavour, I have been drawn to the concept of **transgressive learning**, which is the red thread which binds this thesis together. In general terms, transgressive learning is a form of transformative learning which addresses structural barriers which inhibit meaningful societal transformations [12,13]. At a deeper level, we can understand transgressive learning as a *"regenerative, conflictive and hopeful process which involves diversity and drives changes in stubborn cultural practices and identities for sustainability, and triggers change for sustainability in times of (dis) comfort at different levels, scales and in spaces"* [14].

Transgressive learning has been expressed through two winding paths on my research journey. In one direction, academic cob-

blestones have been laid down through publishing peer-reviewed articles, presenting findings at academic conferences, and contributing to the realm of scientific knowledge. The other path is more of an overgrown, dirt trail, where I have messily walked the elegant talk of contributing meaningfully to action-based transformations with the people and communities I have worked with. Trying to merge these paths of knowledge and action, through questioning assumptions about the nature and operationalization of transformation [15], has been a dynamic tension in my research.

A personal way to address this tension has been incorporating my research into my life project of promoting place-based regenerative practices. After many years of being on the move, talking about transformation, but being disconnected from where I have been living, I began to feel the need to put down roots in the territory I inhabited. This led my family and I to acquire a piece of land in the coffee region of Colombia. This land was basically a **potrero** - a paddock for grazing cows - albeit surrounded by lush, native forest. There was a desperate need to regenerate the land and transform it to an example for how to farm and live sustainably. I willingly took up this challenge, planting bananas and native trees, becoming involved in community projects in the area around the farm, and becoming friends with the howling monkeys in the bordering forest.

Academically, I have consciously addressed the knowledge-action tension through defining my thesis as an action research project. In broad terms, action research involves scholarship–practice with a focus on multi-stakeholder engagement and a change agenda [16]. I have been particularly inspired by the work of Colombian sociologist and action researcher Fals Borda who encourages the researcher to go through a process of decolonisation from the dominant expert-based institutional logic, towards assisting intellectual and political movements for peoples' self-reliance and empowerment

[17]. Through working with grassroots communities in Colombia, I took this as an invitation to research not just the transformations in these communities (the outer), but also attempting to embody the transformation taking place inside of me (the inner) through being open to having my beliefs and values questioned through interaction with people different than myself. I was trying to understand what it means to be intrinsically inseparable from the processes I was studying.

In my quest to operalize transformation, I have focus on place-based education and critical pedagogy in my research [18], where I have strived to work with a range of people and communities across different sectors of society. Yet a constant struggle has been how to carry out a transdisciplinary research project which integrates the oftentimes conflicting areas of academic higher education and community-based learning. Such multi-stakeholder collaboration is vital in higher education [19], but negotiating the diverse needs and interests of different academic and non-academic groups is challenging. I was going to need concepts and tools to help me understand and connect the transformation processes I was researching. I was also going to have to find a way of dealing with the inherent subjectivity of a form of (action) research which seeks transformation in society, while at the same time intersects with one's own growth areas, beliefs and values [20].

The eureka moment occurred during a workshop I was facilitating on transgressive methodologies with other early-career researchers (this is developed in chapter 7). Different metaphors emerged from participants in how they understood transformation. I was surprised to see one of the metaphors include a person gardening, and I immediately connected to this metaphor. Gardening allows me to shape, and be shaped by the world around me. I can dig my hands into the soil, sweat, while also relaxing and being happy. Connections began to form in my mind. I was cultivating not just plants

on my land, but also new forms of learning and transformation in the action research project I was leading. As the gardener intervenes in nature, seeking beauty and productive harmony through observation, reflection and action, so was I intervening in the lives of others in an attempt to 'transgress' rigid structures and unsustainable behaviour and practices through learning. I was outside the metaphor as well as inside, transforming and being transformed. I was a transgressive gardener inside a complex learning ecology.

1.3. The research objective and questions of the transgressive gardener

So my thesis now has a title: the transgressive gardener. The main objective of this thesis is to explore the role of transgressive learning in disrupting normalised, unsustainable behaviour, cultivating learning-based transformations towards regenerative futures.

As a means to focus in on the specifics of my study, I hereby present my research questions, being fully aware that the question can sometimes be more important than the answer in a rapidly changing world of competing values and interests [21].

Main research question:

To what extent can transgressive learning, as a more radical form of learning-based change, lead towards more regenerative transformations?

Sub-questions:

1 What are the learning orientations and approaches that encourage change and transformation in the context of climate change?

2 What are researcher qualities that can help establish more transgressive forms of learning-based change?

3 What are the levers and barriers to realizing transgressive learning, ensuring that such learning is generative instead of destructive?

4 How can transgressive learning spaces be designed and facilitated so as to link higher education to community-based learning?

The above research questions have been the catalyst for my three-and-a-half year action research project in the South American country of Colombia. This project has made up the backbone of the Colombian case study of the international project called **T-Learning** (Transgressive Learning for Social-Ecological Sustainability in Times of Climate Change). The T-Learning project involves nine case studies, covering four continents: Sweden, the Netherlands, India, Vietnam, South Africa, Malawi, Zimbabwe, Ethiopia and Colombia. Each case study has investigated and characterized the emergence of T-learning processes that lead to radical transformations towards sustainability within the framework of climate change.[2] An inspiring part of this international project has been yearly gatherings with partners, where we have shared experiences and together explored the conceptualization and operationalization of 'T-Learning' - an umbrella term for **Transformative, Transgressive, Transdisciplinary and Transcendental** learning. I have led the case study into the Colombian context, focussing on the transformative role of community learning, and how this learning can be connected to higher education. This topic is important at a global scale so as to bring new forms of knowledge to help us address global challenges [22], but also particularly in the context of education in rural areas of Colombia, which is experiencing low coverage, lack of quality and equity, and limited relevance of its contents for rural communities,

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2 | The T-Learning project is organized by the International Science Council (ISC), as part of the Transformations to Sustainability (T2S) Programme. For more information see: www.transgressivelearning.org

thus hindering their ability to respond to the social and environmental needs of their context [23].

In the Colombian T-learning case, we have followed a participatory territorial approach [24], which aims to respond to the needs of people and the environment in the countryside, taking into account the cultural, socio-economic and environmental diversity of the territories. At the same time, we have tried to narrow the gap between community realities and higher education by bringing multiple actors together to collaborate in T-learning settings designed to be trans-

formative. Through working towards a more responsible research and innovation perspective [25], we address the critique that higher education has become an individual and personal project, where educational objectives are directly related to objective standards, indicators and accreditation benchmarks [26].

In the following chapter you will be introduced to the theoretical framework behind this research, as well as the innovative approach taken to represent my doctoral research through peer-reviewed articles and a transformative narrative.

Definition of Transgression:

- The act of transgressing; the violation of a law or a duty or moral principle
- The action of going beyond or overstepping some boundary or limit
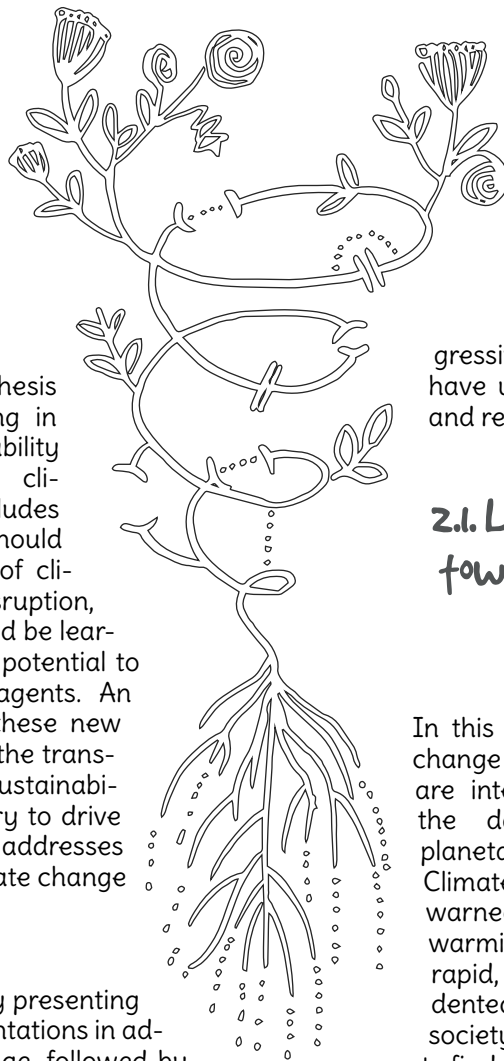
At the heart of this thesis is the role of learning in addressing sustainability challenges, including climate change. This includes not only **what** we should be learning in times of climate change and disruption, but also **how** we should be learning to maximise our potential to be positive change agents. An important aspect in these new forms of learning are the transformative praxis for sustainability sciences, necessary to drive learning that really addresses the challenges of climate change [27].

I begin this chapter by presenting different learning orientations in addressing climate change, followed by a theory of transgressive learning. I then finish by presenting the Living Spiral framework, which provides my understanding of the nature of transformative and trans-gressive learning, and which I have used to analyse, structure and represent my research.

2.1. Learning orientations towards meeting the 1.5 degree target

In this story's context of climate change and unsustainability, there are intensifying debates around the dangers of overstepping planetary boundaries [28–30]. Climate change experts have warned us that "limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society" [31]. The heat is literally on to find answers to how to catalyse such change.

Before getting into the needle and red thread of transgressive learning, which

weaves this story together, it is important to situate transgressive learning within a framework of learning forms. In a literature review paper I published with colleagues (see appendix 1), we explored the learning orientations and approaches that encourage transformation on the path to achieving the 1.5 degree C target [32].

Figure 1 below shows the different approaches organised around a continuum of learning theory research. These range from more behaviorally oriented learning, to more inclusive and transformative modes of learning that emphasise reflexivity, capacity-building and competence. The two axis provide an interesting way to generate this continuum. On the vertical axis is the juxtaposition between predefined/prescribed approaches to learning, and open/emergent learning approaches. On the horizontal axis is the division between authoritative learning approaches focusing on 'matters of fact' (where we know what needs to be done and how to act with relative certainty), and participatory learning focusing on 'matters of concern' (where we have a vague idea but do not know for sure and need to engage people in a co-creative quest).

Each of the learning orientations shows specific motives, approaches and learning-related issues that are helpful to consider on the pathways to limiting rising temperatures to 1.5 degrees. Hulme [34] notes that there are multiple, and creative applications of the idea of climate change that do not necessarily require agreement, as they "thrive in conditions of pluralism and hope, rather than in conditions of universalism and fear" (p. 363). This is a short description of the four approaches we explored:
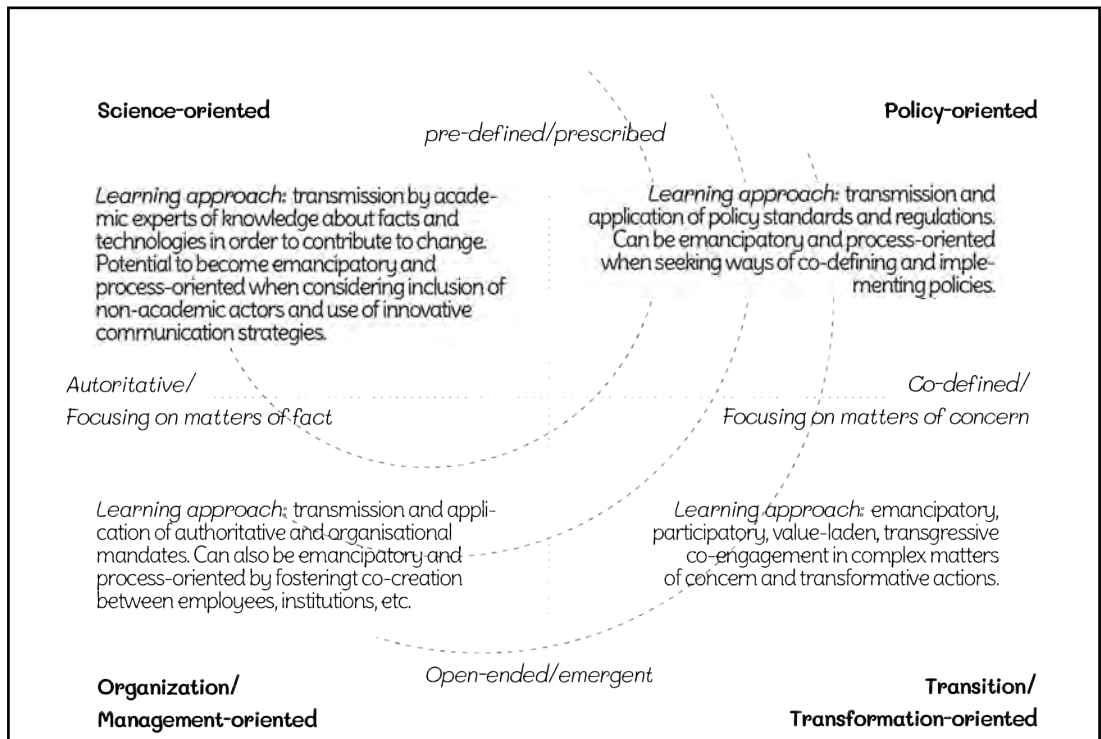
Figure 1. Learning approaches. Taken from Macintyre et al. [32], initially developed by Wals and Jickling [33]. The green lines represent the movement from technical approaches and often pre-prescribed solutions towards emergent and multi-perspective approaches.

Science-oriented learning:
Follows a fundamental assumption that scientific and technical knowledge can drive change, reflecting an instrumental approach characterised by a 'transmission mode' [33]. In this form, knowledge of scientific facts about climate change is transferred with authority to learners, with confidence in the knowledge and the course of action to be taken.

Policy-oriented learning:
This approach foregrounds the importance of learning as a means of enhancing policy implementation for achieving change. Here key policy drivers for climate change responses are mitigation, adaptation and resilience approaches. In this literature, emphasis is placed on direct transmission-based learning, but also on reflexivity expressed in the discourse of triple loop learning [35] and participatory learning [36].

Organisational and management-oriented learning:
This quadrant tends to foreground the need for learning as a means of achieving organisational mandates or management objectives, which in turn can contribute to change. Cundill et al. [35] focus mainly on the role and significance of learning in building social-ecological system resilience in natural resources management contexts. They argue that because social-ecological systems are complex and changing, social learning is necessary for the management and resilience of natural resources. This type of learning seeks changes in social units and changes at multi-levels [35,37].

Transition and transformation-oriented learning:
This quadrant tends to follow the assumption that fundamental changes are needed in our society, at the level of beliefs, values, actions and societal structures. It highlights the complexity of learning in multi-voiced, inter- and transdisciplinary or social movement formations. In such education and learning

contexts, it is not possible to deal with 'facts only' [38,39]. In addition, it requires engaging more with 'matters of concern' [40] in more open-ended, political and value-laden ways in and amongst wider social movements and inter-sectional communities [41]. Here ethics, decolonisation, well-being and sustainability become some of the orienting narratives for transformative learning.

Referring back to research sub-question one in section 1.3. (What are the learning orientations and approaches that encourage change and transformation in the context of climate change?) the above demonstrates that all approaches are valid and necessary for sustainability transformations to occur. However, we argue that moving from technical approaches and often pre-prescribed solutions towards emergent and multi-perspective approaches can help address the root causes of climate change, and eventually contribute to curbing global warming, even though this means increasing time, contestation and negotiations [32]. In this thesis I explore this theoretical contention in practice. The next section shows how transgressive learning fits into the above framework.

2.2. Learning to transgress and transgressing to learn

Definition of Transgression [42]:
• The act of transgressing; the violation of a law or a duty or moral principle
• The action of going beyond or overstepping some boundary or limit

From times of old, the concept of 'transgression' has been used to forewarn believers of the dangers of overstepping the laws of the divine. A sin is a transgression against God, "the violation of a law or a duty or moral principle" [42]. We can see similar parallels with today's planetary crisis. Beyond the scientific debate, climate change is a moral issue, questioning our right to over-consume resources, disrespect nature, and put into

disbalance the very earthly conditions which keep many species alive, including us. At a biblical scale, taboos have been broken, and as human induced climate change exacerbates the unpredictable forces of nature, another catastrophe is seemingly just around the corner.

Yet transgression can also mean something else: "The action of going beyond or overstepping some boundary or limit." [42] Rather than something inherently negative, this subtle difference highlights the crossing of boundaries and exploring what lies on the other side. How many of us have not wanted to learn new and impossible things, to challenge our limits, to do something that no one else has done? We can call the socially accepted way of doing things 'norms,' and they are the collective representations of acceptable group conduct. Norms keep society stable and organised, and strongly resist change. Unfortunately, our current societal norms have left us in a sticky quagmire of unsustainable living. This is exacerbating climate disruptions, with climate change being hailed as the greatest threat to our existence [43]. There is little doubt that the status quo of the current economic paradigm and disconnection with nature must be heavily disrupted for mankind to develop more regenerative relationships with the environment.

Although not a term common in everyday language, 'transgression' is often used to question norms and limits at the heart of evolution and development: from music [44] and fiction [45] to research policy [46] and gender [47]. It is worth noting that the concept 'transgression' is often used quite vaguely to imply some form of boundary breaking action, but a deeper conceptual grounding is seldom provided. When we connect transgression to the realm of learning, we reach a more radical form of questioning and acting out of what transformations to sustainability, or ESD, could mean in diverse contexts.

Locating transgressive learning in the bottom right quadrant of Figure 1 above, this form of learning challenges that which has become normalized or that which is acted out as the (unsustainable) status quo. Branching out from the trunk of transformative learning, the particular influences of transgressive learning can be found in reflexive social learning and capabilities theory, critical phenomenology, socio-cultural and cultural historical activity theory, and new social movement, postcolonial and decolonisation theory [48]. One of the first people to use the term transgressive learning was bell hooks[3], in her pioneering work in the field of critical theory and feminist thought in the classroom [49]. This has led to further research on transgressive learning in teaching pedagogy in (higher) education [48,50–53], as well as the transgressive role of the researcher in decolonizing research practices [12,54].

Transgressive learning connects well with the fields of transformation and transition studies which are gaining traction in academia [55]. Rather than the buzzword 'change', with emphasis on external factors generating changes in society, there is an increasing realization that business-as-usual is not good enough to address such grand challenges as climate change. O'Brien and Sygna [55] note, however, that transformation is understood in many different ways, from a qualitative change in form, structure or meaning, to the altering of the fundamental attributes of a system, such as a value system. It has also been observed that as useful as concepts like 'transformation' are for uniting people and ideas around the need for large scale changes in society, they do not address underlying power relations [56]. It could be argued that, like concepts such as 'sustainability', transformation is losing its edginess in promoting a shared commitment to alternative futures.

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3 | Bell hooks is the pen name of writer Gloria Jean Watkins (1952-), who chooses not to capitalize her name so as to place focus on her work rather than her name.

A reason for the ambiguous nature of transformation can be seen in critiques of how discourses on transformation relate to real change on the ground. Having buried myself in the inspiring literature on transformative learning, I was surprised to come across a paper by Newman [57], where the author shares his 'mutinous thoughts' on the contribution of transformative learning. Newman argues that the gap between the grand rhetoric of transformative learning, and how it is supposed to unfold in practice, is so large that the concept has no real meaning. In Newman's view, it should be scrapped and replaced by the more ambiguous term 'good' learning [57]. This is reminiscent of the recognition that education for sustainability in the end is about 'good' education [58].

Although I do not share the desire to discard concepts such as transformative learning, or ESD, which is also a problematic concept [9,10], it is interesting how concepts and words evolve as different interests and experiences render them more or less meaningful. For example, I prefer the concept of 'regeneration' in this thesis, instead of 'sustainability'. Author Daniel Wahl defines regenerative cultures, as "capable of continuous learning and transformation in response to, and anticipation of, inevitable change. Regenerative cultures safeguard and grow biocultural abundance for future generations of humanity and for life as a whole." [21]. When I refer to 'regenerative' futures in this thesis, I feel it better captures the healthy and dynamic planet I envision being part of. We have destroyed so much of the planet we live on, is it not better to regenerate what is broken, rather than 'sustaining' what is left?

And so it is with learning. Many of us want to transform ourselves and society, and education is a fundamental part of this. But there are strong arguments that we must go beyond the mind-based transformations of the cartesian world, beyond the conviction that technology will save us at no great cost, and towards a realization that we are related to what is around us and within us [59]. The underlying contention of this thesis is that major shifts in how we learn through our 'head', 'heart' and 'hands' are needed so as to move towards more regenerative societies [59,60]. We need to learn to transgress, and transgress to learn.

As a 'concept in construction', transgressive learning is still finding itself in a rapidly changing world. T-Learning colleague Stefan Bengtson argues that there is no definite understanding of transgression, as transgression itself involves the undermining of rules and boundaries [61]. However, this subversion of rules and boundaries provides, at least, an idea of what transgression is or could be. Table 1 below presents some characteristics for transgressive learning (see appendix 2):

1	Ethics of transgressive learning is based on a philosophy of caring which balances the warrior stance of activism with the empathic pose of vulnerability.
2	Transgressive learning, based on disrupting structural hegemonies of power, is a form of transformative learning.
3	Transgressive learning addresses 'wicked' sustainability issues [62] characterized by their complex, fluid, and transient nature.
4	Transgressive learning as a methodology is normative and characterized by 'ecologies of knowledge.' [63]
5	With their emphasis on participatory, reflective and narrative approaches, transgressive methods are performative by nature.

Table 1. Characteristics of transgressive learning, based on Macintyre and Chaves [12].

2.3. The Living Spiral Framework

The question then arises as to how we can understand, analyse and present more transgressive learning experiences. The roots to addressing these questions lie in a Transformations to sustainability workshop in 2016, where T-Learning members developed a theory of change model, which was later called the Living Spiral (see figure 2 below).[4] At the early stages of my doctoral work, I immediately felt drawn to the Living Spiral metaphor. I connected to the organic spiralling structure signifying rebirth and regeneration, a metaphor also widely used amongst the grassroot initiatives that I was working with in Colombia. I was also inspired by the ecological metaphor of the plant, as well as the conceptualization of the different learning stages which I felt connected well together. I decided to use and develop the Living Spiral model through my research. The following points explain the elements of the Living Spiral, whereby the different learning stages are presented on the right side of the figure, and the learning aspects on the left side of the figure:

The Living Spiral metaphor

Seeds
Reflexive re-seeding for new connections and life (scaling out), sharing t-learning processes, pedagogies, curricular across diferent contexts.

Blossoms
Flowering of transgressive learning outcomes and actions (scaling up reflexively expanding learning processes).

Leaves
Growing learning processes in their fullness-developing pedagogies, curricular, expanding learning actions.

Stems
Spiraling moments and processes - overcoming barriers, challenging norms, recognizing invisible, absent processes.

Shoots
Sprouting small actions and do-able changes - spaces for innovation and reflexive action.

Roots
Recognizing our roots and the soil we live in (cultural/historical context and knowledges - Scaling Deep).

barriers
— process
moments
..... invisible processes
(....) active absence

Figure 2. The Living Spiral Model. Taken from Macintyre et al. (2019)

Roots of a plant represent the grounding of a process in its cultural-historical context and the consequent 'matters of concern' of research subjects. Where did the process begin? From what context and concerns did it emerge? What traditions, worldviews, and conventions underpin its context?

Shoots are the materialisations of small actions and do-able changes. Shoots have the potential to act as a platform for generating further transformations, absorbing nutrients via the plant's roots. We can identify shoots as 'germ cells' emergent in our processes [64], in other words, activities that can potentially catalyse transformation.

Stems evolve from shoots if they are able to challenge and overcome initial barriers to their realisation. When a transformational processes has reached the stems it is time to recognize the learning aspects involved (located at the bottom left of figure 2 above):

Barriers are lock-in mechanisms that make change difficult. These may be cognitive, cultural, and/or structural challenges to realizing meaningful transformation. Dominant paradigms such as economic growth and championing individualism to promote well-being can be barriers for social transformation, deeply entrenched in most societies.

Processes highlight how learning stages are connected, with transformation being a lifelong process, rather than things that can be 'learned'. It is important to realize that learning comes in many shapes and forms, from individual processes to social learning in groups.

Moments are the 'aha' experiences which provide opportunities for deep reflection and insights into how to catalyse transformation. What are specific moments that made us question our actions and beliefs? How did we arrive at these moments, and to what extent did they transform our values and worldviews?

Invisible processes are the tangible but invisible threads which connect learning stages together, but require different perspectives and innovative thinking to recognise and understand them.

Passive and Active absences requires attentiveness to what is - and what is not - present in the processes we are exploring: What actors are absent? What perspectives are missing? How do these absences affect the results? Absences are passive when their absence is accidental, not premeditated, in what we can call blind-spots. Absences are active when the actor decides not to be present, or when a specific perspective is deliberately excluded from the process.

Leaves evolve out of stems when barriers and tensions are overcome, resulting in the grounding and growing of learning processes. Leaves represent energy for the process to continue over time, for example, developing pedagogies or curricula in institution, or learning activities which become periodical and generate solid, long term changes.

Blossoms and fruit appear when a process has been successful, both at the level of the individual and the community. At this stage the process becomes an example for people from outside the process who arrive, learn and become inspired, thus pollinating other processes and fertilizing new ideas.

Seeds are the final units of replication that can be stored, planted in other contexts, or thrown into the air to see where they land and geminate transformation. Seeds take the form of stories, reports, methods, results, new perceptions, skills and tools.

Recognising narratives as a powerful means of sharing experiences and connecting different forms of learning [65], I have worked with colleagues Martha Chaves and Dylan McGarry to transform the Living Spiral model into a framework for understanding, generating, and analysing transformative narratives [66].[5] This framework balances structured learning steps with emerging and organic experimentation, providing a step-by-step guide for discovering how and to what extent, personal and collective learning journeys result in transformations to sustainability (see table 2 below).

The Living Spiral has been used in my research in different ways. First, to generate and share transformative narratives with community participants in the context of climate change (appendix 3) [13]. One of the strengths of the Living Spiral framework is that it helps organize research findings, and as an analytical tool, can help identify learning stages in transgressive research (appendix 6). Second, as an arts-based framework, the practical exercise of translating experiences and reflections into a narrative and drawings of transformation in different contexts and levels, opens up conversations

Method:
The steps of the Living Spiral framework

1 Identify the process of transformation you want to explore: What experiences would you like to investigate and narrate?

2 Reflect on the Living Spiral framework: conceptualize your process using the metaphors of roots, shoots, stems, leaves, flowers, fruit and seeds.

3 Consider changing the living spiral model to reflect your own process: The Spiral model is a simplified representation of different stages in a transformation process. You may want to change the model to match the way you understand your process.

4 Go deeper into the narration of your process: This is the moment to look for barriers, significant moments, invisible processes, passive and active absences, and anything else that you consider important to investigate in more depth.

5 Critically analyze your Living Spiral: By re-reading your narrative with a more reflective and investigative perspective, look for repeating patterns, deepen and compare the moments and processes of your spiral.

6 Participatory analysis: If you want to connect and compare your results of the personal living spiral with that of your collective process, ask yourself at which moments they influence each other? What connections do you find? At this stage you can compare your results with those of other cases and contexts.

Table 2. The steps for creating a Living Spiral narrative. Taken from Macintyre et al. [66]

5 | The Living Spiral framework provides a valuable resource for the reader of this thesis, and can be accessed at: http://transgressivelearning.org/wp-content/uploads/2018/10/Living-Spiral-Framework.Marco-conceptual-del-espiral-vivo.pdf

around the levers and barriers to transformation, and personal stories help develop empathy between participants of different values and worldviews (see chapter 7). Importantly, the shared structure around the Living Spiral model allows analysis at a collective level, exploring common patterns and differences at the diverse levels of transformation.

2.4. Transgressing the 'norm' in the written representation of a thesis

Fulfilling the doctoral requirements of Wageningen University, the Netherlands, I have published peer-reviewed articles and chapters, presented relevant topics at conferences, and completed a training and supervision plan. In addition, as part of the international project T-Learning, I have co-organised a research school and international conference, and written numerous academic blogs about the research process. In addition to publishing peer-reviewed papers, it has become increasingly clear to me how important it is to experiment with how we represent knowledge, and how this knowledge can lead to transformative action. Although scientific publications can lead to new theoretical insights which can inform other researchers and institutions, the danger is that the focus is on writing to publish, rather than writing to transform lives. Throughout my research I have been grappling with questions such as how as academics we can represent our research so it does justice to the rich and complex processes in which it is embedded, and how to address the researcher's complicated role in transformational processes.

The 'normal' format for writing a thesis at Wageningen University is to write an introduction outlining the problem, research questions, key concepts and the methodology and methods used to investigate the

questions. Four peer-reviewed papers are then 'stapled' into the thesis after the introduction, with a synthesis chapter finishing off the thesis with critical reflections and recommendations. While an efficient means to write a doctoral thesis, the 'staple' thesis does not necessarily make for a good story. In a world where facts have multiple realities, and science and society are becoming increasingly polarised, I feel there is an invitation to bridge academia and other literary fields by writing a thesis more accessible to the greater public.

An important moment during the writing of this thesis came when it occurred to me to use the Living Spiral framework as the narrative and analytical tool to tell my research story. I had used the framework to explore the transformative processes of research subjects through their narratives. So why not experiment with the 'researcher as narrator' [67], whereby I would tell a 'story' from the first-person perspective. In this way I would be 'bearing witness' to the transformations taking place at such a critical moment in planetary history [68], and addressing my own subjectivities along the way.

The format of this thesis therefore holds an element of transgression in that it deviates from what is currently considered 'normal' in academia, where published material takes center stage. Next to objectively contributing to theories and concepts and discussing research approach, methods, findings in this thesis, I attempt to communicate scientific work and findings into an inspirational, personalized and accessible narrative, through employing metaphors and drawings as a means to activate multiple forms of learning through a head-heart-hands approach [59,60]. This can provide a more integrative view of the doctoral research undertaken, and a more comprehensive communication to a wider scientific and practice-based audience, potentially enhancing its societal impact next to the scientific one.

The aim then of the following chapters 3-9,

is to tell the research journey as a narrative, through the learning stages of the Living Spiral framework, balancing the result-based voice with the transformational processes of the researcher. Appendices 1-6 correspond to the peer-reviewed papers, and tell the same story in 'another language', a scientific one, concentrating in the research findings *per se*, while giving less depth to the transformational journeys involved in the research process. We will now finish this chapter by reading about my personal Living Spiral representation which symbolizes and accompanies this research journey.

2.5. The Unfolding Story of the Botón de oro

After many years of livestock overgrazing, there was a desperate need to regenerate the soil of the land we had taken responsibility for. One way of accomplishing this was through planting fast growing shrubs which would provide shade for the earth, flowers for the bees, and green manure as fertilizer.

The quick growing, flower abundant botón de oro (Tithonia diversifolia) is excellent in this regard. Commonly referred to as tree marigold, or Mexican sunflower, because of its large yellow flowers, this plant reproduces easily and is very versatile. It has a high protein content which makes it nutritious for a large diversity of herbivores, and because it fixes nitrogen in the soil, is widely used to restore degraded land. From a few botón de oro stakes donated from a neighbor, I began populating the land with this shrub, and whose flowers the bees are now savoring.

The botón de oro has been an important companion in my personal journey of connecting to the place I now inhabit. This is the reason why I chose it as the basis of my Living Spiral metaphor and story. A couple of months ago, while I was pruning back various botón de oro, I felt inspired to reflect over my research during the last three years. I gradually began drawing my own Living Spiral in the form of the botón de oro, populating the different learning stages and aspects of the model with my own experiences, following

Figure 3. The author beside a *botón de oro* on the land he is regenerating, Filandia, Quindio, Colombia.
Photo credit: Martha Chaves

the steps of the Living Spiral framework (table 2 above). You can see this drawing on the cover of this thesis, as well as below in figure 4, with the labels roughly corresponding to the sections of this thesis.

Finally, before we move into this story, I want to invite you, the reader, to keep an open mind while you read the following chapters.

Presenting a thesis as a transformative narrative is a risky endeavor. Weaving concepts, methods, and analysis into a story of personal transformation is complicated, and the thesis does stray from orthodox positivistic science. I share personal experiences from my childhood as well as during my research, with the contention that these experiences help explain my subjective understanding of
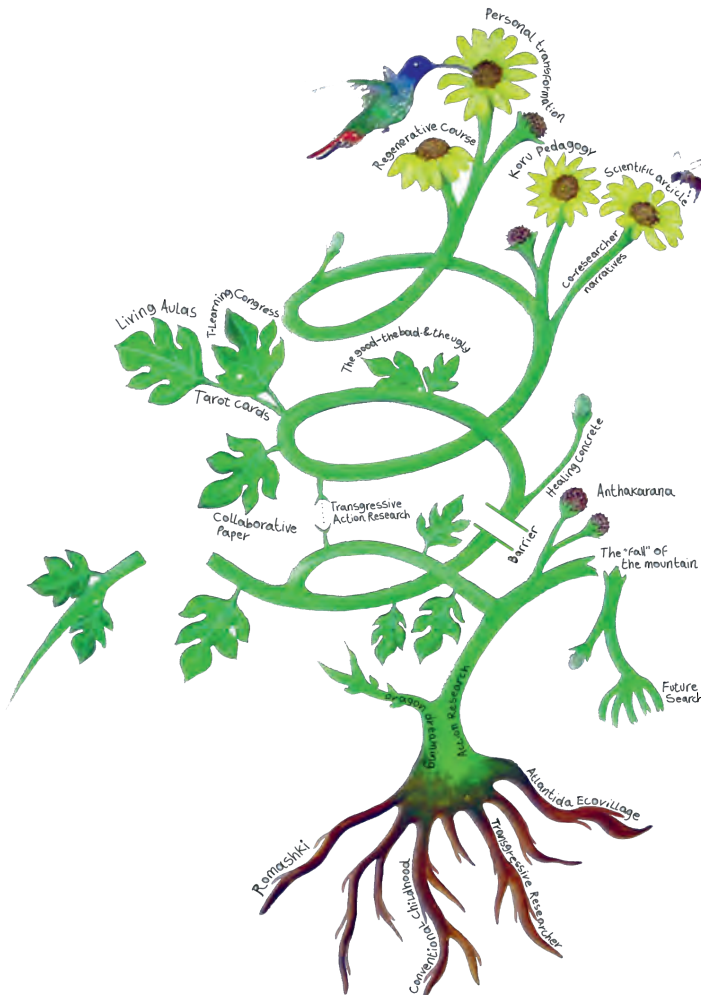
Figure 4. Living Spiral representation of Thomas Macintyre's research journey.

the world. I have preconceptions about values, theories, and behaviour, and these will influence how I conduct and write up my research, thus it is imperative to be able to be aware of how my own lens influences what I see [69]. As I argue, research is performative - we help create the realities we research [12] (see Annex 2).

I have attempted to mitigate the detrimental effects of such subjectivity through the process of 'bracketing' [70], in which I suspend my assumptions, though keeping them visible, so as to be open to the accounts and experiences of research participants [71]. This process requires reflexivity on the part of the researcher, being honest and attentive to beliefs and values, assumptions and biases, which will affect the research practice. It is also especially important because this research project actively encourages transformations in researchers and participants, which involve ethical dilemmas and questions of responsibility in what is ultimately about intervening in the lives of others to bring about transformation [72].

We are now ready to move into the Living Spiral of my research, where you will encounter the roots, shoots, stems, leaves, flowers, fruit and seeds in my research journey.

Chapter 3: Roots – the setting of the doctoral stage

"A people without the knowledge of their past history, origin and culture is like a tree without roots."
Marcus Garvey

It is important to recognise our past so as to gain a better understanding of where we are moving towards in the future. Digging into the Living Spiral metaphor, we can appreciate that roots are dynamic and interconnected. They move their way through the soil, integrating and creating symbiotic and parasitic relationships with elements in the surrounding soil, creating a Wood-Wide-Web of subterranean relationships between plants, animals and fungi [73]. Like an underground forest, this story has its ecosystem of interconnections, cultural and historical roots, which provide the basis for all that grows above ground. In this chapter, we will explore how my roots have influenced the worldview with which I entered my doctoral research.

3.1. Conventional Childhood

As I write these words I have just turned 35 years old. I am caucasian, with shades of pink from many years of sunburn from my native land of New Zealand. Growing up in the New Zealand countryside, I went to a rural primary school where I learnt the traditional New Zealand Haka, and the lord's prayer in Maori, from a local elder called Pa. I played rugby and cricket, ate fish 'n chips, and seldom wore shoes. I moved on to a high school of 1400 boys, where it was considered a crime to raise your hand to answer a question. It was best to keep below the radar and try not to be bullied for being a 'nerd'. As a British Commonwealth country, the British Queen is our head of state, and we were taught the chronological list of English Kings and Queens, their policies and reforms, which were memorized and regurgitated at exam time.

It was a conventional educational upbringing, academic but uninspiring. While we copied model essays word-by-word from an overhead projector, I remember my history teacher lobbying a cricket ball in the air as he sat at his desk, an impatient look on his face. He was waiting for recess to come so he could play cricket with his teacher friends. I longed for the break to play rugby with my friends. At that moment, neither of us were where we wanted to be. Although this may seem a simplistic experience to sum up four years of highschool, I feel it reflects the lack of creativity and critical thinking I was insti-

lled with at school, where the cultural norm was to do as you are told, and try not to stick your head out above the others.

But I was always a little different from everyone else. Lurking behind my 'Kiwi' accent,[6] there lies something you should know about me: My mother is from Norway, which makes me half Norwegian. Situated on the opposite poles of the world, much of my life has been spent traversing the northern and southern hemispheres of Norway and New Zealand. I am privileged to have met many people, and experienced ways of living far different from my own. As an adventurer, I have been fascinated by the stories people share about their lives. Leaving the confining structures of timidness, puberty and bullying at a boy's high school in New Zealand, I travelled to Norway with my mother at age 17 to finish my last two years of highschool. For the first time I had girls in my class which improved my social skills, I learned about world history beyond colonial academia. I was growing in confidence. But I was still firmly entrenched in a linear developmental path. University would follow highschool and 'professional success' would follow university. In ignorant bliss, I was deeply uncritical of how the world around me was working. My rational self was leading the way, and I had not yet learnt that there were other ways of seeing and being in the world.

3.2. Transformation in the Ukrainian Countryside

Finishing high school in Norway, I returned to New Zealand where I began studying at the University of Otago. After some early hiccups[7] in balancing the 'work hard, play hard' mantra, I settled into a lifestyle of studying,

drinking with friends, hiking on weekends, and working in the holidays to pay off debt.

I completed a double-degree in Genetics and Economics. The morning after my last exam, I set off towards the Netherlands to study a Masters in nutritional genomics–the interplay between food and genetics–at the University of Wageningen. Taking an indirect route from New Zealand to the Netherlands, I flew to Japan, took a ship over to Vladivostok, on the eastern shores of Russia, and crossed the vast expanses of the ex-soviet bloc on the trans-siberian railroad. Aided by a bilingual dictionary and the ubiquitous bottle of vodka, I made friends on the train, and through a serendipitous chain of events, I ended up in a small village called Romashki, south of the Ukrainian capital of Kiev.

In this small village, I was to meet a family whom would transform my life forever. Pietro, a surgeon, and Olga, a lawyer, had become disillusioned with life in the city of Kiev, and had packed their bags and moved to this small village to live a back-to-the-nature lifestyle. With no prior experience in alternative living, they learned to grow their own food, rebuild their house with mud and straw, and wash themselves with clay from a nearby lake. Joining in their lifestyle, I picked mushrooms in the forest, slept on a bed of straw, and experienced amazingly spiritual and peace loving people so different from myself. During those nine days I lived with this back-to-nature family, something began to change inside of me. Nothing drastic, but the development of a new reference point in what a life-less-ordinary can look like in the countryside.

Arriving to the Netherlands, I experienced what has been called a 'disorienting dilemma' [74]. It began with a feeling of disconnection with the lab-coat classes of the natural sciences, a lack of joy in messing around with pipettes and dilution formulas. Where were the people? Where was the culture? Was this what I really wanted to do with my life? The answer was No! With a bachelor's degree in

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6 | Inhabitants of New Zealand are called Kiwis, after our national bird the Kiwi. It is a charming accent where "fish and chips" is pronounced "fush and chups", and "seven" is pronounced as "siven." It is important to note that the Kiwi accent is distinct from the Australian accent.

7 | A 'hiccup' is slang for a small problem or difficulty, which does not last very long and is usually easily put right.

Economics, I managed to change from the natural sciences into the Master program of International Development Studies, specialising in rural anthropology. I had found my place at the university.

Sitting one day in class listening to the critical stories of development from the book 'wasted lives', by the Polish sociologist Zygmund Bauman [75], my disorienting dilemma culminated in a eureka 'aha' moment. Instead of focussing on what was not working in society, why not research something unknown and different, off the beaten track of the status quo. I remembered back to the family and lifestyle of Pietro and Olga in Romashki. They represented a different relationship between man and nature, more attuned to the natural cycles and the essential needs of Man. Maybe I could study how they had set up an alternative life in the countryside. My supervisor supported the idea, and I returned to Romashki to carry out fieldwork and write my master thesis [see 76].

As mentioned in the previous chapter, transformation is an inclusive, unifying but rather vague concept which is difficult to translate into real life. However, after years of reflection, I can be honest with myself and say that my experiences in Romashki transformed my life. There was definitely a 'before' and 'after.' I had arrived to the community of Romashki "like a tourist being led on a tour" [76]. I had found the idea of an alternative life exciting, but from my own naive perspective. Carrying out participant observation research in the community of Romashki for four months pushed me out of my comfort zone. I experienced cold and loneliness, connection and disconnection, and importantly for my own development, the value of learning to live one's own dream, not someone else's. My romanticised naivety about back-to-nature lifestyles had been blunted, and my assumptions that I could understand everything around me, crushed. It was the first time I really needed to question who I was as a person, and how I related to everything that was around me. The world

seemed less straightforward. I was to leave Romashki a different person than when I arrived, with a desire to continue exploring the novel relationships that Man can make with nature in community.

3.3. Life as a family of researchers in an ecovillage

The following turning point in my life was meeting my partner in the university town Wageningen. With a shared desire to live a more communal life in the countryside, we moved to an ecovillage in south-west Colombia with our newborn child. As a doctoral student at Wageningen University, my partner's research entailed studying how grassroots initiatives were collectively articulating alternative paradigms for responsible, good living. This involved ethnographic and action research into the ecovillage Atlantida where we were living, as well as research into other sustainability initiatives who were part of the network of sustainability initiatives called CASA Colombia.[8] In my role as a research assistant, we were actively involved in the day-to-day activities of the community and the network, taking part in decision-making processes, while at the same time researching the people and community processes.

These academic and personal experiences were formative. I became intimately involved in the CASA network, learning about the diversity of grassroots initiatives who were experimenting with different models of development, especially buen vivir, which is an Andean philosophy of integrative and collective well-being. However, through visiting initiatives and researching their day-to-day practices, our research began to reveal the substantial challenges and contradictions of translating sustainability visions into practices [77]. At a personal level, these challenges

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8 | CASA stands for The Council of Sustainable Settlements of the Americas, and is the regional Latin American network of the Global Ecovillage Network (GEN). This story refers to the Colombian branch of the CASA network.

were embodied during auto-ethnographic research in the ecovillage Atlantida. As active members, my partner and I were now part of an intentional community of people walking-the-talk of sustainability. In Atlantida, this involved letting go to some extent my own individual self, trusting in the power of the collective intelligence, working for the good of the community and the territory over one's own material comforts. I was experiencing an alternative lifestyle of my own, while exploring novel relationships to nature.

Yet this gradual change in my worldview turned out to be a difficult experience. Little by little, the community of Atlantida began to fall apart around us due to miscommunication and personal differences between members. With the continual survival of the community reaching a critical point, the collective carried out a series of reflection sessions to explore what was happening. During these sessions it became clear that there was a myriad of underlying tensions between what we each individually and collectively understood community life to mean, and how we were enacting community-led sustainability in practice. Writing up these reflections from a social learning experience, my partner and I concluded that the disruptions in the community had provided the opportunity for members (including ourselves) to enter into a process of collective learning about our role in the community [78]. Though this had taken place in a tough reflexive environment, the process had resulted in deep insights about the assumptions we had of ourselves and one another [78]. Although my experiences in Atlantida and the CASA network had shown me new reference points for sustainability transformations in practice, it was clear that there were substantial barriers to realizing these transformations which merited further exploration.

3.4. The transgressive researcher: The setting of the doctoral stage

As a research assistant, I had been part of the research process, conducting fieldwork and co-authoring academic papers. The research I was part of identified the possibilities of transgressive learning in the initiatives and activities of the CASA network [79], facilitated by the inclusion of a diversity of multiple stakeholders engaging with one another in a transformative environment [80]. Towards the end of the research project, we were fortuitously invited into the International T-Learning project (see section 1.3.). I took responsibility for leading the Colombian case study as part of my doctoral research, with the focus evolving from the field of sociology of change, towards the field of EDS, in the form of exploring the role of transgressive learning-based change amongst community initiatives in the CASA network. As we had attempted earlier in our research in the community of Atlantida [78], we were especially interested in bringing community members into the research process to explore their own individual and collective transformations.

Having experienced the ups and downs of community-based research, I began my doctoral research by publishing a paper which addressed research sub-question 2 (section 1.3): What are researcher qualities that can help establish more transgressive forms of learning-based change? This paper was a critical reflection of what it means to be a 'transgressive researcher' in environmental education [12] (see appendix 2).

On the one hand, our research had shown the power of engaging in emancipatory forms of learning. I had been awed by the commitment of people with different ideas and worldviews to come together through experiential activities to search for a common purpose. Although such encounters had been

challenging as a researcher, such as living the often emotional disruptions in tight community settings, they showed me the importance of generating reflexive environments in which to facilitate the recognition of deep insights into evolving individual and collections assumptions about community life, for example, the role of leadership in a community [78].

On the other hand, I was also very much aware of the challenges and dilemmas for upscaling such learning processes towards the more large-scale transformations needed for addressing climate change [31]. Alongside current international movements such the extinction rebellion, which uses non-violent civil disobedience in an attempt to halt mass extinction and minimise the risk of social collapse [81], there are concerns that top-down politics can lead to eco-fascist regimes bent on saving the planet at all costs, while ignoring underlying causes of our planet's destruction [82]. There are clearly different ways for the researcher to approach the structural barriers to realizing societal transformations.

Reflecting on the above tendencies, my co-author and I concluded that the role of the transgressive researcher is to balance, in a reflexive manner, the necessary top-down instrumental stances transforming unsustainable practices, with more empathic learning approaches so as to build critical thinking and empowerment from the bottom-up.

Important for the transgressive researcher are the qualities of reflection, empathy and courage so as to better understand and act within the complex dynamics of current socio-ecological challenges [12].

With roots having been sunk into the fertile ground of grassroots learning in Colombia, and the opportunity to lead a project as part of my doctoral research, I was now ready to set up an action research project. The lens through which I was interpreting the world was the potential of transgressive learning to disrupt beliefs and values in people, which lie at the roots of human-induced climate change, rather than focusing on the manifestation of climate change itself. This would be based on participation with the people I was studying so as to contribute to knowledge and action-based change at the deeper level of connectivity, empathy, and community solidarity. Just like the soil is made up of millions of interacting bacteria, fungi, and other organisms, I had an inkling about the great diversity of life forms, ideas, feelings, and contradictions that I would encounter in my research. But that transgressive aspect of encountering conflict, uncertainty and simply things I did not understand, were things I could not have prepared for. Moving into the shoots of the botón de oro, we can see the following section as the germinating methodology of this story, the broad philosophical underpinnings of the research approach I have used.

Chapter 4: Shoots – Germinating an Action Research project (Methodology)

"Stay in the question and live your way to the answer"
(Ilona Koglin [83])

Shoots are the materialisations of small actions and do-able changes. They can be viewed as 'niche innovations' which have the potential to act as a platform for catalysing transformations [64], powered through the absorption of nutrients via the plant's roots. In this research, we can understand this catalysing platform as the action research methodology, where the philosophy of this research begins to take physical shape. In this chapter, I provide the rationale for the research approach of action research, and will explain the general strategy that I have used in my narrative: from the methodologies which have inspired this story, to how the project was set up, and the methods used.

4.1. Participatory Action Research

The broad methodology underlying this research is action research, which in general terms can be described as scholarship–practice with a focus on multi-stakeholder engagement and a change agenda [16]. It is the concern with directly addressing social issues which affect people in their day-to-day lives, which has attracted me to this research approach. With my interest in the role of the researcher in the research process, I have been particularly inspired by a sub-field called participatory action research (PAR), which emphasises the added participatory involvement of the researcher in what Colombian sociologist Fals Borda describes as 'praxis-inspired commitment' whereby the researcher goes through a process of decolonisation from the dominant expert-based institutional logic, towards assists intellectual and political movements for peoples' self-reliance and empowerment [84]. In line with what I contend with in the introduction, PAR challenges the positivistic approach to science based on knowable truths, control and authority and rejects a neutral stance to research, highlighting the subjectivity of the relationship between researcher and research subject [85]. I feel that PAR is a disruptive approach to conducting research through questioning dominant paradigms and assuming that knowledge is a co-creative process with research subjects, based on real action in the field. This makes PAR compatible with

the transgressive learning approach introduced earlier.

4.2. Mapping transformation initiatives and engaging co-researchers

The first step of exploring transgressive learning in the CASA network was to map the actors and initiatives who were engaging in transformative activities. My partner and I set off for the Call of the Mountain (CotM) gathering in the Amazonian eco-community of Anaconda del Sur. Taking place from 7-15 July, 2016, the event brought together CASA initiatives from all over Colombia for workshops, panel debates, dance, song and rituals.

As part of the PAR methodology, I actively participated in the organization of the CotM. This had been challenging because of the tough jungle conditions of mud and rain, insects and heat, and the logistics of organising an intercultural gathering with varying needs and expectations. Perhaps because of these tough conditions, the transformative spirit during this diverse gathering was palpable. I remember Indigenous children firing arrows from their bows into the trees, while ecovillage children marveled; Indigenous elders sitting around the fire mingling with ancestral spirits, surrounded by a mix of NGO representatives, international travellers and entrepreneurs. It was a big melting pot of collective tree planting, rituals, dancing, and discussions around sustainability and territorial rights. It was difficult not to feel my comfort zone challenged by so many people in one space, so different from me, coming together to work towards a more relational vision of the world.

To learn more about the participants, we carried out a mapping exercise to locate initiatives geographically and thematically on a map of Colombia. We also conducted semi-structured interviews with participants, asking the extent to which the CotM event was catalysing transformation in terms of challenging values and points of reference through experiential learning, as well as providing spaces for building alliances. From a learning perspective, responses overwhelmingly stated how the CotM gathering had been transformative in providing new reference points and collaborations with other people and organizations engaging in sustainability. However, the extent to which this transformative space was affecting structural barriers in the participants' own contexts was unclear. As we had learnt earlier, there is a significant gap between how a transformative spirit or vision is expressed in practice [77].

It became evident that to explore the transgressive nature of this 'transformative spirit', it would be necessary to follow concrete examples of participating community initiatives outside the CotM gathering. Following the participatory logic of PAR, I decided to invite three active CASA network members into the following stages of the Colombian case study. Rather than representing research subjects, they would act as co-researchers, investigating their inner and outer transformational processes in their respective community contexts, within the learning framework of the T-Learning project. I hereby introduce the T-labs and the respective co-researchers in charge, without whom this research would not have been possible:

Case study Ecovillage Aldeafeliz, San Francisco, Cundinamarca
Co-researcher: Tatiana Monroy

In the T-Lab of the Aldeafeliz ecovillage, we explored the emergent historical phenomenon happening in the center of Colombia: the encounter between the urban mestizo product of colonization and modernity, with the ancestral indigenous knowledge of the territory, which was believed to be forgotten and extinct. The central mountains of Colombia is where the largest moors exist on the planet, thus it is an important water reservoir, but it also holds the ancient memory of how to take care of it. Consequently, ecovillagers see in the 'ancestral technologies' the key to care for the land and be more sustainable. The T-Labs recorded their learning process in the reconstruction of their Cusmuy (ceremonial house where ancestral wisdom is imparted), that also entailed other pedagogical experiences such as a community living classroom, mingas, mambeaderos, pagamentos (indigenous community practices), meetings with local schools, neighbors and the municipality, to address together the water, biodiversity and sustainability challenges present in their region of San Francisco, Cundinamarca.

The co-researcher in charge was Tatiana Monroy, who is also co-founder of the ecovillage Aldeafeliz, and has lived for 12 years in this intentional community. She has more than 16 years of experience in facilitating groups of different ages in the governance field of Sociocracy, community living and non-violent communication. Tatiana has given workshops and facilitated meetings in many South American countries, as well as in Spain and France.

Box 1. Information about the Central region T-lab and co-researcher Tatiana Monroy, who is also author of the photograph.

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Case study UBUNTU in the Afro community of Las Islas del Rosario, Atlantic coast

Co-researcher: Margarita Zethelius

In the context of the signed Peace Agreement in Colombia, the Caribbean T-lab is a pilot study for a community-based training center for peace called UBUNTU. This center is based in the archipelago islands of Rosario, and is run by community members. It presents a holistic and integral approach to education with practical examples of how to create sustainable solutions in the social, environmental, economic and cultural dimensions of sustainability, inspired by the ecovillage movement. The aim is to help communities in the Caribean region to acquire practical tools and a sense of empowerment so as to recuperate and revitalize their ancestral wisdom, to rebuild trust in their communities, and to co-create their own path to the future they envision, where there is care for people and for their biocultural diversity. The articulation of ancestral wisdom with new technologies and techniques is a crucial component for these T-labs, not just to overcome the challenges of a post-conflict Colombia, but to respond to emerging threats such as climate change.

The co-researcher in charge is Margarita O. Zethelius, a biologist from the Universidad Nacional, Colombia, with a Masters in Conservation and Rural Development from Kent University, England. During the last 15 years, Margarita has been working on projects framed in bio-cultural diversity conservation with grassroot initiatives. She currently lives and works on the Rosario Islands, supporting local empowerment and transformation to sustainability. She is the director of the NGO Alianzas para la Abundancia.

Box 2. Information about the Caribbean T-lab and co-researcher Margarita Zethelius (author of the photograph).

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Case Study Nuh Jay: How does your soul sing?
Various localities of Southern Colombia
Co-researchers: Tania Villarreal and David Coral

The organization Nuh Jay uses a methodology combining art, dancing, and singing, to generate deep encounters between the individual and his or her being. This involves a diagnosis of the relational state of a particular group, and/or connecting a very diverse group of actors with a common purpose. The T-lab consisted in the investigation of the transformational effects of singing and sound on individuals and communities through the encounter with their own voice, the exploration of ancestral dances and the Sufi practices of dances-of-peace to aid the intense search for their own place in the world. The T-labs worked with groups of women, indigenous elders and intentional communities, to show different positions about gender equality, the construction of new roles, the reflection on what is a sustainable world and how the relationships with what surrounds us may help build a culture of peace.

The co-researcher in charge is Tania Villarreal who is a social entrepreneur with experience in environmental education and endogenous research at Escuela Ambiental Panamazonia. She is co-founder of the organization Nuh Jay, together with her colleague David Coral. Nuh Jay have developed the methodology 'voice of one's own soul', as a means of working in transformative processes based on emotional intelligence. Tania is also an Art of Hosting practitioner, mentor in training of the network of Dances of Universal Peace, with experience in community work with ethnic focus, gender and children, youth and adolescents in the departments of Nariño and Putumayo.

Box 3. Information about the South region T-lab and co-researcher Tania Villarreal (author of the photograph).

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Case study of the Coffee Region with the peasant association (ANUC) Filandia, Quindio Co-researcher: Martha Chaves

With the other case studies representing longer-term processes, it was in the interest of the Colombian team to start a case from zero, so as to also research the challenges of the initial stages in a transformational processes. The coffee region T-labs have focussed on the struggle of local inhabitants in the town Filandia, against a mass tourism in the town, after the Peace Agreement in Colombia. Specifically, the T-Labs have followed the learning processes of a group of peasants who want to generate other ways of carrying out tourism without losing their culture, social tissue and their natural resources. This has involved workshops on auto-organization through principles of Sociocracy, and farm diagnostics around a framework of climate change resilience.

The co-researcher in charge is Martha Chaves, who is a biologist with a Master's degree in community-based Forest and Nature Conservation from the University of Wageningen, the Netherlands. Martha also completed her Ph.D. studies at the same University with the Research Group in Sociology of Development and Change, and the Research Group on Education and Learning Sciences. Martha is the Director and co-founder of the organization Transitional Minds. Her interests lie in the fields of transformative learning, community conservation, development studies, and social innovation.

Box 4. Information about the Coffee Region T-lab and co-researcher Martha Chaves (author of the photograph).

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National case study of the Call of the Mountain:
The nexus of our case studies
Lead researcher: Thomas Macintyre

All co-researchers and their organizations are members of the Colombian Network of Sustainable Settlements (CASA Colombia) which brings together initiatives to co-create solutions through an annual gathering named "Llamado de la Montaña" (The Call of the Mountain). This five-day intercultural event brings together a wide range of people, communities and initiatives from all over Colombia and beyond, around shared sustainability challenges. With roots in the ecovillage network, the CASA network has evolved into a broader network of initiatives, seeking to articulate diverse visions and practices of sustainable and regenerative living.

The lead researcher is Thomas Macintyre, co-founder and the main researcher of the organization Transitional Minds, with a master's degree in International Development Studies, and completing a PhD in Education for Sustainability with the Education and Learning Sciences Group at the University of Wageningen, The Netherlands. Thomas' interests are in the fields of rural development, agroecology, transformative learning and storytelling.

Box 5. Information about the National T-lab and co-researcher Thomas Macintyre (author of the photograph).

The decision to work with co-researchers was a significant moment in my doctoral journey. By setting up an experimental research team made up of community members, I was accepting that I was not the expert in the field of community learning, and that I needed the co-researchers to help conduct this research. I was giving up a degree of control and autonomy for my research in the hope that the collective experiences, skills, and diversity of our team would contribute to knowledge and action towards more place-based and relevant transformations. From this point on the co-researchers mentioned above, and myself will be referred to as the Colombian team.

4.3. Team building and collective visions through Dragon Dreaming

An important aspect of any PAR project is establishing a safe participatory environment, and developing a common vision and research question. This helps develop affective bonds, trust and purpose between team members. During the CotM of 2016, participants collectively decided to hold the following year's event in the Indigenous Kankuamo community of Atánquez, in northern Colombia. The Colombian team decided that our first T-Learning workshop

Figure 5. The T-Learning team alongside friends from the community of Atanquez, 2017. From left to right, co-researcher Margarita O. Zethelius; community member Rosa, co-researcher Tania Villareal; co-researcher Tatiana Monroy; co-researcher Martha Chaves, community interpreter Andres, and three Kankuamo children. (Photo credit: Thomas Macintyre).

would take place in this indigenous community with two main objectives: First, to articulate our research with the Kankuamo community, so as to better develop bonds for research leading up to the CotM gathering. The second objective was to use the opportunity for team-building through sharing our personal processes of transformation with one another, as well as developing a shared vision for the Colombian case study.

From the 20th to the 24th of January, 2017, we carried out the workshop, whereby each participant contributed with team building activities and participatory envisioning tools. The scene was set through an initial arts-based exercise of felting life-history experiences with which to share our personal stories with one another (see box 6 below). The logic behind this exercise was to activate senses beyond the cognitive, awakening other inte-

lligences or modes of understanding such as the intuitive and creative. The colors and feel of wool, and the sharing of personal stories between us, felt to me like the beginning of a bond between us on this project we were carrying out together. Moving on from our individual experiences and dreams, co-researcher Tania Villarreal facilitated an exercise using the tools of Dragon Dreaming to collectively envision the goals of our Colombian case study (see box 7 below). We came to the joint decision that we wanted to work towards outscaling the transgressive learning of our local contexts, through creating an educational program connecting community-based pedagogical material, with higher education institutes. Co-researcher Tatiana Monroy then facilitated an exercise in Sociocracy, whereby we created an organisational structure using working 'circles' to allow for distributed leadership (see box 8 below).

Method: Felting life-history experiences.

Each participant felted the five most significant turning points in their lives using different coloured wool. We then video recorded each other explaining these turning points, thus creating life histories of personal transformation. This was an emotional exercise as it brought forth deep moments in our lives which we creatively translated into art, then put into words.[9]

[86]

Box 6. The arts-based method of felting life-history experiences. Atánquez, 2017. Photo credit: Thomas Macintyre

9 | See the following links for the life-history interviews: Martha Chaves (in Spanish): https://youtu.be/gmXd8ee-Vur8; Margarita Zethelius (in Spanish): https://youtu.be/whpZKL_U-d0 Tatiana Monroy (in Spanish): https://youtu. be/Vi_qc2dIunk; Tania Villarreal (in Spanish): https://youtu.be/PYoQl_5C6nI: Thomas Macintyre (in English): https://youtu.be/4VPDxnTKMug

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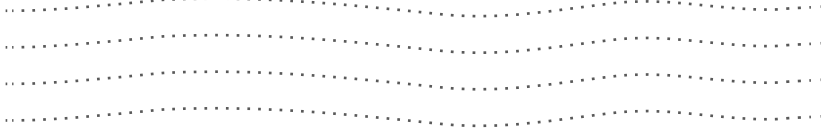
Method: Dragon dreaming

Dragon dreaming is a technique pio-neered by the Gaia Foundation, based on a living systems approach to building successful organizations and projects, integrating personal growth, communi-ty building and service to the earth [87]. Through each person's desire, a com-mon vision is formed and a 'roadmap' to reaching it is created. In our exercise, co-researcher Tania Villareal facilitated the use of a dragon dreaming tool called the 'dream circle', in which we first de-veloped our individual dreams, followed by a process in which our individual dreams had to 'die' in order to be reborn as a collective dream with the question: What does this collective dream need to include in order for me to commit to it? Moving around the circle, everyone then presents their answers to this question. After moving around the circle as many times as necessary for participants to feel satisfied, the final collective dream was then read in the past tense, as if the project had already happened. This is a powerful way to invite the future into the present. Please see the report from the team-building workshop for more details about this process [86].

Box 7. The method of dragon dreaming. The image illustrates the Colombian T-Learning team developing their individual dreams. Atánquez, 2017. Photo credit: Thomas Macintyre

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Method: Sociocracy as a governance and organizing tool

Sociocracy is a system of governance with detailed methods that facilitate social organizations to develop participation and empowerment [86]. The Colombian team employed three concrete sociocracy exercises for organizational design, planning, and determining next steps in our T-Learning project, facilitated by Tatiana Monroy: 1. Collective creation of proposals: A six-step exercise to efficiently identify the important elements of our project and develop them into a proposal. 2. Decision-making by consent: The sociocratic method involves multiple rounds of evaluation and feedback to improve the project. One of the principles is that there is no perfect proposal, with instead a 'good enough for now' approach taken. This process consists of six steps to discuss the proposal, building up to a final, improved version 3. Action Plan and next steps: In sociocracy, it is essential to specify the following steps in the project so as to establish tasks, responsibilities, and delivery dates. In the case of the Colombian team, this was formalized through the organisation of four working circles, which delegated responsibility for different aspects. Please see the report from the team-building workshop for more details about this process [86].

Box 8. The method of Sociocracy. The image illustrates Tatiana Monroy, top right, facilitating the development of the four working circles which made up the organization of T-Learning project, Atánquez, 2017. Photo credit: Thomas Macintyre

I consider the Dragon Dreaming exercise to reach a collective vision, and Sociocracy to organize reaching this vision, as significant moments of my research. Through these innovative tools, we were able to organize ourselves as a group and find a common interest and purpose for our research. Already through this workshop, I was becoming aware of our diverse and sometimes conflicting ideas on transformation. In dragon dreaming terms, our 'dragons' had come out to 'dance', representing our egos interacting with one another in the form of our desire to impose our ideas on one another. In retrospect, I cannot stress enough how important it was to harness the complex, inspirational but also emotional feelings and ideas of diverse people through innovative tools for facilitating and organizing group activities.

4.4. Method Workshop: The T-Lab in the Ecovillage Aldeafeliz

As per the agreement in the team building workshop, each co-researcher would organize and facilitate workshops throughout 2017 in their respective initiatives. The opportunity arose for the Colombian team to meet and participate in one of the workshops taking place in the Ecovillage Aldeafeliz, from the 8th till the 11th of July.[10] Facilitated by co-Tatiana Monroy, this workshop focussed on connecting ancestral technologies with modern social innovation tools, generating cohesion and action around water conservation and bioconstruction with diverse actors in the municipality (see box 1, in section 4.2).

During this workshop, we took the time to discuss the method of the Transformation Labs (T-Labs), which would be used in all the co-researcher contexts. As an important method in the Colombian case study, I had _initially explained_ the T-lab as an experimen-

tal space designed to bring together multiple stakeholders around a common challenge [see 88]. But it was important that we developed a collective definition of what a T-Lab was, so as to bring in our different understandings and values of how to investigate transgressive learning in our respective contexts. Through a dragon dreaming exercise of collaborative definition making, we reflected on what a T-Lab was, developing our own co-defined definitions (see figure 6 below):[11]

> "T-Labs are pedagogical processes of restoration and potentialisation of sociocultural tissues in territories. They are developed in living, diverse and intercultural learning spaces giving new reference points and regenerative tools."[12]

We now had the unique opportunity to collectively participate in the T-Lab of Aldeafeliz, seeing what it was like in practice. Part of this T-Lab involved the hands on experience of rebuilding the ceremonial house of the community called the Cusmuy. This reconstruction symbolized the opening up of a new chapter in the community process of Aldeafeliz, with an improved physical and spiritual structure. With spades in hand, we joined a wide range of volunteers from the municipality and around other regions of Colombia, in digging a ditch around the foundation. With

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10 | The Aldeafeliz T-Lab had a duration of two months, whereby the Colombian team was together for three days during the T-Lab.

11 | See the following blog I co-authored on how to carry out this Dragon Dreaming exercise in co-definition making [14]

12 | Original definition in Spanish: "T-Labs son procesos pedagógicos de restauración o potencialización del tejido sociocultural en los territorios. Se desarrollan en espacios de aprendizaje vivos diversos y interculturales dando nuevos puntos de referencia y herramientas regeneradores."

Figure 6. Collaborative definition-making, T-Lab ecovillage Aldeafeliz, San Francisco, Cundinamarca, Colombia.
Photo credit: Thomas Macintyre

the natural building material Guadua (bamboo), we built up the pillars of the structure, and with song we accompanied the metaphysical rebirth of the Cusmuy and the community of Aldeafeliz (see figure 7 below).

In her report on the T-Lab, co-researcher Tatiana Monroy shared some of the results from the workshop [89]. Tatiana noted how the T-Lab had led to transformative moments in participants in actions such as the shared preparation of food, the daily learning of construction, the spaces of integration. Some of the transformations manifested were in participants learning to talk about their physical and emotional needs, valuing the sacred nature of everyday actions, and meeting a diversity of people and ways of thinking in one place. Referring to the T-Lab definition above, we can see the pedagogical

essence coming out strongly through experiential learning, and new reference points for participants in learning about ancestral customs and regenerative tools of ecological reconstruction, which in terms of climate change, could lead to place-based values which result in a more reflective and caring approach to caring for one's local territory [89].

However, Tatiana Monroy also noted some unintended learning outcomes for the community of Aldeafeliz, which proved to be important themes for our research. The first was the disconnection (and hence disengagement) of some residents of Aldeafeliz to the more spiritual activities taking place in the T-Labs, such as the mambeo (spiritual conversation around the fire), and the pagamento (offering to the spiritual world). The reflec-

Figure 7. Eber de la Rosa, community leader from Las Islas del Rosario
(T-Lab Caribe) participating in T-Lab Aldeafeliz, 2017, San Francisco, Cundinamarca, Colombia.
Photo credit: Thomas Macintyre.

tion was that the T-Lab organizers needed to think more about how to bridge the spiritual essence of the cusmuy reconstruction with the every-day practices of the community, so as to make the spiritual practices part of the community fabric, instead of something foriegn, being only used in workshops.

4.5. Reflections on setting up an action research project

This tension between carrying out spiritual practices in a workshop, and incorporating these practices into daily life, was something I embodied during the T-Labs. One experience in particular has been important in shaping the trajectory of my doctoral journey.

This was learning about my own limitations in understanding the spiritual nature of the values and beliefs held by co-researchers, which is relatively foreign to my worldview. I would like to share a reflexive narrative I wrote about this experience:

"It was a cold morning in the Ecovillage of Aldeafeliz, situated one hour from the Colombian Capital of Bogota. After three days of participatory methodology workshops, with few hours of sleep, I was exhausted. But I was also excited. As part of a Transformation Lab we were conducting with co-researchers, Andres from the initiative Colectivo Talanquera was sharing with us an 'Indigenous technology' of energetic cleansing. In the damp morning dew, sitting on a big stone

overlooking the ecovillage, Andres explained the ancestral practice of rubbing small balls of organic cotton between our fingers, concentrating on imparting our negative energy into the cotton which was then 'planted' into the earth as an offering to Mother Earth. Despite having participated in such rituals before, I was still struggling to move away from the cognitive level of these exercises, to really give myself up to the 'silent knowledge' as Tatiana Monroy from Aldeafeliz calls the connection with the non-rational and emotional world. Put simply, I felt disconnected to this 'umbilical cord' to Mother Earth. As I sat on the stone, feeling cold and tired, I looked around at the co-researchers, all with eyes closed and looks of contentment. Many of them are leaders in their communities, navigating complex community dynamics in the search for social and ecological justice. 'How are they able to connect?' I wondered to myself. 'What have they experienced that I have not?' (appendix 5, pg 196)

The above narrative demonstrates my personal dilemma of how action-researchers like myself can engage in research contexts which we do not understand. It was becoming increasingly clear the important role the co-researchers were having in the project. Yet it has been well documented how demanding an approach action research is for the lead researcher [20]. For my part, the role of lead researcher was requiring an immense amount of time to coordinate activities, and emotional energy to be part of change-based processes. Moreover, I was negotiating the institutional requirements of my doctoral project in terms of knowledge production (publishing articles, for example), while trying to accomodate community interests, which have a more practical approach to learning.

Yet, in hindsight, leading an action research project has been a very rewarding process.

I have been directly involved in change-based processes, and have had the opportunity to forge deep connections with people and territories. Many of the co-researchers are leaders in their communities, and have many years of experience in building community and facilitating workshops. I was learning invaluable skills in how to become part of the communities I was working with.

To sum up the shoots of my Living Spiral, I will break down PAR as I understood and used it at this point of the research process into its three essential components, demonstrating how I set up this project:

. . . .

● The *Participatory* aspect was working together with various grassroots communities in their endeavours to bring about positive change in their contexts, whereby specific attention was given to the relationship to co-researchers in the communities. As my reflections above demonstrate, I was clearly experiencing the uncomfortable feeling of having to decolonize myself from the dominant expert-based institutional logic with which I had arrived.

● The *Action* was structured through the method of T-Labs which were workshops in which transformative spaces were designed through innovative social technology tools combining ancestral and social innovation technologies.

● And this was also *Research*, whereby I was leading a team that was carrying out T-Labs, conducting semi-structured interviews with T-Lab participants, and reflection exercises using the Living Spiral framework, all in an attempt to contribute to expanding the frontiers of knowledge meaningful to society.

. . . .

So finally, the Colombian team now had a clear plan of developing pedagogical material through T-Labs, which we would link to the upcoming CotM gathering in the Atánquez community. If only I had remembered, that at this stage, shoots are vulnerable, with ample space for misunderstandings and other pressures that may kill them off.

Chapter 5: Rot and decay – all things must die to be reborn

"De la espiral hacia el centro, el centro del corazón, soy el tejido,
soy el sueño y la soñadora"

"from the spiral towards the center, the center of the heart, I am the fabric,
I am the dream and the dreamer ..."

(Lyrics from a song sung at CASA network gatherings)
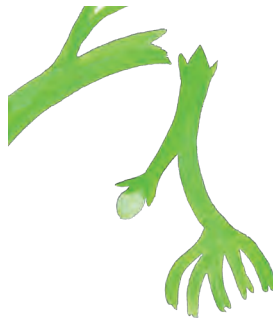
Like any good story, a moment arrives when everything changes.[13] In the Colombian case study, this came through a text message from an Atánquez representative. This message informed the CASA network that the Kankuamo community were cancelling the Call of the Mountain (CotM) gathering due to a breach in protocol on the CASA side.[14] This came as a great blow to all of us. In fact, it was a disaster. Recriminations flew from all sides, and the CotM process was put into disarray. As the Colombian T-learning team, we had planned our regional T-Labs and educational program to feed into the national T-Lab of the CotM event, and now all our carefully laid research plans were like toppled over trees in a storm. However, as such unexpected events tend to do, the chaos brought to the surface underlying tensions and conflicts which had been smoldering within the CASA network we were all part of. As the following sections will detail, this unanticipated change in events was an invitation to take a step back and reevaluate the purpose of the CASA ne-

twork, our objectives in the T-Learning project, and our assumptions about who we are as people and researchers.

5.1. The 'fall' of the Mountain (Barriers)

Let us quickly move back a few years in this story to understand the sources of decay in this process. From humble beginnings in 2006, the CotM was envisioned as an annual gathering of 30 to 60 people making up the ecovillage movement of Colombia. It was a means for members to come together, share experiences, learn from each other, laugh, cry and feel in solidarity in what often feels like lonely experiments in alternative living. With the ecovillage network growing, the decision was made in 2012 to expand the network to non-ecovillage initiatives and projects. That year's event was held in the Ecovillage Atlantida with over 400 participants from a wide range of grassroots communities and initiatives from around the world, all answering the call of how to co-create more sustainable futures together.

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13 | This chapter is based on an article I published in the *Communities Magazine* [90].
14 | A flyer for a CASA workshop to be held in Kankuamo community was advertised without approval and insignia of the local Kankuamo government, in strict violation of protocol.

Since 2012, an increasing effort had been made within the CASA network to connect with diverse ethnic grassroot communities and other social networks and movements. The CotM gathering became the vehicle for this effort, and mushroomed into a large, intercultural event, with the mission of articulating diverse worldviews and sustainable practices across ethnic, social and economic groups in society. The event was held simultaneously in different Colombian bioregions in 2013, in the religious Hare Krishna community Varsana in 2014, and in the Indigenous Misak University in 2015,[15] each event bringing together over 300 participants.

However, there had been a long-term simmering tension in the network concerning the role of CASA and the CotM gathering. Should the network continue expanding and articulating its vision with other sustainability groups as a means to disseminate its sustainability message? Or should it fortify and deepen the relations between its original members and improve their initiatives through smaller, more intimate family gatherings? As mentioned in the previous chapter, during the 2016 CotM, a collective decision was made: The 2017 gathering would be held in the Indigenous community of Atánquez, articulating CASA with the spiritual heartland of the Indigenous tribes of the Sierra Nevada in Northern Colombia. Expansion was chosen over consolidation.

This turned out to be a fateful decision. Alongside the acknowledgement that there had indeed been a breach in protocol on the CASA side, it became equally clear that strong internal, political and cultural factors were at work in the Kankuamo community, which had contributed to their decision to cancel the event. With the CotM process stagnating and souring, Bahamar, the elder of the Ecovillage Anthakarana in the coffee region of Colombia, offered to host the event in his community, rather than having the event cancelled. One of the pillar communities of

CASA, with a strong focus on family values and spirituality, Anthakarana was bringing the CotM back home to its family roots.

5.2. Future search in Anthakarana: the bridge between the visible and invisible

In this section, I provide a narrative account of this tumultuous event from my role as lead researcher of the CotM T-Lab.[16] It comes from a magazine article I published in *Community Magazine*, where I wanted to share the challenges of organizing a networking gathering [90].

"It is December 9, 2017, and together with my wife Martha and 5 year old son Mateo, we are arriving to the ecovillage Anthakara. As members of the organizing team of the network, and co-organisers of the event, it has been a rough year for my wife and I. With a traumatic late change in the hosting community, burnouts amongst organisers, and the personal and political intricacies of working within a group, the CASA network is at a breaking point. Leading up to the event, organising members began dropping out, one by one, and phone calls began streaming in the night before the event from other regular participants: "Sorry, I cannot come, something else has popped up". All the online meetings throughout the year, two hours, three hours, planning agendas, travels to the host community – putting one's nuclear family aside to volunteer time for the network – all that work with the very real prospect of the upcoming event being a fiasco. Driving up to the off-the-beaten-track Anthakarana, pot-holes and stones jarring our 4x4 car, the only flame

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15 | The following is a link to a video made by one of the participants covering the Call of the Mountain, 2015: https://youtu.be/TMIzOBnDqzA

16 | The following is the link to a video made my one of the participants covering the Call of the Mountain, 2017: https://www.youtube.com/watch?v=Z-qyWvMAXp4&feature=youtu.be

keeping us going is the amazing job of the new host community Anthakarana to organise the event at short notice, and a personal sense of responsibility to see the process through.

We park at a nearby football field and start the 10 minute walk down the muddy path to Anthakarana, laden with supplies. Tired, we arrive, and put up our tent. It begins to rain. The rain quickly turns into a downpour, and is soon torrential. Water begins streaming through our borrowed and supposedly waterproof tent. We scramble out and cover our tent with a 7x3 meter plastic sheet I brought 'just in case'. No more rain enters... but perhaps it is too late. While Mateo excitedly jumps on the wet mattress with muddy boots, an embodied sense of fatigue overpowers me. Beyond frustrated and disappointed, I feel angry and fed up. That question many of us ask ourselves is souring dangerously in my stomach: Is it all worth it, being actively part of a network? The answer feels very much like no.

'Papa, I want to see my friend Nawell,' my son Mateo says. Martha and I look at each other. "For Mateo" we silently tell each other, and leave the tent. We arrive at the communal kitchen of Anthakarana, where those who have arrived have gathered. I see their happy faces at seeing us arrive, we exchange hugs and kisses, slaps and knowing looks. I am truly surprised to feel an honest feeling of returning to friends and family after a long time away. These are the people I know and have shared so many experiences with. Where else would I rather be? I would like to have said that all the hard work, the struggles and disappointments, was worth it, seeing them all here. However, I did not have that feeling. Over the evening meal of arepas con queso (maize cakes with cheese), and sopa de platano (plantain soup), catching up with the fellow organisers, I

looked around to see who had arrived. Special invitees? Nobody. Representatives from articulated communities? Nobody. Where was everybody? What had become of our network CASA?

The following morning we were met with drizzling rain. After breakfast served with coffee produced on the neighbouring farm, and brewed with gas from the biodigester in Anthakarana, we made our way down to the buenoka - the ceremonial house of the community. Passing siete cueros plants, with their beautiful purple flowers, children running around in superhero outfits, we walked in procession, led by the the sahumadoras - incense burners - towards the future of CASA.

In the turmoil of organising the Call of the Mountain in Anthakarana, it had become clear that the event would be very different from previous ones. In the midst of the crisis, a methodology called Future Search was put forward [91], in which we would explore the past, present and future of the network CASA and its gatherings. This workshop would be externally facilitated, with the goal of inviting key people from the network, as well as communities in which the Call of the Mountain had previously been held. Although most invited participants did not arrive, a total of 35 people were present, now entering the Buenoka to evaluate the network.

The following grueling three days involved exercises in understanding the community processes we were in, and planning the future of CASA. We explored the past of the network, transformational moments and experiences, what was happening in the present, and our individual and collective visions for the future. In addition to the more cognitive Future Search methodology, the ancestral practice of the Circulo de la palabra (talking circle) around the fire took place

Figure 8. The ceremonial Buenoka during Future Search workshop. Photo credit: Thomas Macintyre

the first night to connect our hearts to the process.

After the three days of intense and emotional work, we finished the future-search workshop. Leaving behind a collective explosion of catharsis, the rain stopped, and the sun came out (literally). It was time to celebrate being together, and that night we sang, danced and revelled in being together. The following days involved the planting of palmas de cera seedlings, the national tree of Colombia, in the territory of Anthakarana. Each participant planted not only the seedling, but also their purpose with the CASA network into the rich organic soil of the Colombian Andes.

I had been an active member of the Call of the Mountain process since 2012, and it had been an enriching experience. Yet as an organiser, the process has taken its toll, and I was no longer feeling fulfilled in my contribution to the network. Something in my rational worldview had shifted. I needed to connect more to who I was as a person and how I was relating to those around me. As I planted the palma de cera into the soil, I decided it was time to step down, stop moving outwards and move back to my origins, dedicating more time to growing bananas and coffee on my farm, being with my family, and investing my energy as a researcher to the transformation processes of my co-researchers and my own context in the coffee region.

After many years of being actively involved in the CASA network and the CotM gathe-

Figure 9. Participant planting a *palma de cera* during the Call of the Mountain event, ecovillage Anthakarana, Quindío, Colombia. Photo credit: Thomas Macintyre

ring, I had taken the difficult decision to take a step back and allow the process to move on without me. The following section will describe what I had learned from this process.

5.3. Transgressive learning findings up until now

A fundamental aspect of this turning point in my research trajectory was beginning to understand the spiralling and messy nature of the transformation process I was part of. There was so much I thought I understood, but which I clearly did not - realities I was only scratching the surface of. To finish off this chapter, and what we can understand as the first part of my research journey, I want to summarise the findings of my research up until this point, paying special attention to research question 3 and 4, which address

the challenges of how to design and facilitate transgressive learning, and the levers and barriers to realizing it. I will use the different learning aspects of the Living Spiral model to present these findings.

Barriers

◎ *Power relations are especially inherent in transgressive research:* As researchers and active members of the intercultural network CASA, we had believed that the network could provide a 'rainbow' umbrella for articulating diverse cultural groups around a shared sustainability message. The reality was that the diverse members of CASA came with a different ways of enacting sustainability, different interests and political agendas, which required special attention to negotiating these power dynamics, or

what we could call ontological politics [80]. It had become an ontological struggle to keep the network and the CotM moving forward, and we had not succeeded.

◎ *Participation is easier said than done:* Despite well developed governance tools such as Sociocracy being used to organize the network, the collective intelligence of our organization had not done enough to take care of its members, resulting in burn-out amongst members, including myself. With T-Labs requiring substantial investment of time and energy from co-researchers in their roles of facilitators and emotional 'containers' of such transformative spaces, we were going to have to think hard about how the 'participatory' element of our research was going to enrich the process, instead of burning it out.

Processes

◎ *The spiralling nature of transgressive processes.* One of the collective learning outcomes of the future search workshop was the spiralling nature of the CotM process. Like our case study until this point, the CotM process had been one of ever expanding cycles. The above disruptions halted this expansion, leaving the process uncertain and in limbo. After the Future Search exercise in Anthakarana, there came an 'aha' moment, the collective realization that expansion cycles are a repetitive and normal movement in nature. But so are contraction cycles; we breathe in, then we breathe out. On the one hand, the *expansion* represents creation and multiplication, which can be seen in the CASA and the CotM expanding, articulating its vision beyond the realm of ecovillage to other sectors of society, going from an event with around 30 participants to an event with over 300 participants. On the other hand, the *contraction* represents

decay and even death, suggesting a return to the point of origin (as the ecovillage song portraits at the beginning of this chapter). Having fulfilled its natural cycle of expansion, some visions and purposes of the CotM started to decay, and the network CASA's process began contracting back to its core family roots, to almost the same 30 ecovillagers who started the process 11 years ago. This experience allowed me to understand more about the nature of transformative processes. I started realizing the same cycles of expansion and contraction in my own transformational processes, giving me the perspective and strength to let go and accept death in my research journey. The spiral symbol had became a collective metaphor to understand the cyclical movement that has been lived in the network process.

Invisible processes

◎ *When the hidden nature of transformation is taken advantage of, it can make things flow.* One way invisible processes are manifested is through the spiritual connection to territory. This connection, which co-researcher Tatiana Monroy refers to as 'silent knowledge,' runs through the network CASA, and is omnipresent during CotM gatherings. This takes the form of rituals such as 'pagamentos' (offerings to Mother Earth), spiritual cleansing to harmonize the group with the territory, dances of peace, *mambeos,*[17] which work with the emotional and spiritual sphere of participants. Invisible processes can manifest themselves as the harmonizing energy and emotional healing felt after each exercise of this kind. A practical manifestation of the invisible occurred during the Future Search exercise in Anthakarana.

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17 | *Mingas* are traditional work parties. The *mambeo* is an indigenous ceremonial conversation around a campfire, where the elder invites the entities of fire and the coca leafs to also engage in the conversation to investigate issues and weave the relational tissue of the community.

After the second day of mostly cognitive work, we were all feeling stressed, tired and emotionally tangled up. A leader from the ecovillage Aldeafeliz proposed a *mambeo* in the ceremonial house to seek the wisdom of other non-human entities, through the channels of the fire, tobacco and coca leaves. By midnight, sitting around the fire in a circle, the energy was completely changed. Conversation was flowing, emotions were lifted and the 'aha' moment of the expansion-contraction nature of our processes was reached. The *mambeo* helped make visible the invisible processes that were keeping us apart.

Passive and active absence

◉ *Include government (political) actors in community processes.* During the CotM gathering in Anthakarana, where we were back to the original family of CASA members, I felt a strong sense of participants 'preaching to the choir.' We shared a similar desire to work towards small-scale, deep, and collective transformations. The contracting spiral was representative of this. But if we were really going to work towards 'transgressing' structures in society, then it was clear that government actors should be involved in this process, and their 'passive' absence until now was a blind-spot in our process. The political role of the fallout with the Kankuamo community had demonstrated the power this sector in society had in promoting community processes, and this might be an aspect that we should be concentrating more on.

◉ *Caring for the core team.* As a research team, and the greater CASA organization, we had excluded the importance of looking after ourselves and one another. This is an example of an 'active' absence where the good of the project and the process was intentionally placed in front of the individual. We were going to have to think better about balancing the energy-consuming 'disruptive' nature of our research, with the need for caring and creating compassion between ourselves and the people we were working with.

Moments

◉ *We cannot control the world around us.* It is hubris - an excessive sense of self-confidence - to think we can grasp what is going on around us. We can plan T-Labs, invite participants, and design a space for joyous intercultural transformations, but the world is made up of more than the sum of its parts, the inexplicable is just around the corner, and at the end of the day, things will happen that are beyond our control. The process described in this chapter made this crystal clear to me.

◉ *All things must die to be reborn.* Taking the decision to take a step back from the CotM process was accepting that a process inside of me was going to have to die for me to move on with my research. This was a tough insight, as I had been part of the process since 2012, and have many memorable experiences and friendships. But is was necessary to move on, to use my creative energy to spark new processes inside and outside of me.

With an increasing understanding of how decay and death are ever-present in a transformational process, and having had a little taste of how invisible processes can manifest, I was ready to move deeper into my research journey and to look for what I was not seeing. As the Colombian team, we reflected that we had set our sights and expectations too high on articulating worldvisions across very different societal groups, and across vast territories, stretching our resources and network ties beyond breaking point. It was time to let go of the grandeur of our vi-

sions, and connect with the essence of what we wanted to achieve in our local T-Labs. We were going to have to explore in deeper detail what our roles were in generating trans-gressive learning that could be generative, instead of destructive towards reaching our personal and collective dreams.

Chapter 6: Stems – acknowledging our role in noticing the invisible

"The range of what we think and do is limited by what we fail to notice. And because we fail to notice that we fail to notice, there is little we can do to change, until we notice that failing to notice shapes our thoughts and deeds." (Ronald Laing) [92]

The stems in the Living Spiral refer to moments in our processes where we encounter and overcome barriers, challenging norms and recognising the invisible or absent in the processes. Here the metaphor of the *boton de oro* can be helpful. The *boton de oro* grows fast as a shrub, but consequently its stems are not strong. They can be broken through wind, heavy rain, or the mild strike of a machete. At a first glance, one may only see a broken plant with a lot of 'garbage' around it. However, the broken stems, leaves and flowers create the opportunity of increasing soil fertility if they are left to decompose. To expand on this metaphor, if we fail to notice this opportunity and remove the green 'garbage' from around the plant, then our soil will become poorer with time. Likewise, the disruptions and decay in any transformational process, such as the one presented in the previous chapter, play an important role as they are a source of improvement if we do not fail to notice and use them. Consequently, it seems critically important that researchers and practitioners develop the qualities to reflect and learn about what one may be failing to notice in relation to the deeper contradiction in the work of transgressive learning.

In this chapter, I present an exercise of tarot cards to delve into the unknown of who we are as researchers, and the analysis of Living Spiral narratives by co-researchers so as to present updated qualities of a transgressive researcher. This culminates in the important methodological innovation in this thesis in the form of 'transgressive action research.' I finish with an uncomfortable encounter with absence in the form of the academic world I had left as I entered the realm of transgression.

6.1. The Tarot of transgression

In the Colombian case study, co-researchers have played important roles as cultural facilitators, bridging the community context of customs and traditions, with the requirements and expectations of an academic project. Like myself in the previous section, co-researchers must navigate ethical and practical dilemmas in their research, such as being intimate members of the initiatives they are researching. Tatiana Monroy, for example, has lived for 12 years in the community of Aldeafeliz and is a co-founder of the

initiative. As a co-researcher, she is expected to be able to 'bracket' [70] her personal beliefs and biases so as to take a critical stance to what she is researching. In a very different context of the afro-Colombian community of Las Islas del Rosario, co-researcher Margarita Zethelius is working towards bringing sustainability design and concepts to a community engaging in an emancipatory process of territory building. Also here, there is a strong need to reflect on the tensions of bringing modern sustainability concepts and practices to a community deeply rooted in a challenging historical and cultural context.

These challenges boil down to the ethical and practical challenges and responsibilities of conducting research, which, having a trans-

formational objective, represents interventions in peoples' lives. As a means to explore our roles as co-researchers in the Colombian case study, we carried out an exercise using a tarot deck of activist-scholar 'characters,' developed by colleagues in the T2S program [93]. We chose this method as it is in itself transgressive, allowing participants, through art and intuition, to dive deep into their own research positions, allowing cognitive and emotional intelligences to surface. Specifically, we used the tarot method to reflect on the qualities of being a researcher in transgressive research, within the context of climate change (see box 9 below).

Method: The Tarot of transgressive research

The Tarot cards of transgressive research is an arts-based method for exploring diverse approaches and roles for transformative researchers. Made up of a deck of transgressive activist-scholar 'characters,' participants explore a range of individual images placed on the ground, electing those images which they connected with, and cutting, pasting, and drawing these images into a collage. Each participant then presents their Tarot card collage back to the group, focussing on their roles as transformative researchers. The power of the Tarot is to act as a key to

unlocking the deeper intuition of the participant, exploring other ways of knowing, through confronting symbols they would not normally consider. [93]

Box 9. Tarot card method with co-researchers, facilitated by Martha Chaves, Filandia, Quindío, Colombia.
Photo credit: Martha Chaves

As a way to understand how the results from this exercise came about, I want to share the tarot card that co-researcher Tatiana Monroy put together (see figure 10 below), where she in her own words explains the capacities needed for being a co-researcher in transgressive learning.

"The first image which I connect with relates to the image of the person at the bottom of the sea - seeing into the profound nature of the investigation. This is the context, not just staying at the superficial level, where other realities are present: The reality outside and the reality inside. This relates to the image of the 'little prince' where I always remember the quote: "It is only with the heart that one can see rightly; what is essential is invisible to the eye."[18] The co-investigator has to have the capacity to see and appreciate different realities, moving beyond the obvious and logical. This can be helped by the next image of the reflected tree where what we see on the outside is also on the inside. The roots of this tree also need to be visualised, such as memories of other lives, the mystery of the profound. It is important to learn that not just the visible, but also the invisible, holds a great significance in the processes of the investigation.

This connects to the image of a woman throwing herself into the emptiness - much of transgressive research is entering new contexts - contexts that are transformative, and transforming the researcher as he or she is investigating. I perceive a woman who is throwing herself into the unknown, but is enjoying the experience, the possibility of being suspended between worlds, which will allow her to see many things, not just with the filter of the researcher with questions, but also being part of the same process.

This brings me to the sweet image of the deer, which I connect to love: the capa-

Figure 10. Tarot collage by co-researcher Tatiana Monroy

city to connect with others, generating empathy and compassion with others. There are many things during the investigation which can be difficult to understand and thus generates tension. There is the need to be able to see with the heart, and understand that processes are exactly that, processes, that require compassion, accepting that there will be experimentation, errors, highs and lows, different logics, ways of thinking and systems to contend with. The next image I connect with is the image of the two serpents, which brings to mind transformation, and that the research I am part of involves cyclical processes. Change is something constant in the research project, people will change as the process itself is transformative; some processes will close, others will open, the researcher has to have the capacity to understand change as part of the research process. Because of this, I see the image of the boy and the bear as the capacity of the researcher to recognise and realise moments when

18 | *The Little Prince* is a book by the French author Antoine de Saint-Exupéry, first published in 1943. The story is philosophical, raising many questions about life and human nature.
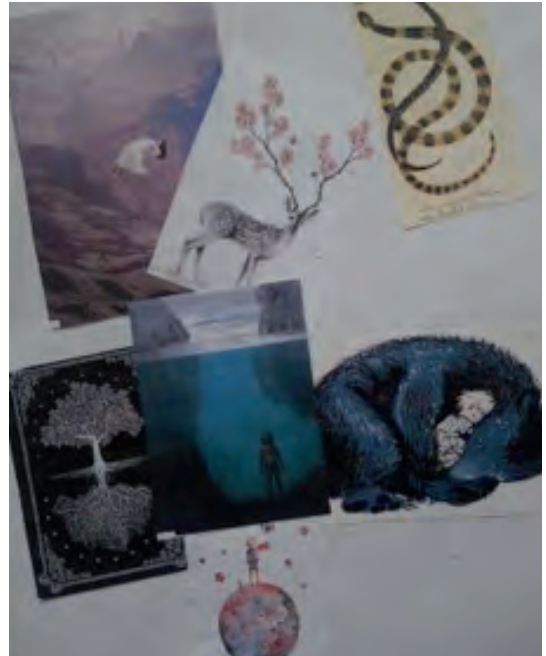
*we need to take care of each other du-
ring research - recognise the need to
take moments of rest, take distance to
process, recharge the batteries: if the
researcher is always intimately involved
the process can be overwhelming. The
researcher must be caring and empathe-
tic to those who are being researched,
but also to themselves."* (Personal Na-
rrative, Tatiana Monroy)

A common theme across all the tarot card
readings was acknowledging the invisible in
the research we were conducting. As Tatiana
writes above, there are clearly characteris-
tics of going beyond the obvious and the logi-
cal, generating empathy and compassion, as
well as the researcher having the *"capacity
to understand change as part of the re-
search process"*. We had thrown ourselves
into the unknown. We now had to figure out
what that meant, and how to take advantage
of this quality in our research.

6.2. Methodological innovation: Towards Transgressive Action Research

This tarot card workshop, alongside reflec-
tions on and from the process we had been
going through as individuals and as a group,
was continuing to raise critical questions to
the PAR methodology, which was guiding
our research. We had been attempting to
carry out 'participatory' research, in that
we were including diverse stakeholders and
were taking up the challenge of decolonizing
ourselves from old paradigms and world-
views which were not contributing to the so-
cio-ecological transformations we were see-
king. But there was something that was not
working, something which just did not make
sense. The action-reflection research cycle
[94], so typical in action research, seemed
too cognitively neat to explain the 'mess' we
felt ourselves to be in. Sharing these concerns

with my daily supervisor Valentina Tassone,
she wondered why I did not explore what a
form of *transgressive* action research might
look like.

Building on the previous theoretical work on
the Living Spiral model, I returned to the lite-
rature on PAR. First, it was interesting to note
how the concept of 'participation' emerged
as a form of radical social transformation in
the face of neoliberalist capitalism. However,
it has been argued that the concept has been
co-opted by institutions deeply entrenched
in the status quo, resulting in the word be-
coming a buzzword used when working with
different actors, but of whose deeper philo-
sophical meaning has been diluted [95]. So
as to be a counter-hegemonic methodology
of and for the margins of society, Jordan [96]
suggests PAR practitioners draw on other
critical methodologies thus forging alliances
with other research communities.

Taking up this challenge, I began to draw
together the two strands of PAR and trans-
gressive learning, putting forward the con-
cept of Transgressive Action Research (TAR)
in a paper I wrote with the co-researchers
(appendix 3). We argue that the deeper me-
aning of transgression - both to go against
and to move beyond - implies exploring the
less certain, changing and intangible forms
of knowledge and power relations, as well as
how disruptions caused by the encounters of
difference have the potential to change the
way we understand and shape the world
around us [80]. The concept of transgression
adds to action research the quality of moving
towards the boundaries of what is common-
ly accepted and understood, being open to
the unexplainable and unknown. We can
thereby define TAR as *"a shared commit-
ment to fundamentally disrupting con-
ventional onto-epistemologies through
action-based research, decolonising our
ways of engaging with the world through
embodied experiences of encountering
the unknown and unknowable"* [13].

In TAR, knowledge is generated through embodied reflections by researchers, based on day-to-day practices, with a special emphasis on the researcher being critically aware of their dual roles as a community member and researcher. Similar to PAR, the TAR approach involves rounds of reflection and action by researchers. However, rather than being an orderly, cyclical process of action and reflection, TAR involves a spiralling process of learning-based change, which recognises that we are simultaneously researching transformation while undergoing transformation ourselves (see table 3 below for a comparison of PAR and TAR).

As has been represented in earlier transformative research [97], the spiral metaphor captures the reflexive learning journey of the researcher, where TAR emphasises the need to move beyond boundaries, opening up to the inexplicable and unknown. In the same way that I had embodied these boun-dary-edging moments in the CotM gathering in chapter 5, a defining aspect of TAR is that one has to live the transformation to understand it. This involves exploring how to 'transgress' comfortable, normalised paradigms of how we understand the world, acknowledging the hidden nature of much knowledge.

After understanding the potential of this methodological innovation to better understand our transformational processes, the co-researchers and I were ready to dive into connecting our own transformational processes with that of the processes of the regional T-labs we were researching. We decided to use the Living Spiral framework as a guiding tool to address this reflection.

	Participatory Action Research	Transgressive Action Research
A key focus	A praxis-inspired commitment whereby the researcher goes through a process of decolonization from the dominant expert-based institutional logic, and instead assists intellectual and political movements for people's self-reliance and empowerment (e.g. [17])	A crisis-inspired existential shared commitment to fundamentally disrupting conventional hierarchies in order to facilitate knowledge production through action-based research, decolonizing our ways of engaging with the world through embodied experiences of encountering the unknown and unknowable.
A key process	A cyclical iterative journey of reflection and action by the (co-)researchers, which engages them in understanding why things are the way they are (current state), what keeps things from changing (maladaptive resilience), and how things should be (more desirable state, also referred to as phronesis [98]	A spiralling process of learning-based change, which recognises that we are simultaneously researching transformation while undergoing transformation ourselves. Through reflection cycles we never end up at the same place as where we started, and there will also be invisible processes and absences that are often unexplainable/unknowable.
A key limitation	Because of its focus on participation, there is a danger that underlying tensions and paradoxes are not addressed in the research collaboration between lead researcher, co-researchers, and research subjects. (e.g. [95]	Because of its focus on research tensions and paradoxes, it is difficult to justify this approach in traditional learning contexts which focus on measurable indicators and clear results for evaluation purposes.

Table 3. Key characteristics for Participatory Action Research (PAR) and Transgressive Action Research (TAR). Taken from Macintyre et al. [13]

6.3. Living Spiral narratives from Co-researchers

Each co-researcher therefore carried out the steps of the Living Spiral framework (see section 2.3), writing up a narrative with accompanying Living Spiral representation, describing the transformative process of their T-Lab with specific references to experiences which happened during the T-Labs, and the connection between these experiences and climate change. In analysing these narratives, we were interested in continuing the exploration of the transgressive learning qualities needed to respond to climate change (research question 2). Through carrying out a thematic analysis [99] of the co-researcher narratives, we developed a list of co-researcher qualities for TAR (see table 4 opposite). Discussing these results, we came to the conclusion that the transgressive researcher requires the fundamental quality of being able to transcend dualities, for example, letting go while resisting, being strong while being tender, and doing things from the heart while being systematic [13].

I want to finish this section by giving voice to the above qualities to co-researcher Margarita Zethelius, who works with an afro-Colombian community in the *Islas del Rosario*, off the coast of Cartagena. The following is part of her personal Living Spiral narrative, alongside her drawing, which shows the operationalization of some of the above researcher qualities into the design and facilitation of transgressive learning in educational spaces (research question 4).

"I chose the tree as my spiral representation — a tree from the Colombian Andes where I was born. Sustaining this tree is life-giving water and the relationship with my mother. At the bottom of the picture is also a drawing of a Temazcal [indigenous sweat lodge], *which for me has been a way of connecting more profoundly with who I am; not only where I come from, but uniting me with diffe-*

Being empathic	Connecting with a place, with oneself, with others, being emphatic
Letting go	Allowing for transformation, letting things die, accepting things as they are, moving away from fixed ideas
Being open	Being receptive, flexible, actively listening
being dialogic	Being inclusive, generating dialogues, translation between culrures
being analytical	Documenting information, thinking systematically
Resisting	Rejecting ideas, withstanding adversity, handling a struggle, copying with frustration, strength of character

Table 4. Qualities of co-researchers in Transgressive Action Research. Taken from Macintyre et al. [13]

rent places and people around the world in a matrix — what some people call Mother Earth.

Having worked many years with grassroots communities and sustainability networks, always wanting to change the world, one of the qualities I believe important for a co-researcher is to be flexible, accepting that there is no perfect model, and to see everything that happens is an opportunity for growth, an opportunity for analysis. If as a researcher one does not have the ability to be flexible, to respond to an invitation to see things in a different way, then it is very difficult to move past one's own mental barriers. This appreciates that perfection is not necessary. Things can

Figure 11. Living spiral representation by Margarita Zethelius.

be good enough for now, accepting that we learn in different levels and dimensions. Nothing is completely objective, everything is subjective, everything depends on the moment that is changing. It is important to see change without being afraid, to have the confidence to know that you are doing things from the heart — that one is part of something greater than oneself.

One of the ways I incorporate this quality into my research is flexible agenda making. For example, in the first T-Lab in Las Islas del Rosario, there were many people with different backgrounds present. The agenda was not permanent, with each activity being written on a piece of paper which could be moved to a different time slot. This may seem like a simple tool, but it prevents agendas from being too fixed, with a design that allows content to respond to a constantly changing context, and where the process itself can suggest a change in perspective. For example, one of the methods planned was a pagamento (offering to Mother Earth), which is usually held in the morning. However, the elder Mamo Juan said it should take place in the evening (when it is dark), so we decided to light a flame which remained lit for the whole workshop. This contributed to an unintended sense of continuity during the workshop.

Working with people of different bac-kgrounds and educational levels, I also feel that the ability to listen actively is important. This means not just listening from the intellect, where the concept is coming from, but also try to listen to the reality of that person, practising empa-thy, without pretending to understand their world. I have given many works-hops and shared so many stories that so-metimes I assume that people know what I know. During the second T-Lab I faci-litated, we were working with members of communities from around the Carib-bean, and I was using the word 'holis-tic' to describe the approach the Global Ecovillage Network uses to understand sustainability. Realising that there were participants who did not understand what the word 'holistic' meant, I deci-ded to stop the presentation. I asked everyone to come together in a circle, hold hands, and then asked what people felt. This activity was simple, but very powerful, and was a different way of learning together, understanding what 'holistic' meant in a more experiential way." Narrative by Margarita Zethelius [13].

This narrative by Margarita shows how the reflection of co-researcher qualities are en-acted in practice, providing a living, experien-tial glimpse into how transgressive learning environments are being designed and facili-tated.

6.4. Healing concrete and an uncomfortable encounter with academic absence

While Margarita was facilitating a place-ba-sed T-Lab in Las Islas del Rosario, I was about to peek my head out of the rabbit hole of my research context by presenting trans-gressive learning at an international confe-rence on the theme of Inclusive Sustainable

Development.[19] Attracted by the subtitle: How to engage academy, government, communi-ties and business, I attended the conference in Bogota, Colombia, submitting a research paper [see 100] and holding a presentation titled Towards Transgressive Learning in Bio-regional Transition Labs in Colombia.

It seemed like a long time since I had been around other academics from outside my field of study. I was looking forward to sharing what I was doing, and learning something new. Yet I quickly found myself marooned outside of my comfort zone. Having arrived from the norms of ceremonies around the campfire, collective chores in community, and participatory facilitation, I found myself 'participating' in a very conventional con-gress. I sat through presentation after pre-sentation, feeling like I was back at university: powerpoint presentations, rigid agendas, and complicated academic concepts with little time for discussion.

The climax of this conference for me oc-curred when I found myself attending a presentation on 'sustainable construction.' Eco-construction had been a topic in all the T-Labs in my research, connecting modern practices (such as recycling plastic bottles as bricks) to ancestral techniques and world-views, as described in section 4.4. I was inte-rested to see what the connection between sustainability and development would be at the conference. To my surprise, the presen-tation was given by a representative of Ar-gos, a multinational cement producer, and co-sponsor of the congress. I was fascinated to hear the language being used by the pre-senter. There was 'green' concrete, and 'hea-ling' concrete, whereby additives were mixed into the cement so that when the cement cracks it naturally reseals, preventing water entering and further damaging the cement. Increasing the longevity of cement undoub-tedly seemed like an important innovation in constructing with cement.

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19 | See the following link for more information on this congress: http://isdrs.org/conferences/23rd-annual-isdrs-conference-bo-gota-colombia-14th-17th-of-june-2017/

But there was a strong tension inside of me. On one side was an academic and corporate 'world' where multinational companies were uncritically sponsoring a congress on sustainable development, and putting forward a form of concrete as a sustainable construction material, when it has been shown the immense carbon footprint of cement production in the world [101]. In an attempt to create a disruptive moment of group reflection, I raised this concern at the end of the presentation, but, after an awkward moment, the presenter reiterated the argument that 'healing concrete' would have a longer life expectancy, and was thus more sustainable. From the assumption that we need a lot of concrete to develop as a society, the presenter's argument was solid.

Yet my own contribution to the sustainable development debate was to present a critical voice as to how a more radical, learning-based change approach, based on encounters with other forms of knowledge and practices, could lead to sustainable socio-ecological outcomes. I had just been in a T-Lab where ancestral building techniques were not only demonstrating how to construct with natural materials (without concrete), but also how these techniques build relations with one's community and territory, hopefully leading to a transformation in the participants' connection with the environment. The few people who attended my early-morning time-slot listened respectfully, asked about the roots of the concept transgressive learning (in itself a rather complicated concept), and then time was up. Next presentation. My moment was over. I returned to my seat and felt myself floundering, wondering what I was doing at this congress.

Reflecting on this feeling, I began to critically assess my own research assumptions. Despite my academic rhetoric of criticising the decontextualized silos of traditional research – and glorifying boundary crossing transgressive research – I was clearly living and working in the same silo I was criticizing. It was a fascinating silo, full of transformational spirit and action, but it was clearly disconnected from this type of more mainstream academia. I was beginning to notice what I had been failing to notice - the passive absences, or blind-spots, in my research. I needed to find new ways to collaborate with other academics and practitioners who were working in different areas, and to constructively critique the research I was conducting. I needed the leaves to grow out of the stems of my research and somehow address this passive absence.

The leaves of the botón de oro are light green, and made up of between three and five curved diamond sections. The primary function of leaves is to feed the plant through photosynthesis: a plant full of healthy leaves will grow, expanding through the collaboration of all its parts. Likewise in this story, as the Colombian team we were starting to comprehend T-learning together, whereby our understandings were not as separated as before, but sharing leaves on the same plant.

In this section, we will explore the findings that resulted from several collaborative processes such as writing a transdisciplinary paper, the Living Aulas Research School, and the outcomes of a cross-analysis, using the Living Spiral model, of critical learning moments which occurred during the T-Labs in the Colombian case study.

7.1. Inviting absence into to my research: A transdisciplinary paper

It is one thing to acknowledge an active or passive absence in one's research and determine how this influences the process. It is quite another thing to go beyond just identifying the absence, and actually addressing it by actively including absent actors and perspectives into a research project. One way I addressed this challenge was by joining a group discussion with participants in the field of corporate sustainability during the Sustainable Development conference. I saw an opportunity to work with people facing challenges different from my own. I listened attentively to discussions on sustainable development and shared my work on transgressive learning. As a group, we found a common interest in our concerns about the lack of research into the challenges of carrying out

transdisciplinary research in-the-field,[20] with regards to the agenda 2030 Sustainable Development Goals (SDG) goals, put forward by the United Nations.[21] "*We should write a collaborative paper on transdisciplinary research,*" one of the participants suggested. So I left the conference with my name on an email list, not knowing where that process would lead me.

To my pleasant surprise, the process continued beyond the conference, and four of us began to meet monthly through video conference to discuss ideas. Although we were working in different research contexts, we discovered that we were all being guided by participant action research (PAR), and hence conducting research with non-academic stakeholders. We also shared a desire to experiment with the way we would write the manuscript together, acknowledging that an important part of learning is the dialogical approach of creating conversation between different points of view [104]. Rather than the single, authoritarian voice which is the norm in academic writing (even when there are multiple authors), we decided to employ an innovative dialogical approach to highlight the multi-stranded perspectives needed for addressing sustainability challenges. This involved each author sharing an anecdote from their research, and answering two generative questions concerning transdisciplinary research.[22] Co-authors then answered these questions, weaving in theory and practices through narratives reflecting on the replies given by the previous co-author. This created a collaborative writing process, facilitated by monthly video conferences where we discussed points of interest.

By exploring the tensions of conducting transdisciplinary research in our respective research arenas (businesses and grassroot initiatives), we were surprised to see common challenges arising in the different contexts of Colombia, the Netherlands and Norway. An interesting result of this exploration was the theme of disruptive tensions and paradoxes inherent in transdisciplinary research, and their possibility to generate reflexive practices in sustainability. In the following paragraphs, I will present two of the main paradoxes we all shared and wrote about together (see appendix 5), and how I experienced them in my own research.

Participatory research risks replicating unsustainable structures

An underlying assumption of participatory research is that every participant can contribute with their own form of knowledge. In this way, outcomes can capture common understandings and representative translations that result in co-production processes relevant to both academic and non-academic partners. This supposedly breaks with unsustainable structures in society which demand clear, authoritative linear solutions to definable problems. Yet in action research-based dissertations, such as this one, one has to deal with reconciling the participatory nature of the research process, and the individual nature of writing up the dissertation. As described in section 4.5, my early fieldwork experiences of trying to connect with the spiritual practices in the ecovillage Aldeafeliz left me confused and overwhelmed, with the feeling that there was so much I did not understand. By focussing on writing up predominantly what we understand in research, for example, in the form of authoritative journal articles, we further the belief that we are in control of what we are researching, minimising what is left unanswered. I have addressed this paradox through sharing my beliefs and doubts in my dissertation, recognising that being participatory means critica-

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20 | Transdisciplinarity is a "reflexive, integrative, method-driven scientific principle aiming at the solution or transition of societal problems and concurrently of related scientific problems by differentiating and integrating knowledge from various scientific and societal bodies of knowledge [102].
21 | This is an ambitious global agenda aiming to address global sustainability challenges. [103]
22 | Generative questions: (1) How do underlying assumptions involved in TD research affect the research process? (2) How can TD research lead to enhanced sustainability outcomes in the context of the 2030 agenda?

lly assessing one's own worldviews, and sharing these reflections between stakeholders so as to be generative of new understandings between people with different worldviews.

2 Is research scientifically valid when it is not replicable? The blind alley of contextual relevance

Place-based research involves practice-related challenges in specific contexts. In action research, this means research interventions which have a meaningful outcome for the community. At the same time, however, the research aspect demands scientific validity involving robust methodologies and fluent dialogue with existing literature. Along with the co-authors in this paper, I had found it challenging to reconcile the theory of PAR to the contradictions taking place in practice. How could I explain the PAR methodology for other researchers so they could understand what I was doing, if it was not making sense to me? What was happening in my research was so contextual I struggled to understand how results could be extrapolated to other contexts? This paradox ended up being generative through the co-creation of the transgressive action research (TAR) methodology, where part of the research philosophy is that processes are emergent, cannot always be understood, and demand continuous reflexion by the researcher. This characteristic of TAR is common for all transformative contexts, but can only be made sense of in place-based research.

The process of writing this paper together began to open my eyes to the collaborative challenges facing all researchers who engage with transdisciplinary research. That my challenges were being shared by researchers in corporate sustainability, from the perspective of academic-business collaborations, suggested that I was touching on a research pattern which crossed disciplinary boundaries.

7.2. Hosting T-learning spaces for transgressive researchers: The Living Aulas Research School

There is no end to the stories about the lonely and confusing road of a doctoral student. Long hours working on a project few people around you understand, and the bureaucratic hurdles of negotiating institutional requirements. In addition, a TAR project means being open and flexible to changing relations and circumstances while working with different stakeholders. In the words of Herr and Anderson, action research approach is like 'designing the plane while flying it ' [20]. I would not disagree.

Luckily, I was part of a Transformative Knowledge Network,[23] striving to be reflexive about the challenges involved in transformational research. As a means for bringing together the different early-career researchers from the three T2S projects,[24] I took the lead together with T2S members to organise a gathering which we called the *Living Aula Research School.* This was held in the coffee region of Colombia in June, 2018, with 20 participants from around the world.[25] The theme of the research school was how to promote a research culture which values and supports deep, 'learning what is not yet there' [38], as well as how to incorporate different ways of knowing, being and doing into research theory, praxis, and the gathering itself. For this, we co-created T-learning spaces where we shared transgressive methodologies that we were using in our own research. For example, we used the Living Spiral framework to present our research to one another by identifying the learning stages of the model in each of our processes,
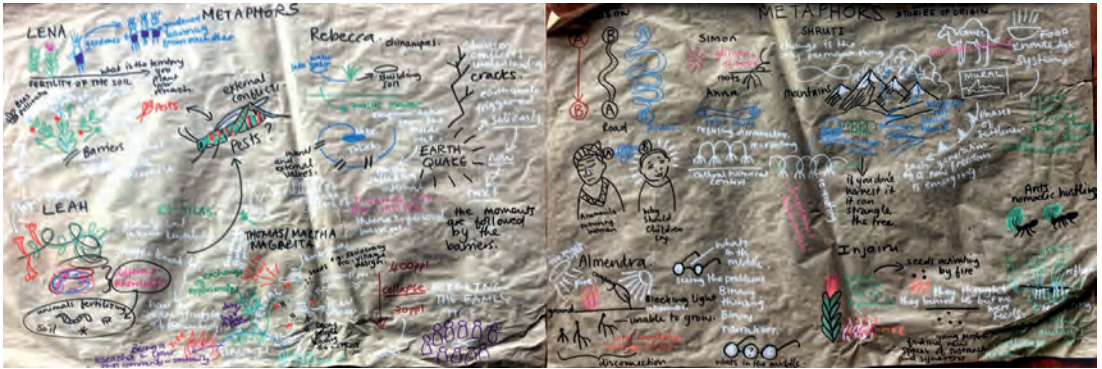
Figure 12. Metaphors resulting from workshop on the Living Spiral model. Photo credit: Thomas Macintyre

and by representing these processes through metaphors. (see figure 12 above).

Amongst the many other activities carried out, I was particularly struck by a workshop given by South Africans Injairu Kulundu and Anna James, who facilitated a discussion on language diversity and power. Translating the sentence *'research worthy of our longing,'* we realised that between us there were 12 different languages present,[26] and that the above translated sentence carried different interpretations and meanings depending on the language context. For example, Spanish speakers decided the Spanish word for research - *investigación* - was too technical a word for how they understood their research. They decided the word *escarbando* (digging) would more appropriately describe the approach to transformative research that makes its way through complex relationships towards a result that is not defined *a priori*.

This workshop rekindled in me the importance of power relations in transformative research. Conversing on the multiple meanings and interpretations between languages, it was a reminder of the different ways of knowing, being and doing in the world, as well as an important counter-hegemonic notion, given the fact that only a few languages dominate the 'sustainability space' in terms of decision-making, policy, research and communication about particular issues [105].[27] Listening to the decolonial stories from around the world from the other participants, it was a reaffirmation that I needed to continue exploring ways of transgressing barriers in how to represent research, focussing on plurality to help change points of reference and critically look at my own cultural assumptions.

The research school also reaffirmed the importance of experiential activities in transformative learning. Leaving the comfortable space of the ecohotel where we were staying, we visited a local peasant permacultural farm, where we were guided around the overflowing lushness of leaves and fruit making up a family project of food sovereignty. With the overarching theme of transformations to sustainability, I personally felt it was a powerful experience to walk and eat what this can look like in practice. A realization after this visit was that the most powerful language to promote transformation is the experiential memory of an achievable transformation (see figure 13 below).

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26 | The 12 languages: Dinka, English, Spanish, Chichewa, Swahili, Hindi, isiXhosa, isiZulu, Afrikaans, Norwegian, German, French.

27 | In an attempt to address these power imbalances, the Living Spiral guide [66] is written in both in English and in Spanish, making it accessible to both audiences.

Figure 13. Marco Hincapie from the permacultural farm *La Pequena Granja de Mamálulú* (far right) explaining permacultural principles to participants. Photo credit: Thomas Macintyre

Another of these moments of moving beyond theory and towards practice came about during the 'Marcha Carnaval'. The research school coincided with a carnival march against mega-mining in the neighbouring city of Armenia. In an organized, peaceful and colorful way, thousands of people took to the streets to protest against the destructive activity of mega-mining that transforms territories. It was a reminder that trans-formation can also be negative, with me-gamining a powerful transformational tool towards a very different notion of what we were understanding sustainability to be. With a shared feeling of struggle in our different countries against un-sustainable hegemonic powers acting as a barrier to sustainability, the act of joining the march demonstrated the important role of the researcher as an activist (see figure 14 below).

Figure 14. Living Aulas Participants in the march against megamining, Armenia, Quindío. Photo credit: Andres Liévano García

Finally, the research school demonstrated the important contributions of co-researchers in our Colombian case study. Apart from contributing their knowledge and skills during the research school and the following T-Learning conference, with tools such as sociocracy (see box 8, section 4.3), they also shared ancestral ways of learning and generating transformation used in the T-Labs such as the *temascal, chicha circle* and *mambeo*[28] with the T-Learning participants. As research school participants Almendra

28 | The *temascal* is a sweat lodge practice of the North American Indians, that recreates the earth's womb to help participants connect to the land. The *chicha* is a fermented maize drink used by several indigenous groups of South America, used to 'sweeten the word' in circles of decision-making or conflict resolution, encouraging non-violent communication, and finding wisdom to resolve issues peacefully. The *mambeo* is an indigenous ceremonial conversation around a campfire, where the elder invites the entities of fire and the coca leafs to engage in a conversation to investigate issues of importance and weave the relational tissue of the community together.

Cremaschi and Rebbeca Shelton expressed it: "*Throughout the Living Aulas* [Research School], *we were also invited, through local culture, practice, and the generosity of the Colombian team, to connect with the beautiful place of Colombia and with each other through ancestral rituals. These rituals were not meant to be cultural or novel experiences, but were used to generate spaces of reflection and collective decision making, as they were originally intended by those who created them centuries ago (and who still use them today). This was a way of embodying the dialogue between different kinds of knowledges, turning to local rituals to reflect on academic knowledges and take decisions related to our future as a network.*" [106]. These experiences built upon a germinating idea in

the network to establish a 'pluriversity' - an educational program based on plurality of forms of knowing and learning, and plans of writing up an academic paper on the learning outcomes of the school.[29]

We finished the Living Aulas Research School with the *1st International Congress of T-Learning in Times of Climate Change.* The congress took place the 9th and 10th of June, 2018, at the University of Quindío.

During the congress we presented research school findings, and also used this very formal academic setting to experiment with creating T-learning spaces. This involved a balanced agenda between normal academic setting, such as powerpoint presentations in an auditorium, and transgressive spaces, such as workshops on social sculpture, and sociocracy (see figure 15 below).[30]

Figure 15. Workshop on social sculpture, given by Dr Dylan McGarry of the South African case study. Photo credit: Yuluka Boavida

An important transgressive experience was the opening ceremony of the congress, presided by the elder Bahamar from the ecovillage Anthakarana (see chapter 5), who together with his partner Deyanira, gave an offering to Mother Earth. This ceremony was a powerful way of setting the tone for the conference, weaving in an invisible, spiritual connection between Man and nature into the forms of research and knowledge which were being presented in the conference (see figure 16 below).

Another transgression to the norm was the diversity of participants. We invited not only academics, but also non-academic actors of the region such as peasants participating in the T-lab of the coffee region, the afro-community leader of the T-lab from the caribbean and other CASA network members. Although the peasants of our coffee region T-lab were engaged in the project through participation in organizational workshops and farm diagnostics, I had been unsure as to the extent that they were really interested in the more conceptual side of the project. To my surprise and delight, four of them made the effort to leave their farms and actively participate in the conference at the university. They afterwards shared their experiences with me, saying that they liked the interactive nature of the conference which allowed them to actually contribute their knowledge to the workshops. This made me feel we had helped bridge a prominent divide between the worlds of the peasants and academia.

The combination of all these academic and experiential activities during the Living Aulas research school and after, led to a strong bond between the participants, and an evaluation of the research school showed that it was considered a transformative space to learn together in a safe way, while also pushing participants to question their roles and practices in transformative research [105].

Figure 16. Members of the ecovillage Anthakarana hold a ceremony to initiate the T-Learning congress.
Photo credit: Yuluka Boavida

7.3. Empirical research on transgressive learning using the Living Spiral model

After these experiences, my researcher mind was ready to dive back into analysing the nature of transgressive learning. One of the most important aspects of learning towards sustainability is to motivate individuals to act on the belief that they can transform themselves and the world around them. However, a constant theme in this story has been the difficult task of bridging the difference between what we believe to be sustainable, and our everyday actions. It is really quite surprising the extent of this knowledge-action gap, considering the ample scientific evidence pointing to the negative impacts of Man on the environment. Ironically, we are documenting our own path to extinction, highlighting not only the limits of science to change our unsustainable behaviour, but also our rational minds to translate this knowledge into action.

As Dahl et al. [107] argue, motivation and commitment to change are rooted at the deeper level of emotions and values. This is in line with the contention of this research that fundamental transformations in beliefs and values are needed for individuals and society to move towards more regenerative futures. A challenge, however, is how to assess the more intangible aspects of values. We have addressed this through the contention that the *process* of transformation is as important as the outcomes.

To explore the values of transgressive learning, we carried out semi-structured interviews during our T-Labs, framed in a critical event narrative inquiry [109,110] (see box 10 opposite). We invited the T-learning case from the Netherlands to join in this endeavour to provide an outsider initiative that could help us minimize context specific findings. This urban community initiative called *Lekker Nassuh*, is based in the Hague, and focuses on sustainability around local food connecting citizens with producers, while creating a communal space in the middle of the city to cook together, exchange second-hand goods, and carry out workshops. Alongside Lekker Nassuh was the Caribbean T-lab, Aldeafeliz T-lab, and the Call of the Mountain T-lab, all with a shared focus on community organization and action-based change.

Method: Critical event narrative inquiry

Narrative inquiry is set in human stories of experience, and provides a framework for understanding how individuals find meaning in their practices. A means for the researcher to generate these stories is through eliciting individuals to share critical event experiences, providing concrete answers on abstract and complex issues of transformation. This involves semi-structured, face-to-face interviews with individuals on critical events that have changed their perspective on a certain theme, such as in the field of quality in higher education [110]. In this research, we used this method in the form of interviewing T-Lab participants and facilitators about critical moments during the T-Labs, which were transformative for them. We defined transformative learning in these interviews as a change in reference points, and world-visions (see appendix 6 pg 227 for interview questions). Considering the importance of context in transformative learning [108], the interviews were carried in situ at the end of each T-lab, supporting a situated practice by the participants.

Box 10. Explanation of critical event narrative inquiry method

The aim was to elicit significant learning moments by facilitators and participants during the semi-structured interviews, and to then place them in the different learning stages of the Living Spiral model through a deductive

analysis. The second analytical step was to carry out thematic coding on the quotes of each learning stage [99], where we inductively identified the values most prevalent in each of the learning stages. Table 5 below presents the full list of the value themes which emerged in the T-Labs.

I will now present a summarized results section of the most prevalent value-based 'signs' of transgression in the learning stages/elements of the four different T-Lab contexts. For more details and participant quotes, see Annex 6.

Value theme	Characteristic	Sources/References
Acknowledging uncertainty	Disrupting the status quo of what is normally understood and accepted, for example, through acknowledging and adapting to what we do not understand, often by acceptance and letting go.	16/41
Collaboration	Forms of working together, for example, through social technologies.	10/12
Communication	The way we interact with one another, for example, through sharing or exchanging information.	5/5
Community	Being part of a group with common characteristics, for example, through valuing the greater good of that group over the individual.	14/30
Diversity	Different people, ideas and perspectives, for example, a focus on multiplicity alongside inclusivity.	10/20
Education	Means of facilitating our understanding of the world we live in, for example, through reflection and learning.	12/21
Optimism	A sense of the possibilities we have as individuals and as a society, for example, through inspiration, compassion, and appreciation.	10/17

Value theme	Characteristic	Sources/References
Order	Planning and design, for example, to ensure safety or to reach goals.	13/27
Practice	Hands-on experiential learning, for example through experiencing novelties and local development.	13/28
Relationality	An understanding of how everything is connected and re-lated to on another, for example, typical in ancestral knowledge and spirituality.	12/39
Responsibility	An understanding and willingness that one can change the world around us, for example, through commitment and leadership	12/39

Table 5. Values derived from thematic coding, with their respective characteristics. Each interview refers to one source, and each reference corresponds to a coded segment of an interview, i.e. the first value of acknowledging uncertainty was coded in 16 interviews (sources), a total of 41 times (references).

Roots are important because they ground a person in the present, alleviating the stress of disconnection in an increasingly complex world. The dominant values which emerged in this learning stage were that of 'community' and 'diversity.' This learning stage shows the importance of reflexivity amongst diversity, of belonging to a community, of finding a place in the world, and the feeling of working for a greater good over the individual, providing a foundation for transgressive learning to take place.

Shoots move out of the soil, manifesting small actions and do-able changes. The dominant thematic values which emerged in this learning stage was 'practice.' This sentiment of carrying out actions together and embodying transformation acted as 'germ cells' [64] emergent in our processes, as they provided motivation for other participants to partake in transformational processes.

Stems develop if the previous germ cells are able to challenge and overcome the structural barriers to their realisation. The following are the learning *aspects* and the most frequent value themes that resulted:

Barriers occur when subjects mention dominant paradigms and ideas which they consider as obstacles in their transformational processes. The dominant value themes emerging were 'acknowledging uncertainty,' where a strong sign was the disruption taking place in the T-Labs. This motivated the opening of one's mind, and changing points of reference on the best ways to do things. The results show that barriers are a natural part of all learning stages, kept alive by societal norms which attempt to keep society

stable and ultimately to survive in an uncertain world. Finding 'order' was another strong theme in addressing these barriers, and ironically, in a transformative context, this meant valuing disruption and uncertain situations where new forms of order could be experimented with.

Processes highlight that transformative learning is a continuous and oftentimes disruptive process, rather than a linear notion of development. The 'invisible' aspects of processes are the tangible but invisible threads which connect learning stages together that require different perspectives and innovative thinking to recognise and understand them. In terms of invisible processes, several T-lab participants noted that these mysterious processes cannot be explained but are an important part for deepening transformational processes. Learning how to address and value uncertainty through noticing invisible processes was a dominant theme, manifested through several initiatives highlighting the role of accepting different rhythms of transformation, such as having to slow down, observe, reflect, and connect one's inner purpose with what was happening in the initiative. It appears that the acknowledgment of invisible processes can help move transformation beyond the physical state to also include emotional and spiritual elements which can help deepen a transformational process.

Active/passive absence. Although the value of 'practices' was present in this learning aspect, whereby participants appreciated new, concrete information and ideas for sustainable living (i.e. filling passive absence), there was a noticeable lack of participant references to more politically charged understandings of active absences such marginalizations or people left out or excluded from the T-lab processes.

Leaves represent expansive learning, where barriers are being addressed, whereby subjects refer to learning activities which generate solid, long-term changes. The dominant theme of this learning stage was 'order'. There was a felt need to find some form or structure that could assure continuous learning by having frequent organized reflexive moments, such as the *circulo de palabra* as a facilitation tool, mentioned in two of the T-Labs. Such a structure can be motivational in learning new ways to communicate and learn from one another, as well as in bringing other important values such as 'responsibility' to a transformative process.

Blossoms represent the stage when a process becomes an example for people outside their own process, who learn and become inspired, thus pollinating other processes and fertilizing new ideas. An important value at this learning stage is 'education' , whereby participants have the time to reflect on what he or she has experienced, putting it into context of their own learning journeys.

Seeds represent the replication of transgressive learning, for example when a subject mentions reports, methods, results, new perceptions, skills and tools which they have used in other contexts. At a 'practice' value, some subjects shared examples of skills learnt during the T-Labs that were replicated in other contexts. Yet a stronger value than the replication of skills was the value of 'optimism' expounded by subjects. This represented a strong emancipatory aspect of learning, for example, taking responsibility for the transformations needed in society, and a conviction that this was possible after participating in the T-Labs.

Although each of the four T-Labs focussed on different issues, the Living Spiral model provided a learning framework applicable across all the contexts. In the following sec-

tion, I will discuss how the values in the above learning stages can be viewed as 'signs' of transgressive learning taking place in the T-Labs.

7.4. Signs of spiralling transgressions

As Snyder argues [108], focusing on the *processes* of transformation help us improve how we teach and learn from one another, leading to empowerment and positive change, rather than attempting to 'measure' up to the theoretical ideals of what transformation is or could be. For this reason, our case study and the T-Learning project in general has preferred the term 'signs of' instead of 'indicators of' to shift away from the tendency towards measurement and quantification, which can get in the way of the kind of emancipatory learning that is advocated in addressing planetary challenges such as climate change.

Developing signs for transgressive learning has been a challenging task. As T-Learning colleague Stefan Bengtsson argues, there is no definite understanding of transgression, as transgression itself involves the undermining of rules and boundaries [61]. Yet this undermining of rules and norms, in itself, suggests signs of transgression is taking place. In the following sections, I will discuss the empirical results to illustrate how, in specific contexts, there are situations and subject experiences which provide value-based 'signs' of transgressive learning taking place (or not).

Acknowledging uncertainty leading to taking a step back and reflecting.

The most frequent value in coding references in the empirical data was 'acknowledging uncertainty'. This could be understood as a 'sign' of transgressive learning taking place, characterized by a disruption of the status quo of what is normally understood, and valuing the ability to accept and let go of what is beyond our control. Earlier research has demonstrated the importance of disruption in learning contexts through opening up possibilities for change within a system, through engaging in ontological politics [80]. This transgressive characteristic of a 'break with continuity' [61] is highlighted by participant Sebastiaan, in the Lekker Nassuh T-Lab who states that, *"we run into resistance, within ourselves or within the community... each moment that could be transgressive to me has something to do with blockage or resistance being solved in a way."* (appendix 6, pg 224)

Acknowledging the uncertainty resulting from barriers in learning processes promoted reflexivity in the participants. A strong sign of transgressive learning taking place in the T-Labs was the case of Lekker Nassuh in the Netherlands, whereby various participants expressed the tension between resisting hierarchy in the organization of the initiative, and the increasing recognition of the need for structure so as to provide order and clear roles and responsibilities for activities. In a common sentiment shared by the other T-Labs, participants in Lekker Nassuh reached the difficult conclusion that they had to change the rhythm of their initiative; stop, take a step back, reflect, and reorganize themselves in relation to their initiative. Margarita in the T-Lab of Las Islas del Rosario described this process as inhaling and exhaling, while Andres in the CotM described this change in rhythm as the contraction of a spiral. Being able to value the need to step back, and not control everything in a process is a clear sign of transgressive learning taking place.

Community and relationality driving deeper questions of purpose and belonging.

Another common value in the interviews was the importance of building relationships between people and territory in the T-Lab se-

ttings. A metaphor used in the CotM T-Lab was the metaphor of 'weaving' relations between participants and the territory, and these values were particularly evident in the learning stage of the roots, representing the place-based context in which learning was taking place.

In the Aldeafeliz T-Lab, a fundamental tension was the search for belonging. This manifested itself in the tension between the desire to connect to one's ancestral place (practices and beliefs of people who previously lived in the territory) and the acknowledgement that participants had been brought up in a different modern world, and that there was a need to be true to oneself in deciding how to relate to the world around them. As co-researcher Tatiana Monroy states about the community of Aldeafeliz: *who are we? Are we Indigenous? Are we urbanites that want to learn from the Indigenous world? or are we a blend?* This encounter with different ways of relating in the world also came out strongly in the CotM, represented by how participant Yuluka described relating to the territory through embodying the climatic aspects of mud and rain, and how these difficult experiences taught her to question new things about herself. This relationality was similarly expressed by participant Edgardo in Las Islas del Rosario. *"One has to have a sense of belonging. If I am not aware of things, recognizing myself, then what am I doing?*

The appearance of the values of community and relationality represented a sign of transgressive learning when it led to a deep reflection on belonging. This involved going beyond simply a connection to a territory, but a questioning of who one really is, and one's purpose in life.

The challenges of unveiling 'absences' through transgressive learning

While in fields such as collaborative learning there is a bias towards questions of how to work together with actors *present*, a fundamental aspect of transgressive learning is making visible what is *absent* in transformative research so as to better capture the challenges of overcoming sustainability challenges. Although this aspect is not unique to transgressive learning, being present in fields such as social learning [111], its focus on identifying and addressing subverted forms of knowledge relationships makes absence a vital concept in transgressive learning.

Passive absence was reflected in the results from the different case studies. In the T-Lab in Las Islas del Rosario, there is the appreciation by participants of the importance of bringing new knowledge and skills in the workshop, which were absent before, such as the example of building with natural materials. In the T-Lab in Aldeafeliz, it is noted how the T-Lab made visible actors in the region, and like in Las Islas del Rosario, the experiential activities brought these actors together in a community process.

However, there are notably few references to people, ideas, or perspectives excluded in the T-Labs, in what we can understand as active absence. In other words, the research participants may have lacked a critical view of the potential power relations being replicated through transformative processes. It is of course easier to notice and talk about what we know and see, rather than what is absent and invisible in our lives. This can be taken as a sign of transgressive learning *not* taking place.

This lack of a critical perspective by participants can be seen as an area to improve on in future research using critical event inquiry. As an 'inquiry of discomfort' [72], whereby a more emancipatory approach to narrative research is taken, there is an invitation for the researcher to delve deeper into the assumptions of the research subjects, and ask follow up questions which ask more explicitly about absence in the experiences of the subjects. As interviews were conducted *in situ*, at the end of each T-Lab, I reflect that there was a focus more on the empathic connection with

interviewees, trying to *understand* the experiences they had gone through, rather than a more disruptive interviewing technique which wanted to *question* what the participants had experienced. In line with the characteristics of transgressive learning (table 1, section 2.2) above, the balance between the researcher being disruptive and empathic needs careful attention and reflection.

To conclude this chapter, collaboration can lead to new insights and alliances when attention is paid to what and who is missing in a process. Interestingly, Horlings et al. [112] have come to similar conclusions in their research on rural place leadership. The authors also employ the metaphor of a spiral to demonstrate how joint reflection and a collaborative spirit can result in an expanding spiral of new alliances and new institutional arrangements, which can lead to collective agency. At the same time, it is important to note in the spiral metaphor that what expands must contract, which, similar to Horlings et al. [112], reaffirms the vital role of reflexivity in working with uncertainty and change. So although collaboration is vital for transgressive learning, an equally important, though perhaps more challenging aspect, is taking a critical stand to acknowledging particularly *active* absences. In this way it is possible to deepen the reflexion process and promote more transgressive learning processes.

"As the flower announces the fruit, so the childhood of man is the promise of his future life" Rudolf Steiner.

After the converging moments and expansive learning processes described in the previous chapter, our research project was ready to bloom. In our metaphor, flowers represent concrete outcomes and actions directly resulting from one's process. In our case, this meant exploring what T-learning actually looks like in practice and how it could inform higher education. With the aim of designing a T-learning process that could show a way of decolonializing and contextualizing education in rural Colombia, we co-produced a semi-virtual course called *Turismo de Origen*, together with local community actors, to be taken with higher education students. Our strategy was to use the course as a flower to bring in pollinators in the form of community members, researchers, university students and other local actors in a transformative learning space. This section presents the results of this semi-virtual course, which is the culmination of our work as a team to connect community-based learning to higher education. We are particularly interested in answering research questions 3 and 4, relating to how to design and facilitate transgressive learning, the connection to higher education, and the levers and barriers to realising meaningful learning outcomes.

8.1. The multi-stakeholder course: Turismo de origen

"Three communities, one dream: to transform tourism in their region so that it increases biodiversity, fosters local culture, and takes care of local inhabitants and their social fabric."

So reads the flyer for the course that was organized, facilitated, and evaluated by the Colombian T-Learning team (see figure 17 below). Through employing participatory diagnostics, local co-production of pedagogical material, and Information and Communication Technologies (ICT), participants shared knowledge and practices from their local contexts, contributing to community

initiatives within and between their localities, recognizing traditional knowledge and the biocultural richness of their territories. The communities chosen had participated in the T-labs or had worked with co-researchers on previous occasions, thus interest and trust had already been built. We invited into the course members of the afro-community of Islas del Rosario, the peasant members of the association ANUC, and members of Camentsa indigenous community, living in the Valle de Sibundoy, Putumayo South of Colombia.

This course was a way of addressing a dominant theme in my doctoral work, namely, the connection between community-based learning and higher education (research question 4). Though both forms of learning are important, the synergies between them are often neglected [22]. As is normal in formal education in rural Colombia, curriculums are designed from what the Ministry of Education states is important for local communities to learn, and based on academic knowledge. Consequently, contextual relevance of Colombian education system in rural areas is low and does not always respond to the social and environmental needs of its context [23]. Our research was in line with academic debates in Latin America which argue the need for further research into decolonial pedagogies based on local and traditional currents of thoughts and praxis [113].

Referring back to section 4.3., the collective vision from our team-building workshop was to work towards creating a course based on

Figure 17. Flyer for the course *Turismo de Origin*

our experiences in the T-Labs we were holding, connecting communities with higher education institutions. That time had now come. We had been gathering information and experiences through the work of the co-researchers in each of their respective initiatives. Co-researchers had been facilitating T-Labs, conducting interviews with participants and facilitators, and reflecting on the day-to-day realities of community life through generating Living Spiral narratives. Through this research, certain needs and contributions from the communities themselves began to appear, which we, as the Colombian team, began to systematize into topics to be developed into a course.

With this information, we conducted a final participatory diagnostic exercise with the three grassroots communities connected to the T-lab processes, that shared a common interest in sustainability (see right-hand side of figure 18 below). A triangulation of data converged on a shared theme of tourism, with the three communities sharing a common struggle with mass tourism negatively affecting their territories. All communities were looking for strategies to reconcile tourism as a necessary source of income, versus its shadow side of cultural and environmental degradation. A shared desire was to use tourism as a means to promote local culture, increase biodiversity, as well as generate dignified livelihoods. *Turismo de Origen* (Tourism of Origen) – a form of tourism which promotes the roots and authenticity of the region – was decided upon by the Colombian team as the course focus (see appendix 4 for more details about this process).

A three day workshop with co-researchers was organized, whereby the multi-stakeholder course *Turismo de Origen* was designed, taking into account our research findings gathered previously with the communities. With the core academic team being called the *Koru* team,[31] liasoning with local organizational teams in each community, and the inclusion of a student group from the University of Quindío representing higher education alongside the *Koru* team, the multi-stakeholder course was ready.

Academic participants & organizers

University Students Group
Bachelor program of Social Work at the University of Quindío, Colombia
Facilitator: Thomas Macintyre
11 participants

Koru team
A PhD researcher
A PhD student
3 local co-researchers
5 Organizers

Local organization team
In each region the team consisted in 1 co-researcher from Koru team and 3 members from each community initative
12 Organizers

Grassroots participants

Indigenous Group
Members of Association of Artisans Tsbatsanamama
Southern Colombia
Facilitator: Tania Villareal
8 participants

Peasants Group
Members of the Association ANUC
Coffee Region
Facilitator: Martha Chaves
12 Participants

Afro-descendants Group
Members of the Community of Islas del Rosario
Nothern Colombia
Facilitator: Margarita O. Zethelius
11 Participants

Figure 18. Characteristics of the organizers and participants in the course *Turismo de Origen*.

31 | Koru signifies spiral, in the Te Reo language of the indigenous Maori of New Zealand, and was chosen as the title of the course due to the inspiration of the spiral in the way we wanted to teach and learn during the course.

The course had two main objectives. The first was actively engaging participants in a joint problem-solving process through providing practical tools for developing their local tourism projects. The second objective was exploring the possibilities for decolonizing dominant forms of knowledge and learning in Colombian through generating connections between technology, research and diverse stakeholders across society. The three communities represented different cultural groups (indigenous, afro-Colombian and peasant), each with their historical processes of marginalization in Colombia. From a perspective of epistemological justice [63], we wanted to value their local forms of knowledge by bringing them into dialogue with other academic and non-academic actors and perspectives during the course.

8.2. Designing and facilitating transgressive learning spaces

An important part of this doctoral research has been a focus on how to set the scene for transgressive learning to take place. Building on the learning outcomes from the previous chapters, I now want to present the three learning concepts used in the T*urismo de Origen* course, which address research question 4: *How can transgressive learning spaces be designed and facilitated so as to link higher education to community-based learning?*

Peer-to-peer learning: As we witnessed in the research school exercises in the previous chapter, a fundamental aspect of transgressive learning is the decolonial empetus on bringing to the foreground often marginalised voices to societal issues. A means of addressing this is to create conditions that build trust and a willingness to listen, share and learn amongst participants. Like the first team-building exercises in the Kankuamo community, and during the research school, this involved participants presenting their knowledge and experiences to one another through peer-to-peer learning. For our

course, we were specifically guided by the concept of Farmer to Farmer learning (FAF), developed by the agroecology movement in Latin America [114]. This involved the generation of pedagogical material, mostly in the form of videos, within community contexts, centered on community experiences, needs and what they have to offer other communities.

Project-based learning: During the T-Labs, the importance of basing learning around interests and practical projects relevant to community initiatives had become clear. Whether it be bioconstruction based on ancestral building practices (T-Lab Aldeafeliz), or learning how to auto-organize around non-hierarchical principles (T-Lab coffee region), learning which contributed to practical processes was highly valued. Project-based learning was therefore used in our course, which involves inquiry-based learning through practical projects that reflect participant knowledge and experiences [115]. At the start of the course, each community created a seed bank of possible projects framed in the *Turismo de Origen* idea. During the course, through the virtual material and face-to-face workshops, each community put forward a project they would work on together, and presented it to the rest of the group. The student group played an important role in synthesizing the projects of each community into a national tourism route, which was presented back to the whole group for feedback and inspiration.

Blended learning: A challenge in this research has been how to out-scale learning taking place in the context of individual initiatives to other sectors of society. The original idea was to use the intercultural gathering of the CotM as an educational space to give the course. When this plan fell through, we had to think of something else. One idea was to set up a Massive Online Open Course (MOOC) made up of community generated material, available open access to the public. However, such massiveness tends to result in quantity of learning over quality, and our T-Labs

and own research process had demonstrated the importance of personal interaction in the learning process and avoiding grandeur visions in transformational process. As a means to connect geographically diverse participants in the course, while minimizing the loss of personal connection between participants, we decided to work with connecting face-to-face learning with Information and Communication Technologies (ICT), known as blended learning [116]. Through a collaboration with a Colombian company called *Nuevos Medios*, who develop online learning platforms, the Colombian team was trained in how to upload and organize learning material into a structured course, which would be accessed by a limited number of participants from different sectors of society. In addition to watching video material and carrying out readings in each learning module, participants were encouraged to communicate with each other regularly through a mobile phone messaging group (whatsapp), whereby they would complete homework assignments after each module which were shared back through the phone messaging group. Importantly, to bring in the face-to-face component, we carried out two video conferences using a virtual platform called zoom.

The course *Turismo de Origen* was carried out in November 2018, and the above learning concepts in action contributed to creating a space which was highly valued by participants. For example, student Alejandra shared that she enjoyed the methodology of having three different communities each with *"their own cosmologia, ways of understanding the world. The course helped us understand each one of them"* (see appendix 4, pg 185). In the following section I will share some personal reflections on the extent that this course resulted in transgressive learning amongst participants and facilitators.

8.3. Levers and barriers to realizing transgressive learning

Through the *Turismo de Origen* course, our project finally began to blossom with a concrete contribution to innovation in higher education. This was expressed through bringing into dialogue the often marginalized knowledge present in grassroots communities, with the more dominant knowledge systems in higher education. In evaluating the course *Turismo de Origen*, we wrote a paper exploring the research question 4: *What are the levers and barriers to realizing transgressive learning?* (see appendix 4). I will share some of our findings.

In terms of the flowering of transgressive learning, there were two points which came out strongly in this course, and which contribute to a better understanding of the levers and barriers to realizing transgressive learning.

A lever to transgressive learning was the empathy generated during the interaction and learning between participants from vastly different contexts. As characterised in table 1 (section 2.2), the ethics of transgressive learning is based on a philosophy of caring and empathy. The *Turismo de Origen* course was comprised of material generated in the communities themselves, featuring members talking and presenting their experiences, and watching each other and themselves in the online material was highly appreciated by participants. During the course, participants sent video, voice and text messages to one other, sharing traditional food recipes, medicinal properties of local plants, challenges in their territories, as well as advice and support for other participants.

An experience which many participants particularly connected with were the video conferences of the course. The experience of peasant participant Guillermo from the

association ANUC was a good example of the impact of the video conference. Guillermo had struggled with the ICT during the course, but shared his amazement that the facilitator for the video conferences was in Spain. *"She* [co-researcher Tatiana Monroy] *could connect us to the community in Las Islas and the Camensta. This is something amazing. How the world is changing."* [Annex 4 pg 182].

I have participated in many online conferences where poor internet, poor facilitation, or lack of interest by participants have rendered the meeting unproductive and uninspiring. However, the moment when we were talking to each other through the virtual platform, across the geographic locations of three communities, excitement in the eyes of everyone, a feeling of connection, that we had crossed boundaries of geography, time, and ways of learning, this was indeed "something amazing." This was a powerful image for me of *what* transgressive learning is in practice. This experience was not disruptive in the sense of identifying absences, inequities and contradictions, but I reflect on it representing an unexpected learning moment of connection and empathy between very diverse participants who would normally not be in contact with one another. There was a feeling that anything is possible, and we all had something to contribute with and learn from. In this way, this experience highlighted the values of community and relationality, and unknown possibilities, highlighting signs of transgressive learning taking place.

A barrier to realizing transgressive learning was in balancing this empathic characteristic of transgressive learning, with the 'warrior' stance of activism - resisting unsustainable norms so as to bring about more regenerative societal outcomes. A strong focus of the course was a decolonial pedagogy in which the communities themselves would become the protagonists of the course, as a means to recognize and value their own experiences and skills. Surprisingly, this decolonial focus acted, to some extent, as a barrier to trans-

gressive learning. As the coordinator of the group of university students participating in the course, I was excited to observe how the students and community members would interact, and what they would learn together. Although most of the students were active and engaged in the course, there was one student who had completed all the course work, but was not interacting with the other participants. Approaching this student and asking the reason behind her lack of integration with the group, the student's reply was: *"Who am I to comment on 'other' forms of knowledge? Other participants come from communities where there is so much culture. I have nothing to contribute with."* (appendix 4, pg 187). This reply struck me as deeply paradoxical. The logic of the course was that it was the communities 'telling the story' of tourism in their territories, instead of this role being assigned to an outside expert. But the assumption had been that all participants would engage in the conversation on an equal footing, and I had expected the students to play a leading role in sharing personal insights. Although I do not believe this feeling of marginality and lack of self-worth was representative of the student group, a common student reflection during the focus groups was that the student group had not managed to integrate and contribute enough with their knowledge to grassroots initiatives. Although the students stated that they had learned a lot, there was a strong feeling that they had learned more than they had shared, and this was partly because the community members were the protagonists, not the students. This was disappointing for me, as it demonstrated a limitation to the effective bridging of the student and grassroots groups.

Discussing the above situation with the co-researchers, we reflected that there are clearly embodied power differences between participants of different backgrounds, which we had not taken into account. Inadvertently, we had swapped a dominant 'expert' paradigm with a marginal 'community' paradigm, which is a risk in decolonizing pe-

dagogies [117,118]. So although we had based our course on the documented importance of transdisciplinary knowledge in decolonizing the curriculum [117], we had to some extent undermined the objective of transgressing the forms of learning between the different participants by not taking into account power differences from the start of the course. In future courses, it would be advantageous to create spaces and exercises where participants can openly discuss their relations with one another, and potential 'active absences' could be identified and addressed.

Reviewing the learning concepts presented earlier, focus groups highlighted that participants enjoyed the learning modules and the interaction with other participants (peer learning). It also became clear that the use of the TAR methodology of co-researchers having strong links to participant initiatives meant that there was a sense of continuity in the community projects, even after the course was over (project-based learning). Furthermore, ICT had acted as a surprisingly strong lever for learning taking place between diverse participants, demonstrated especially through the success of the video conference. Although ICT is a sensitive topic when working with indigenous communities [119], miscommunication and cultural misunderstandings were minimised through the skills of the co-researchers in maintaining trust with their respective initiatives. For example, through taking care with matters of informed consent and audio-visual rights of pedagogical material.

However, when we consider the extent to which learning in this course was transgressive, one cannot deny the presence of underlying power dynamics acting as barriers in the transgression of old paradigms by participants. As research in Colombia in the field of water justice has shown, there are strong, competing narratives with different power sources that make negotiations between different interests and values difficult [120]. When I reflect on the reason why the issues of power relations in the course *Turismo de Origin* were not investigated in more depth, I am left with the sensation that perhaps in practice we concentrated more on the empathy side of transgressive research (creating connection and understanding between diverse participants), rather than the disruptive aspect of critically questioning the underlying assumptions of the participants.

This begs further questions of when transgressive learning is needed in transformative processes, and how it is best promoted. As research into natural resource management amongst aboriginal populations in Australia have shown [121], consensus building is an important part of bringing parties together to seek win-win situations through collaborative management. However, consensus building risks legitimizing the hegemonic power of the state, resulting in little transformative power. For this reason, aboriginal communities engage in constructive conflict strategies, for example through public protests. Rather than incremental change, such constructive conflict can catalyse more rapid institutional change through visibilizing power relations, and as an important lesson to transgressive learning, can be used strategically to address social, economic, and political inequalities.

Chapter 9: Seeds – reflexive conclusions on transgressive learning

In the Living Spiral model, seeds are the unit of replication whereby transformative and transgressive processes are activated in other contexts. Like many plants, the *botón de oro* has seeds which are spread through the wind. However, the plant also has the interesting characteristic of allowing reseeding through live stakes, i.e. cutting a branch, and planting this stake in another location. This is one of the ways I have been regenerating the land on my farm, and is how I understand the replication of transgressive learning. Rather than seeding a new process from scratch, a living segment of a process can be transplanted in another context, catalysing ongoing processes. In this closing chapter, I will share some of the live 'stakes' I feel are ready to be planted in other contexts by responding to each of the sub-questions of the main research question: *To what extent can transgressive learning, as a more radical form of learning-based change, lead towards more regenerative transformations?* I will conclude with a personal summation of my doctoral journey.

9.1. Learning towards an unknown future

Research sub-question 1: What are the learning orientations and approaches that encourage change and transformation in the context of climate change?

I started this story stating that its purpose was to question the way we learn in an increasingly uncertain world. Deep down, I think most of us recognize that we need to address fundamental changes taking place to our planet, and although we may not like it, this will involve changing the way we live and relate to the world around us. Yet such a recognition is made difficult through the saturation of information, (fake) news, (fake) environmentalism and what seems like an acceleration of life, where we are continually bombarded with, for instance, climate catastrophes from around the world. So what can we do? Resort to denial, depression or action? These are three different ways of responding to the tremendous challenges facing all of us today. Through action research, the contention of this thesis has been that

action-based change is the most generative form of addressing climate change. Fundamental to this is the notion that we must *learn* our way towards sustainability [11].

As there are many ways to learn, it was important to explore what learning approaches encourage transformation in the context of climate change. An early literature review suggests that transformation and transition-driven approaches which emphasise the emancipatory, participatory, value-laden, transgressive co-engagement in complex matters of concern and transformative actions, can help address the root causes of climate change [32]. The empirical results of this thesis (see especially appendix 3,4 and 6) have shown that indeed such an approach can address the root causes as long as the process acknowledges the many, inevitable uncertainties involved, and recognizes that transformation pathways are iterative and volatile, sometimes expanding, sometimes contracting, and do not follow a linear logic. Reconciling and working with these characteristics in a way that generates optimism and responsibility requires a culture of T-learning with high levels of experimentation, critical thinking, reflexivity and flexibility, as well as the mutual trust that results from a more caring and empathic understanding of relations.

The 'living stake' or key message of this section might be that we must endeavour to be open to all forms of learning in addressing systemic global dysfunction of which runaway climate change is a most troubling manifestation, as specific learning forms can address some needs and contexts which other forms cannot. However, if we think of climate change as a manifestation of deeper structural inequities, which are highly resilient and resistant to change, then forms of learning which engage multiple stakeholders in a critical, reflective, disruptive and regenerative way, are crucial. We need to learn to transgress, and transgress to learn, and this is a vital, future endeavor of academic-practitioner collaborations.

9.2. Conducting research is a learning journey

Research sub-question 2: What are researcher qualities that can help establish more transgressive forms of learning-based change?

A defining quality of transgressive learning is the openness of the researcher to undergo a personal transformative journey intertwined with the transformative processes they are investigating. The traditional role of the researcher changes in this arena, moving away from the impartial stance of positivist science, and towards the more reflexive pose of the action researcher.

However, as my journey through the Living Spiral has shown, transgressive learning is a process of ups and downs. There are no manuals or recipes to follow, and the only thing that is certain is that things will not turn out as planned. Early on in my research, I identified the researcher qualities of courage, empathy, and reflection as fundamental in balancing the needs of top-down and bottom-up transformations [12] (appendix 2). Through my collaboration with co-researchers in this project, and our joint reflections on the T-Labs, these qualities have developed further[13] (see appendix 3). An important quality was recognising the invisible in the research we are carrying out, and daring to embrace it. As co-researcher Tatiana Monroy wrote, this requires that we throw ourselves in the unknown and enjoy the experience of being suspended between worlds (section 6.1.). Another researcher quality, which only so-called 'embodied experience' could have brought forth in me, was the ability to take a step back from a process and to reevaluate one's purpose. This was vital for me as a researcher after the Call of the Mountain event. Interestingly, this is a value which comes out strongly in the empirical research of all the T-Labs described in section 8.2. This highlights the living nature of transformative and transgressive learning: such learning is alive,

breathing in, breathing out, expanding, then contracting. This quality of caring for the natural rhythms counterbalances the more disruptive element of action and intervention.

A key message to take from this is that the organic nature of transgressive learning calls for particular researcher qualities. At the end of the day, the researcher must learn to accept the spiralling nature of learning: learning when to step in and intervene in a process so as to bring about beneficial transformations, and when to be patient or let go of a process which one is not contributing meaningfully to. It is important to point out that transgressive action research is an indeterminate process which may result in a state which might not necessarily be a desirable one. This demands a lot from the researcher to stay in the unknown, and, perhaps even, the unknowable. In the words of Donna Haraway, to 'stay with the trouble', referring to the need to stay truly present in today's troubling times through connecting with what is around us in novel configurations [122].

9.3. The warrior versus the empathic stance to transgressive learning

Research sub-question 3: What are the levers and barriers to realizing transgressive learning, ensuring that learning is generative instead of destructive?

Staying with the trouble involves negotiating two tendencies in transgressive learning. The first is the 'warrior' stance of disrupting norms, through shaking up beliefs. In other words, forms of learning which force us to leave our comfort zones and experience something different from what we know and understand so as to make us question our basic assumptions about the world and ourselves. The danger is that this more aggressive stance can lead to pushing people away as they feel threatened by things different from what they are used to.

The competing empathic stance addresses the polarization of society, stressing the need to transgress differences between people through developing the skills to put oneself in the shoes of somebody else, understanding why they may be thinking in a different way, and looking to reconcile these differences. The danger of this approach is that the learning environment becomes too safe, whereby there is a lack of critical feedback between participants for fear of seeming insensitive.

In terms of the levers of realizing transgressive learning, a strong driver was the focus on existential questions grounded in local circumstances. This placed a focus on relations to place, manifested through the generation of informal learning spaces in community settings. We can see this in T-Lab in Aldeafeliz, where the interaction between modern and ancestral knowledge systems and practices led Tatiana Monroy to a continual reflection on 'who' she and the community really were. In the course *Turismo de Origen*, this deeper reflection of place was manifested in the task of each community having to explain their territory, their culture and their struggles to other participants of the course. Presenting and listening to their respective territorial challenges and on-going projects encouraged participants to reflect on their own practices and assumptions in light of their changing connections to place.

Another lever was technology as a tool to increase social interaction and self-awareness amongst participants. Although ICT has been regarded as detrimental in educational contexts due to being addictive and a distraction, creating a distance between people, and between people and place, [123], in our case, we believe that the participating communities positively embraced the tools, and adapted to the new digital technologies according to their own traditional knowledge, as has also been shown by Salarzar in research in Latin America [124]. With co-researchers taking special care to organize and ensure informed consent with their res-

pective initiative, ICT provided a mechanism to connect participants through building 'affective bonds' with one another (appendix 6 pg. 179). A strong example of this was the experience of the video conference, which not only connected participants across cultural and physical spaces, but also shifted the expert-subject relationship through recognising the value of each community initiative to share their experiences and learning outcomes with one another.

Finally, transgressive learning invites diversity and dissonance in order to deepen learning, recognizing multiple ways of knowing and being in the world. This last element pointed to a strong structural barrier to bridging learning in the form of negotiating power relations. In our desire to subvert the academic 'expert' in favor of community empowerment, we inadvertently tipped the power scales by marginalizing the role and voice of the students participating in the course. The extent to which this marginalization has to do with power is arguable - perhaps it has more to do with how a person values their self-worth, or their sense of hierarchy. But as Lekker Nassuh T-Lab participant Lisselotte notes, all systems are made to survive, and attempting to disrupt those systems will "kick us back" (appendix 6, pg 218). This highlights that although confronting inequities and power imbalances is important, it is a fragile process which requires responsible and responsive ethos to fostering not just renewal of higher education [25], but also, more generally, of intercultural empathy.

The key point to take away from this is that in addition to facilitating the conditions for transgressive learning, it is fundamental to be cognisant of what such learning may lead to, promoting a strong transformative process which can harness disruptions in a generative way through balancing the disruptive and empathic elements.

9.4. Designing and facilitating transgressive learning

Research sub-question 4: How can transgressive learning spaces be designed and facilitated so as to link higher education to community-based learning?

Transgressive learning spaces do not arise by themselves. They require careful design to insure there is a diversity of actors and perspectives present, as well as a facilitator with a toolbox of methods to insure the space is a safe and reflexive environment, which promotes collaboration and meaningful empathic communication between participants.

Fundamental for bridging the community settings of the T-Labs and higher education were the co-researchers. With their intimate relations and built-up trust with each initiative they represented, co-researchers held an invaluable understanding of community dynamics. They also possessed initial research skills which they developed through the project to explore their personal transformations, as well as transformations taking place in the T-Labs and their communities. In this way, co-researchers acted as cultural brokers, bringing knowledge generated in the community settings to academia. In turn, I facilitated this knowledge translation, for example, through publication of peer reviewed papers where co-researchers were co-authors.

Conversely, the role of higher education in the community initiatives was providing a framework, conceptualization and an analysis for the T-Labs, from which we connected the T-labs in the different regions together, manifested in the course *Turismo de Origen.* Based on these experiences, I was able to identify five design and facilitation principles for transgressive learning spaces to link higher education to community-based learning:

1 *Encouraging critical thinking through decolonial peer-to-peer learning:* The importance of acknowledging all forms of knowledge as valuable and useful, but maintaining a healthy critique of the assumptions of each one. This involves facilitating a dialogue of diverse knowledge forms in a manner which supports reflexivity in participants.

2 *Promoting regenerative action through project-based learning:* This is vital for bringing to life learning processes in a way that motivates and inspires participants to focus on practical projects in community initiatives. When such projects connect participants' desire to regenerate their local territory through action, with the learning about themselves in connection with their territory, transgressive learning possibilities emerge.

3 *Ensuring contextual learning through cultural brokers:* To contextualise learning between community contexts and higher education, there is an important role for cultural brokers to bridge the needs, and contributions of each knowledge community. Co-researchers acted in this role, not only helping myself as the lead researcher understand forms of knowledge foreign to my worldview, but also conveying the relevance of academic skills such as mapping, documenting, analyzing, synthesizing and critical thinking, to community members.

4 *Combining place-based and blended learning:* Central to facilitating the logistics and the quality of encounters between geographically and culturally diverse communities and higher education participants, is generating synergy between place-based spaces and virtual spaces. Facilitating the interaction between community members with their own day-to-day activities,

and students with their own interests and needs, helped generate real, personal connections between participants and the places they inhabit.

5 *Identifying power relations and balancing disruptive and empathic forms of learning:* Perhaps the most challenging aspect of transgressive learning is designing a learning environment which is sufficiently disruptive to provoke critical reflection of participants' assumptions of the world, yet safe enough to contain the emotions and value-saturated perspectives of participants in a transformative environment. This places importance on the role of the facilitator to identify and negotiate the power relations between participants in a way that generates meaningful and empowering encounters.

These five principles were essential for encouraging the interaction, reflection and, most importantly, empathy between the various stakeholders in the transgressive spaces that we generated. The key message is that to link community-based learning to higher education in any setting, it is necessary to at least comply with principles number 1 and 3, as the first establishes the learning environment and the ethics of collaborative spaces, while the latter makes learning possible between diverse actors. The other principles bring tools to help the process flow and to amplify T-learning.

9.5. Reach for the sky, knowing your roots are firmly grounded

This narrative is now coming to an end. We have followed my Living Spiral from start to finish, and it is now time to bring this journey to some kind of closure. I have presented not only transformation processes amongst community initiatives and co-researchers,

but at the same time my own transformative learning trajectory. Remembering how my doctoral journal began, and considering how I feel now and what I have learned, I feel something of a regenerative spirit. This is a feeling that I have started to repair something broken inside of myself, something I could describe as recognition of the organic processes of life and death. I have come out of this thesis less certain of things than when I came in. Strangely though, this makes me feel there are more possibilities for myself and the human and non-human collective I am part of to work towards more socially and environmentally just futures.

As an action research project, I have been privileged to work with people on-the-ground, people who I would describe as agents-of-change. These are people actively working towards positive transformations in the places they inhabit in ways which respect their local culture and environment. The innovation of this project turning into *Transgressive* Action Research highlights, however, that working *with* people in and for transformation, involves a high degree of uncertainty, change, and flexibility in the research process. I have found this immensely challenging in my research.

Accompanying my research journey has been the Living Spiral metaphor. We can understand the spiral as an important symbol and transformation metaphor that can be found in many cultures and as existentially critical in nature, which we can view as a 'meme', a replicable idea and source for learning that can move from mind to mind with varying degrees of fidelity [125]. The Living Spiral was instrumental in structuring this thesis, as well as in providing a tool for analysis, as it recognizes that transformation is a living process, expanding, contracting, dying and being reborn.

From the start of this thesis, the argument has been that to address the existential threat of climate change, there is the necessity for fundamental changes in our society, at the level of beliefs, values, actions and societal structures. Rather than the more visible and perhaps easy to measure climate change strategies such as 'healing concrete' (section 6.4), values, for example, are complex, messy and highly contested. I have argued, however, that promoting values such as acknowledging uncertainty, community and expanded notions of relationality can act as 'signs' to transgressive learning taking place through leading to a deeper questioning of one's basic assumptions about the world. This opens up the opportunity to address the deeper roots of climate change disruptions, such as our need to be in control of our surroundings, and our disconnection with the web of life. When such reflections lead to positive impacts on ourselves and our territories, then we are creating more regenerative futures. This story provides only a glimpse of what this might look like, for example, through the T-Labs and the course *Turismo de Origen.*

However, the main research question of the 'extent' to which transgressive learning can lead to regenerative futures has not been easy to answer. Transgressive learning resists easy definition and measurement, and its focus on disrupting structural barriers to sustainability and societal norms that want to survive is immensely difficult to achieve. For now, this thesis has empirically developed 'signs' of transgressive learning taking place, and although this may seem vague, it highlights the uncertain, contested, and ultimately ephemeral nature of such learning. Much more research is warranted in exploring what transgressive learning looks like in practice, with special attention to identifying and addressing power relations and active absences so as to open up new paths to more regenerative futures.

That said, like the poet Robert Browning writes in this chapter's opening quote, there is something heavenly about not being able to grasp and understand everything in this world. We can make plans, envision research goals, and reach for the stars, touching what might have been, but never being able

to quite grasp that reality. Learning to acknowledge this uncertainty, however, gives us the opportunity to harness our human potential towards reaching ever higher. Would we want to live in a certain world, where everything was predictable and there are no mysteries to solve?

And so, under the watchful eyes of the howling monkeys, I take out my machete, and with a quick strike, cut off a few green stakes from the mother *botón de oro* plant.

Walking the land, identifying where the soil needs roots to hold it, and biomass to fertilize it, I plant the stakes into the ground. Like many attempts at replicating transformations in our lives, not all stakes will survive, but the point is to plant strategically those that I can. There may not be enough water or the right nutrients in the soil for the stake to survive. But some stakes will take root. And they will grow. And new transgressive processes will take off from the roots up towards the sky.

9

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Appendices

Published and submitted works based on the thesis

*Please note that all numbered citations in the following appendices are found in the above reference section.
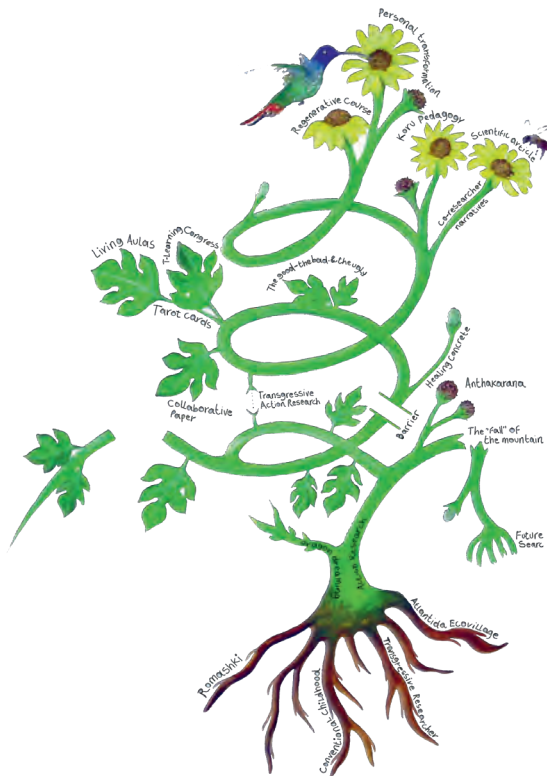
Appendix 1.

Towards transformative social learning on the path to 1.5 degrees

Abstract

This paper provides insights into learning orientations and approaches that encourage change and transformation on the path to achieving the 1.5 degree C target. This literature review of the climate change and education/learning interface positions relevant literature in a heuristic tool, and reveals different learning approaches to addressing climate change. We highlight that although traditional lines of departure for achieving climate targets are usually technocratic in nature, especially if a zero emissions pathway is aimed for, there is an increasing realization that climate issues are complex, deeply intertwined with un-sustainable development and cultural change, and require collective engagement. Through considering the 1.5 degree C target as a metaphor for the fundamental changes needed in society, we argue that a wide range of learning orientations, including more inclusive and transformative social learning approaches, are needed to address the colossal challenges facing society.

1. Introduction

Education and learning, play a leading role in human development and societal transformations [126], including climate change, with the IPCC [27] highlighting the need for learning-centred transformation in climate change adaptation. Yet in an increasingly polarised and value saturated context of climate change disagreement [34] it is unclear what different orientations of learning there are, and how different learning approaches can inform the pathways to 1.5 degrees C.

The 1.5 degree C target agreed upon at the Paris climate change summit is often perceived as a technical goal to be achieved through transformations in, for instance, energy production and carbon storage technologies [127]. This is closely connected to a focus on political will in closing the gap between science-based targets and national commitments [128]. Within this socio-technical genre of thinking, education can also be technically 'used' along with communication and social marketing to promote urgent measures to address climate change. Here the focus is usually on behavior changes related to energy and emissions via transmission of authoritative, scientifically derived information and facts. Such approaches may

be useful and necessary as they can induce a change in human behaviour [128,129], but there is also the increasing recognition that in a 'post-truth' world of 'alternative facts', there is a need to explore new ways of conceiving, framing, producing and communicating science [130]. Van der Linden et al. [131] suggest, for example, 'inoculating' the public against misinformation through pre-emptively warning people about politically motivated attempts to spread misinformation, a process that requires critical engagement if it is to avoid becoming a new form of social engineering. Modes of knowing such as critically reflexive engagement with scientific knowledge, that science may not always easily illuminate, thus also need fair and urgent consideration as we strive to face the challenge of climate change [34,132].

Given the notable climate events of 2017 (e.g. devastating hurricanes, whose attributions coupled to climate change are still being examined) the notion of a 'new normal' for current climate is being debated (for example, recent Water Research Commission Conference in Johannesburg, September, 2017). Next to seeing the 1.5 degree C target as a technical target [27,128,129], this ambition can also be perceived as a metaphor to indicate fundamental changes needed in personal belief systems, values, structures, and ways of organising societies and economies. Such an approach can surface difference in perspectives, and highlight the synergies, contradictions, controversies and conflicts inherent in climate change debates. This calls for social engagement [133], and in some instances, for the exploration of alternative ontologies and lifestyles [80]. A shift from facilitating changes through optimization towards reflexively learning to understand differing views, perspectives, cultures and ways of approaching climate change can begin to point to those areas requiring personal and societal transformation [111,134]. These expanded paradigmatic approaches are gaining much traction (e.g. recent Resilience Alliance Conference in Stockholm, September 2017; Transformations Conference in Aberdeen, September 2018). In this paper we note this expanding reflection but focus much of the paper on the role that education and learning can play in building capacities for critical thinking, reflexivity, systems thinking, collaboration, collective agency and transformative practice [111].

2. Methodology and framing the review

Engeström et al. [38] argue that most research on learning is conducted in formal educational settings. In the context of 'wicked problems' [62] such as climate change, however, more research is needed in real-world situations and informal contexts [80]. Following this line of thinking, this review covers formal, as well as organisational and informal learning contexts in a multi-disciplinary 'melting pot' of research from the learning sciences [38,80,111,126,134–138], transition sciences [129,133,139,140], and environmental and climate sciences [35,36,127,128,141–145].

Common keywords were used in the literature search (climate change, education, (social) learning, sustainability, transformation, transition) across the search engines of Scopus, Web of Science, and Google Scholar to identify articles that were drawn from the multidisciplinary fields outlined above. We particularly sought to identify those papers focussing on meta-theoretical and large-scale studies, global perspectives, and paradigms of thinking associated with learning and climate change that have been produced in the past seven years (2010-2017). The papers selected address the climate change/education and learning interface directly or have direct relevance to this focus. We then differentiated the selected papers for their different approaches and learning orientations. In the context of this paper we

have used 'learning orientations' to indicate the contextual dynamics that shape learning, and also the purposes that drive the orientations. For example, a policy orientation would indicate that the learning is oriented *mainly* towards policy implementation. We also found that the contextual dynamics were shaped by diverse institutional settings, for example organisational learning is shaped by more formal organisational settings, while traditional science-based learning is shaped by the history of science education that emerged in formal education settings. Policy oriented learning is shaped by policy imperatives, and transformation/transition oriented learning appears to shaped more loosely by a diversity of less structured learning environments and histories, but most often foregrounded the need for multi-sector and multi-actor engagement. Through an iterative process we mapped out the papers in relation to these contextual settings and histories.

We then adapted Jickling and Wals' [33] well-cited heuristic for classifying emancipatory and instrumental forms of learning within the sustainability context, drawing also on Dillon et al.'s [146] interpretation, and through iterative engagement with the selected papers, we identified and mapped out four orientations to climate change learning, namely: science-oriented [36,128,129,135,141,142,147], policy-oriented [136,137,139,140], organisational/management-oriented [35,138,148–150]; and wider social transformation / transition orientations [38,40,48,80,143–145,151–155]. This allowed us to position the papers (see Figure 1), within a 'force field' heuristic, whereby two dotted lines distinguish the field within which the center of gravity of each of the four orientations falls. Those lines, however, are not meant to divide the orientations, but rather to provide a way of considering different orientations to learning, as well as how they may relate, and what their particular contributions can be to climate change and learning. As a final step, based on the papers reviewed, we distilled the characteristics and conditions needed for supporting change on the road to 1.5 degrees C associated with each of these orientations.
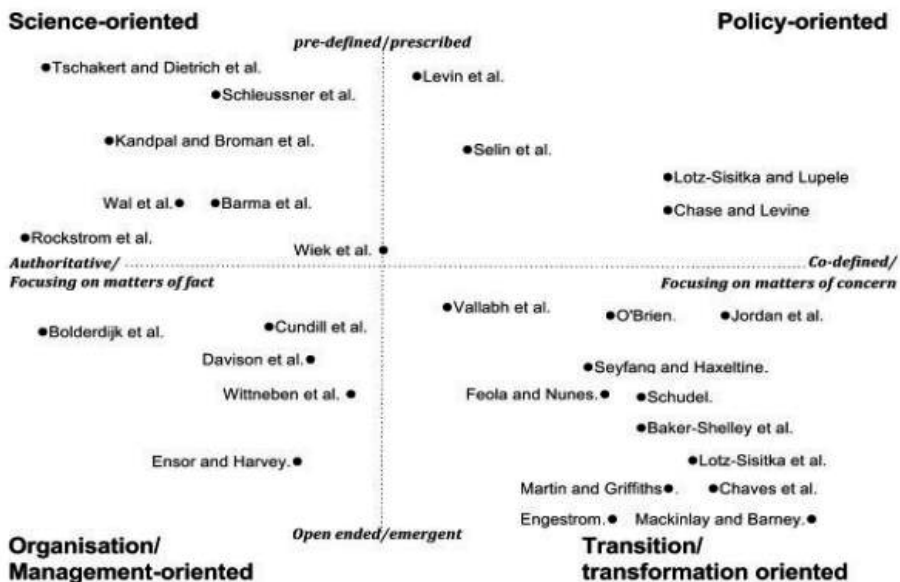

Figure 1. A heuristic for analysing learning orientations and learning approaches (Adapted from Jickling and Wals [33] and Dillon et al. [146])

3. Analysis of climate change learning as shaped by diverse learning orientations

If considered in more depth, the heuristic mapped out in Figure 1 displays a continuum of learning theory research, ranging from more behaviorally oriented to more inclusive and transformative modes of learning that emphasize reflexivity, capacity-building and competence. The juxtaposition in Figure 1 between predefined/prescribed and open/emergent learning approaches, as well as the division between authoritative learning approaches focusing on matters of fact (where we know what needs to be done and how to act with relative certainty) and participatory learning focusing on matters of concern (where we have a hunch but do not know for sure and need to engage people in a co-creative quest), allows for a more nuanced view of this continuum. It also allows for inclusion of approaches to climate change learning that include debate and deliberation about the kinds of changes required.

Each of the learning orientations tend to show specific motives, approaches and learning-related issues that are helpful to consider on the pathway to 1.5 degrees C. Hulme [34] notes that there are multiple, creative applications of the idea of climate change; applications that do not necessarily require agreement, as they "thrive in conditions of pluralism and hope, rather than in conditions of universalism and fear" (p. 363). This is not, however, a license for climate denialism, but rather an encouragement for engaging in deep and critical debates on how to address climate change and transform societies towards a less destructive, more socially just condition. Thus, it is in this sense that we also propose that rather than seeing the quadrants as distinct views, the idea is that multiple approaches (with blurred boundaries) may be needed if we are to begin to effectively address climate change, and if learning is to allow for engagement with the deep cultural and social-ecological rifts that have created the conundrum that climate change presents. Additionally, we recognise that none of these orientations on their own will 'solve' climate change, but rather that there is possibility of movement and transformative orientation towards 1.5 degrees C within all of these orientations. In the next section, we discuss each of these orientations from this perspective.

Science-oriented learning

The papers clustered into this quadrant tend to follow a fundamental assumption that scientific and technical knowledge can drive change, in the main reflecting an instrumental approach characterized by a 'transmission mode' [33]. In this form, knowledge of scientific facts about climate change is transferred to learners, with confidence in the knowledge and the course of action to be taken. There is an explicit urgency associated with the need to be clear about what forms of science and technology are needed for 'driving' rapid behavioral change as argued by scientists such as Schleussner et al. [147], and Rockstrom et al. [128], amongst others. One form is through anticipatory learning which, as argued by Tschakert and Dietrich [36], involves forward-looking learning processes that enhance adaptation and resilient livelihood pathways. Another is citizen science including the evaluation of a human–computer interface that provides feedback to citizen scientists reported by Wal et al. [141]. Yet another is renewable energy education which primarily seeks to provide functional knowledge of facts, concepts and technologies for strategic use of more renewable sources of energy [129].

However, there are also researchers that recognise that not all of the science associated with climate change is certain, and this brings traditional transmission approaches into ques-

tion. Wiek et al. [142] note the need for more emphasis on collaborative learning including actors outside of academia, as well as actionable change, while also emphasising the importance of systems-based scientific knowledge. Barma et al. [135] show that the uncertainties associated with climate science creates complex challenges for educators. They argue that pedagogical, epistemological and cultural 'adjustments' or transformations are required in formal science education if the nature and scope of climate science is to be fully engaged and accommodated [135]. It produces challenges for educators' transformative agency to change the way education and learning is approached. As argued by Rapley et al. [130], an example of this could be through innovative forms of communication with more of a focus on conveying the meta-narrative of climate change through personalised stories and dialogue.

Policy-oriented learning
The papers clustered into this quadrant tend to foreground the importance of learning as a means of enhancing policy implementation for achieving change. Here key policy drivers for climate change responses are mitigation, adaptation and resilience approaches. In this literature, emphasis is placed on direct transmission-based learning, but also on reflexivity expressed in the discourse of triple loop learning [35] and anticipatory learning [36]. Recent growing interest in transdisciplinarity of science building on the work of Gibbons and Nowotny [156] as a mechanism for policy implementation, is expanding the learning arena to include actors across a broad spectrum - working not *for* but *with* society [142]. Learning is therefore not only transfer-oriented with a linear policy focus, but includes a number of iterative learning cycles with a variety of practitioners. This shifts the focus from the science-policy interface to a science-policy-practice interface.

Proposing another form of policy engagement via learning, Selin et al. [137] argue that policy literacy is an important complement to climate science literacy, and that combining the two in education will equip future scientists to cross the boundaries between science and policy. Here the focus is on learning how to use scientific knowledge in policy decision-making. Such processes are accompanied by negotiation, decision-making, communication, participation and management skills, especially for scientists [129]. This can be compared to Levin et al. [140] who describe a more instrumental approach to dealing with 'super wicked' problems, which comprises path-dependent policy interventions with potential for wider social constraint.

Policy-oriented approaches to learning affecting climate change are also found in educational policy literature, where discourses driving concepts of quality education tend to focus more on efficacy and inclusivity than on linking local and global concerns, even in Education for Sustainable Development policy [136]. In response, Lotz-Sisitka and Lupele [136] argue for considering 'learning as connection' with society and environment as a key quality criterion in formal education settings. This has significant impacts on the possibilities for learning-centred responses to the 1.5 degree C agenda in the formal education system.

Organisational and management-oriented learning
The papers clustered into this quadrant tend to foreground the need for learning as a means of achieving organisational mandates or management objectives, which in turn can contribute to change. Cundill et al. [35] focus mainly on the role and significance of learning in building social-ecological system resilience in natural resources management contexts.

They argue that because social-ecological systems are complex and changing, social learning is necessary for the management and resilience of natural resources. This type of learning seeks changes in social units and changes at multi-levels [35,37].

Organisational learning related to climate change also involves employees in organisations monitoring their own impact or performance (intra-agency learning) with regards to environmental management or carbon emissions. In such contexts, there may be differences in the degree to which the employees participate in setting the objectives of the monitoring taking place [149], which has implications for the learning potential of such practices.

Wittneben et al. [148] note that climate change is also a "political issue where a variety of organizations state agencies, firms, industry associations, NGOs, and multilateral organizations engage in contestation as well as collaboration over the issue" (pg. 1). The work of Kristjanson et al. [157] and Ensor and Harvey [150] points to the importance of giving attention to inter-agency and institution-based social learning for transitions to sustainability.

In the context of organisational social learning and climate resilience, Cundill et al. [35] point to a need for further research to better understand types of learning (e.g. recursive loop learning and social learning), better integration of divergent knowledge systems, and better combinations of knowledge creation, monitoring and learning. More widely, Ensor and Harvey [150] point to the need for social learning research at the intra- and inter-agency level in sustainability transitions.

In the education system, building capacities for institutional change can in turn also foster innovation in teaching and curricula. Davison et al. [138] show how the development of a distributed leadership model among educational institutions and teachers has led to the development of an interdisciplinary and collaborative climate change curriculum and pedagogy leading to student empowerment. This again points to the importance of multi-levelled, intra- and inter-agency, as well as inter-disciplinary orientations to organisational learning on the pathway to 1.5 degrees C.

Transition and transformation-oriented learning
The papers clustered into this quadrant tend to follow the assumption that fundamental changes are needed in our society, at the level of beliefs, values, actions and societal structures. They foreground the complexity of learning in multi-voiced, inter- and transdisciplinary or social movement formations. In such education and learning contexts, it is not possible to deal with 'facts only' [38,39]. This requires engaging more with 'matters of concern' [40] in more open-ended, political and value-laden ways in and amongst wider social movements and inter-sectional communities [see 41], in ways that are oriented towards 'deliberate transformation' [145]. Here ethics, decolonisation, well-being and sustainability become some of the orienting narratives for transformative learning.

There is a recognition that learning in this quadrant involves various dimensions of transformation - personal, practical and political [145], and societal [39,150]. To avoid falling into a trap of behavioural indoctrination or social engineering [153], such education and learning needs to be constituted as open, co-engaged and more radically transgressive processes of reflexive change [38,80,153,158]. Baker-Shelley et al. [154] address this transformation in higher education from a whole system institutional approach and discuss the need for

systemic change at different micro, meso and macro levels within academia. Jordan et al. [155] emphasize the importance of collaborative science around local issues and engaging in iterative, collaborative, and adaptive learning, and Vallabh et al. [40], articulate different 'epistemic cultures' required for citizen science education that embrace social learning and social justice paradigms.

Schudel [153], building on Bhaskar [159], argues that such processes of learning involve engaging with what is present and known, what is not present, what *could* be, what *should* be, and what *can* be. This is reinforced by Mackinlay and Barney [152] who address emergent and 'unknown' matters of concern in decolonisation processes involving ongoing questioning of assumptions associated with social justice and praxis.

These approaches to learning tend to foreground individual and collective (relational) forms of agency [151], and criticality, new forms of ontological politics [80]. Martin and Griffiths [151] address the forms that change takes, arguing that there is a need to guard against transformation being at the expense of more marginalised social groups. Engeström does not consider learning as primarily 'cognitive expansion' but rather as a mechanism "...to produce new material objects, practice and patterns of activity" (pg. 9), involving transformative agency [38,39,126,153].

Within the 1.5 degrees C pathway, a great challenge in transformative based learning is to mainstream it into the wider education system [142]. As Seyfang and Haxeltine [143] note, there is a strong emergence of community-based governing of sustainability transitions, operating in connected action-oriented learning networks. However, as Feola and Nunes [144] note from a transition town movement perspective, scaling up initiatives is complicated, and the impacts on climate change uncertain, hence the response from some social learning theorists to focus on intra, and inter-agency social learning at diverse levels [150].

4. Discussion

The multi-disciplinary range of articles from this review all contribute in their own way to develop a more expansive understanding of climate change, with an emphasis on learning. More pre-determined and instrumental approaches to addressing human behavior co-exist with more emancipatory and emergent approaches, with associated desires for different kinds of change [146,160]. In our review it was notable that there are many recent works emerging in the wider transformation 'quadrant', as people seek ways of creating a reflexive learning society capable of dealing with the deep seated cultural rifts, risks and uncertainties that characterise climate change.

The orientations reviewed all show 'movement' on the path to 1.5 C, albeit in slightly different ways. Overall, and important for progressing climate change related learning in a transformational context, is the need to make interests and purposes of learning more explicit:

> The science-oriented learning of the top left quadrant provides an authoritative basis in 'matters of fact' which can help anchor climate change debates in measurable / proven scientific terms. For such learning to be transformative in addressing denialism and post-truth politics, however, more innovative forms of communication [130] and accountability in what comes to be regarded as scientific 'fact' [132] are

needed;

The top right cell capturing policy-oriented learning directs learning at the collective scale, providing a 'roadmap' [128], which can be used to plan and to implement national and international collaboration and policies. The increasing focus on transdisciplinary research can be seen as a move towards more open-ended and potentially transformative policy - oriented learning outcomes [142,156];

The bottom left management and organisation-oriented learning emphasizes the relevance for organisations and businesses to organise themselves to address challenges such as climate change at intra and inter-organisational levels. Such multi-level approaches which appreciate the role of social learning demonstrate the transformative nature of this approach to learning [35,37];

Finally, the lower right transition/transformation-driven learning focuses on the role of learning in more emergent, reflexive and open system environments [48] with a strong focus on including multiple actors. Here there are signs of learning processes that can open up and foster dealing with conflict, cultural rifts, transgressions across boundaries and between world views, belief systems and institutions showing these as potentially important learning processes on the path to 1.5 degrees C [48,80,151,152].

When working with heuristics it is important to keep in mind that reality is much messier than what heuristics tend to reflect. The analysis of literature in this review suggests that, while all orientations of learning can contribute to change, the learning motives and approaches usually become more expansive, more inclusive and more complex, when moving from the upper left area towards the lower right. This is represented by the expansive 'waves' in Figure 2 below. The analysis also indicates that different learning orientations may co-exist in the same capacity building setting or learning program. In turn, this suggests that the areas of the quadrants are not mutually exclusive. For example, policy-oriented learning may include the relevance of science as is the case with the IPCC process, where a wide range of both science and increasingly, various approaches to information transmission and learning for transformative adaptation is encouraged [27]. Or for example, from an organizational-oriented perspective, one can enhance innovative organizational arrangements focusing on collaborative curriculum development among institutions and teachers [138]. Last, a transformation-oriented approach can emphasize the need for inclusiveness and co-production of actionable knowledge, which requires making use of authoritative forms of scientific knowledge together with 'other' forms of knowledge [154].
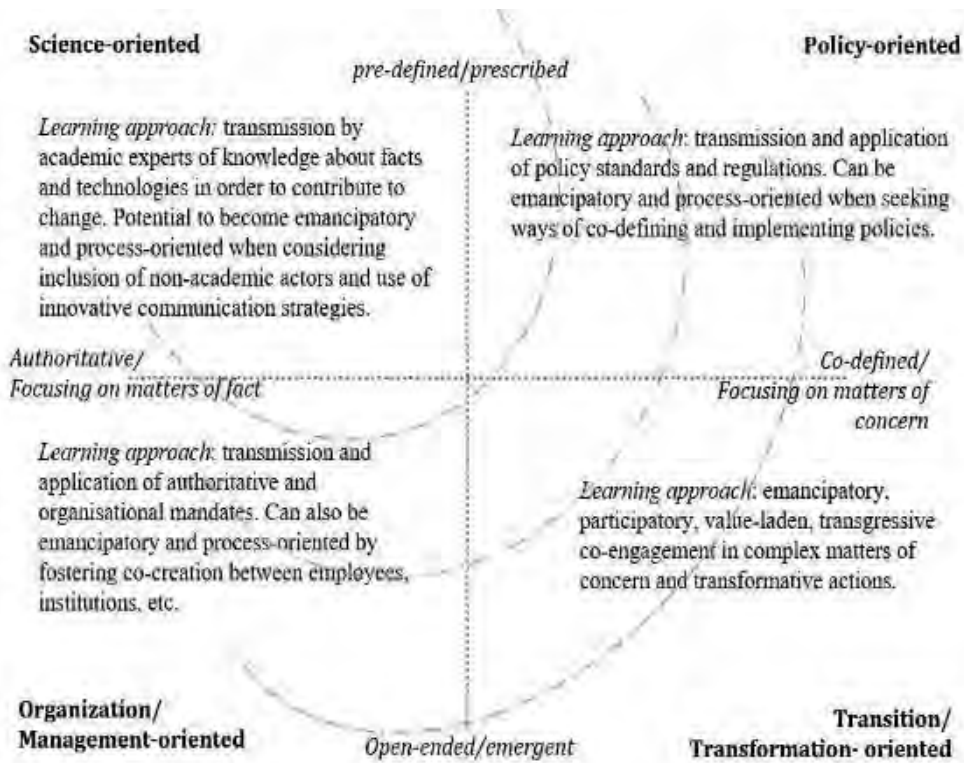
Figure 2. Learning orientations and approaches for change and transformation (Adapted from Jickling and Wals [33] and Dillon et al. [146]).

The fundamental differences infusing underlying assumptions among the learning drivers may also lead to tensions. Typically the language used in some climate change arenas relates to trade-offs and synergies, instrumentally calling for a change in behaviour. Even a strongly optimising, technical approach in the form of a "carbon law"[128] can be interpreted as a continuation of the status quo, based on the assumption that there is nothing fundamentally wrong with the growth mantra or the neo-liberal agenda. This can lead to a tension which is difficult to reconcile between *adapting* towards a 1.5 degree C world through anticipatory learning [36] and the need for *disrupting* the status quo through more 'deliberate transformation'[145] or 'transgressive learning' [48,80].

In some cases, rather than smooth transitions and discernable pathways to change, there may be a need for more disruptive, deliberative, and even transgressive transformations on the pathway to 1.5 C. In this light, Wals and Peters [161] note the importance of critically addressing our inbuilt cultural narratives and embodied ontological pre-dispositions, so as not to be blinded by alternative ways of 'seeing' and 'being' that may be more generative for sustainability. While there are some niches in all four learning approaches reviewed here that represent a more radical shift towards transformative orientations, they are somewhat difficult to find and may also be contradictory and in tension with each other (e.g. [27]). Here it is helpful to consider the advice of learning scientist Engeström [38] who suggests that tensions and contradictions are both helpful and important for *expanding learning* and change in human activity, and must therefore be confronted and embraced, not rejected.

Conclusion

This review has shown that diverse orientations to learning exist that address climate change concerns via a mix of instrumental and emancipatory approaches in various contexts. All of the papers reviewed here cohere around an interest in education and learning for societal change, with growing tendency towards more transformative social learning based on dialogue between diverse actors in open systems. This does not negate the importance of learning in other contexts, such as formal science education, policy engagement, or organisations. As shown across the papers, learning in all these contexts must be grounded in reflexivity and engagement with high quality knowledge that is derived from various ways of 'knowing', including scientific ones. This can be greatly helped through being inclusive, recognising multi-voiced perspectives, and enabling transformative agency to emerge at multiple levels. As shown via the heuristic, such 'knowing' resides in various contexts, including in formal education settings amongst the world's teachers, in organisations (intra- and inter agency settings), in multi-levelled policy contexts, and in social movements and wider social learning settings.

Assuming there remains some optimism in terms of reaching the 1.5 C target [see 162], there is by now a consensus that profound and far-reaching sustained change will be necessary to accomplish this. Moving from the top left quadrant towards the bottom left quadrant - from technical approaches and often pre-prescribed solutions towards emergent and multi-perspective approaches - appreciates that rather than quick technological fixes, transitions towards more sustainable futures takes time, contestation and negotiation, but in the end can help address the root causes of climate change and eventually profoundly contribute to curbing global warming.

Appendix 2:

Balancing the Warrior and the Empathic Activist: The Role of the Transgressive Researcher in Environmental Education

Abstract

This paper explores the complex relationship between environmental education and researcher activism from the perspective of transgressive learning. With increasing interest within academia for more radical learning-based transformations for confronting sustainability challenges, come calls for more instrumental *warrior* stances in methodologies and research fields so as to more aggressively change ingrained unsustainable behaviour at the societal level. At the same time, in an increasingly polarized and unstable world, there is also a desire for more *empathic* learning approaches so as to build critical thinking and empowerment at the grassroots level through emancipatory learning. Based on case study research of a Colombian network of sustainability initiatives, this paper argues that key capacities of reflection, empathy, and courage are imperative in order for the transgressive researcher to address deep-seated socio-ecological challenges.

Keywords: Transgressive learning, Environmental Education, Colombia, Activism

An introduction to learning and the status quo of sustainability

The status quo is nowhere more evident than in current sustainability debates. In times of global systemic dysfunction and impending ecological collapse, real change appears elusive. Quick fix technological innovations grab the headlines, while calls for fundamental changes to values and habits are met with institutional feet-dragging. Yet the fabled *Silent Spring* of Rachel Carson [163] seems just around the corner. Every day, in a country such as Colombia, we hear about new species dying out, tracts of native forest and cultural sites ravaged by mega-mining and Indigenous rights violated [164]. Perhaps more worrying than the silencing of Indigenous peoples and birds is the creeping realization that climate change—exacerbated by certain lifestyles—is making our planet increasingly uninhabitable not just for certain wildlife, but also for humanity. The further we consume our way into the Anthropocene—the epochal age of human induced climate change [165]—the greater the danger that we burn the ecological bridges which connect us to the web of life.

Not long after Carson's *Silent Spring* roiled readerships worldwide, the field of Environmental Education (EE) emerged as a response to environmental concerns such as the impact of chemical pesticides. Initially based on raising awareness and understanding about environmental values and behaviour (mainly in Northern discourse), the field has developed to incorporate political, social, cultural, economic, and gender-based considerations [11,160,166–169]. Although EE in higher education is steadily gaining traction in countries in the global South such as Colombia [170], it is the political branches of EE which have found especially fertile ground in environmental thinking and action. From the call for "soil, not oil" by Indian environmental activist Vandava Shiva in her book of the same name [171], to the demands of the Indigenous Zapatistas in southern Mexico for a "world where all worlds fit" [172], grassroots social movements that are deeply committed to environmental concerns are flourishing.

Alongside advancements in grassroots environmental activism are interesting developments in state level discourses in terms of group world views on the environment. Latin America is what Escobar (2010) describes as "the only region in the world where some counter hegemonic processes of importance might be taking place at the level of the State at present" [173]. In a bold institutional move, Ecuador amended its constitution in 2008 to declare the rights of nature. The following year, Bolivia declared itself a plurinational state, thus recognizing the coexistence of various nationalities within its borders [174]. Both constitutional amendments are affronts to modern paradigms of development, and are inspired by the emerging concept of *buen vivir* (roughly translated as *the good life*), which represents more biocentric, communal and relational means of understanding and being in the world [77].

What is becoming increasingly clear, however, is that providing information, raising awareness, or even institutionalizing nature rights is not enough to facilitate any major changes in human behaviour: There is a recognized gap between the stated desires/values of people and their everyday behaviour [175]. This can be seen in consumers' daily actions; for example, they may "green the world" through recycling, but they nevertheless fail to question some of their more fundamental (over-)consumptive habits. This gap is also evident at the state level, where despite the Ecuadorian constitution declaring the rights of nature, the government's recent approval of a mining law and the proposal of a water law arguably contradict the principles of *buen vivir* by placing economic development over the rights of nature [176].

Closing the gap between value and action is an important aspect of EE, and a fundamental consideration is the *types* of learning that are most effective in addressing current sustainability challenges. On one side are instrumental approaches based on changing human behaviour through, for example, education and government regulation. In a context of planetary upheaval, and societies' resistance to change, it is argued that we must use all available tools and means to change human behaviour before it is too late. On the other side are more emancipatory approaches which argue that societal members need to understand the system they are part of in order to be able to change it. Instead of the government or educational system taking the role of moving society towards predestined directions, the goal should be for educators to develop capacities for critical engagement with people, encouraging individuals to more actively reflect on actions and assumptions which maintain the status quo. This would facilitate personal and collective change (human development) within one's own socio-ecological context.

In environmental education, both approaches are used and can be combined, depending on what type of change is needed and desired [160]. Yet as learning specialist Arjen Wals notes, "deeper and more fundamental societal change will be more sustainable than quick fixes, short-term thinking and a focus on behavior without consideration of the deeper issues and values" [166]. Although instrumental approaches may well be needed to guide societies in a predefined direction, education promoting emancipatory learning has the potential to lead to a critical citizenry, one which questions basic assumptions. This in turn may lead to a greater planetary consciousness.

Environmental activism and the "transgressive" researcher

Based on the recognition that environmental activism is inherently value-based, we will explore the tensions involved in competing values through the two emotive approaches of the *warrior* and *empathic* activist. Employing the term *warrior* evokes different feelings in people depending on cultural context. Some Indigenous understandings, for example, highlight the deeply spiritual nature of the term. Alfred and Lowe note the English-Kanien'kehaka translation of the word warrior—*rotiskenhrakete*—literally means "carrying the burden of peace" of the Indigenous Kanien'kehá:ka/ Mohawk peoples of North America [177]. This definition starkly contrasts those that emphasize the warrior's qualities of power and strength that are apparent in Western dominant activism. The rubber dingy filled with black-clothed activists racing to cut off a whaling ship is a good example of the against-the-odds "fight"— raising short-term public awareness of an environmental issue. We can understand the Western approach to activism, replete with a touch of hubris, as taking the side of more instrumental approaches to learning as it seeks to change behaviour through predetermined ideas of what is right or wrong. It is in this Western sense that we will use the term warrior in this paper.

By contrast is the *empathic* approach to activism, characterized by qualities of care, nurture and empathy, and perhaps tinged with a shade of naivety. A good example of empathic activism can be found in the Salt March of 1961, led by Mohandas Gandhi, whose non-violent, symbolic opposition to the British crown galvanized India's resistance movement. Such activism has the potential to change perceptions in societies about what is possible or not (in this case, defying the British Crown), whereby the ability for the masses to connect with a cause can lead to a more emancipatory approach to activism and learning.

It is important to note that both warrior and empathic approaches are useful and valid in particular contexts: after generating international awareness to India's fight for independence, Gandhi then had to sit down at the negotiation table with instrumental demands for the British. The question we want to address in this paper is: *how,* in the context of sustainability challenges, do these approaches generate tensions and contradictions in the researcher and subject, especially in terms of addressing sensitive topics such Indigenous rights, sustainable lifestyles and, ultimately, world views and ontologies?

The rest of the paper is structured around five characteristics of the emerging concept of transgressive learning, which we will use as a means of addressing the question that closed the previous paragraph. This will be explored via case-based studies and experiences from four years of research into a Colombian network of sustainable initiatives called CASA (The Council of Sustainable Settlements of Latin America). The respective characteristics repre-

senting each section are as follows:

1. Ethics of transgressive learning is based on a philosophy of caring which balances the *warrior* stance of activism with the *empathic* pose of vulnerability.
2. Transgressive learning, based on disrupting structural hegemonies of power, is a form of transformative learning.
3. Transgressive learning addresses *wicked* sustainability issues characterized by their complex, fluid, and transient nature.
4. Transgressive learning as a methodology is normative and characterized by "ecologies of knowledge."
5. With their emphasis on participatory, reflective and narrative approaches, transgressive methods are performative by nature.

Within each section, we will describe the characteristic, place it within current research in Colombia and discuss the role of reflection, empathy, and courage, in what we describe as essential aspects of the transgressive researcher. We will conclude this paper with some final remarks on what a not-so-silent spring may look like for all of us.

Characteristic 1 - Ethics of transgressive learning are based on a philosophy of caring which balances the warrior stance of activism with the empathic pose of vulnerability.

Change seems to be the talk of the town. After millions of years of incremental geological changes—with glaciers emerging and receding, and continents meandering across the seas—the human footprint is dramatically affecting the rate of change on Planet Earth. The sheer extent of this footprint is not only accelerating human progress, but also hastening planetary changes, ushering in what some are labelling the new geological epoch of the Anthropocene [165]. The advent of the so-called Anthropocene raises profound ethical questions about humanity's relationship to the natural world, and how we should move into the future [178].

This is especially true when taking an advocacy approach to, and participatory stance on, research—when trying to give research subjects a political voice and facilitate and promote positive changes in their lives. Researchers must ask themselves, do we do this through an empathic pose? In other words, do we take the form of a reflexive and sensitive practitioner who is *empathically* versed in engaged practice - an approach that is able to facilitate participative parity within social learning spaces that are often aimed towards the sensitive areas of justice and emancipation [179]? Or, do we instead risk tension and conflict by questioning and challenging what we see around us? In other words, do we take a *warrior* stance following the dissonance and seek opportunities for personal transformation and even collective transgressive learning (Chaves et al., 2016)?

Before adopting an activist role, one must consider the fundamental ethical responsibility of the researcher to "do-no-harm." For how can we break hegemonies of power without causing tension and conflict between and within the people and communities we study? For example, when searching for an interesting topic of research, the second author of this paper clearly remembers the suggestion of her supervisor: "Go where the conflict is!" And indeed, this present research has found that conflict and dissonance are fruitful avenues for exploring disruptive pathways that lead to transformative and transgressive learning-based

change. In the words of co-researcher Jorge Calero, "transformative fires" maintain the activities of the community dynamic [180]. Yet how can we square such a *warrior* attitude with a planetary need for cultural and ecological reconciliation?

Addressing this dilemma, McGarry et al. [181] have put forward the idea of expanding moral action to move beyond "do-no-harm" and towards a practice of care. Through positioning the researcher as a "reflexive justice practitioner" [182], and an "empathetic apprentice" (McGarry, 2014), an ethical framework based on the practice of care situates moral action and ethics as an ongoing dynamic relationship between the researcher and actors—both human and non-human. In practice, this ongoing relationship demands substantial reflection by the transgressive researcher. A fundamental (though disconcerting) consideration is whether the researcher is addressing the problem, or is part of the problem itself. Paraphrasing David Orr, the people with the biggest ecological footprints are not the ones who received no formal education and are living in poverty but are the ones with undergraduate and graduate degrees [183]. As educated researchers, we have both a comparatively high awareness about sustainable development and a highly unsustainable lifestyle that is at odds with intergenerational global, social, and environmental justice.

As a means of addressing this ethical paradox, the authors of this paper lived among the members of the ecovillage Atlántida, located in southern Colombia (see [180], joining them in a life characterized by voluntary simplicity. In a small, 12-square meter house with a dry toilet, situated in a stunning rural setting and embedded in a community fabric of chores and celebrations, we tried to live a form of *buen vivir*—a life connected to the natural world—leaving as small a footprint as possible. Despite temperamental electricity, mediocre internet, and infuriating outbreaks of lice, we managed to create a life in spite of community turmoil. But consistent with the wicked nature of sustainability challenges, our situation changed as new factors emerged, thus rendering this life untenable for us. These lived and embodied experiences, however, proved invaluable for highlighting the importance of having the courage to step off the beaten path, confront other ways of living and being, and put into practice being a critical, reflexive and engaged transgressive researcher.

Characteristic 2 - Transgressive learning, based on disrupting structural hegemonies of power, is a form of transformative learning.

At the conceptual level, the surging awareness of the damage humans are doing to our ecological home, and the need to do something about it, has led to increasing discourses of transition [184]. A popular example of a collective transition discourse is that of transition culture, based on the empowerment of grassroots communities to address peak oil and energy use [185,186]. In research policy, this has been framed as socio-technical transitions [64] which notes that sustainability is difficult to achieve because of lock-in mechanisms that maintain poverty and social injustices; it posits that radical sustainability innovations instead occur in niches. At the individual level, there is also an increasingly strong focus on personal growth, empowerment and self-help literature, which from a learning perspective, is encapsulated by the theory of transformative learning. With a frequent focus on cognitive and personal change, this theory promotes the importance of transformations in beliefs, values and points of reference [187].

Building on the numerous "T" terms of "Transition," "Transformation" and "Transgression," is the research project titled "Transgressive Social Learning for Social-Ecological Sustainability in Times of Change" (referred to as the T-Learning project). Funded by the International Social Science Council, this international multi-case study project aims to investigate the "emergence and qualities of transformative, transgressive learning processes and their role and contribution to sustainability transformations at the food-water-energy-climate-social justice nexus" [188]. This project is based on the recognition of the important roles of education and learning in leading human development and societal transformations [126]; it is also rooted in a belief in the importance of more radical forms of learning-centred transformation [189], which, as the Intergovernmental Panel on Climate Change (IPCC) [190] reports, is strongly needed for climate change adaptation.

Characterized as a form of transformative learning that addresses structural forms of power, transgressive learning is a "concept in construction" based on exploring the *types* of radical learning that have the potential to disrupt ingrained norms of unsustainability [188]. As one of nine case studies from around the world, the aim of the Colombian case study is to explore the stream of transgressive learning characterized by new social movements, postcolonial and decolonization theory. It builds on the authors' investigation into the sustainability network CASA Colombia [191], an intercultural organization made up of ecovillages, Hare Krishna devotees, Indigenous communities, and urban professionals. CASA is actively working to create intercultural learning spaces, where shared sustainability challenges such as mega-mining, food sovereignty, and territorial defense are addressed.

An inherent tension in this research has been between the "aggressive" nature of transgressive learning—confronting basic assumptions of inequality and environmental degradation in society—and the need for understanding and respect for other worldviews and realities. As a form of collective learning, transgressive approaches require substantial reflection on what structures should be disrupted, how learning can contribute to such disruption and, importantly, the consequences for people and the environment of changing the status quo. For although it takes courage to confront the system, empathy is also vital for recognizing that even if disruptions may be necessary, they will always involve uncertainty and pain for those who are not ready to change.

Characteristic 3 - Transgressive learning addresses **wicked** *sustainability issues characterized by their complex, fluid and transient nature.*

The uncertainty referenced in the previous paragraph has led policy makers and academics to employ the term "wicked" to describe the quagmire of the sustainability concept [192,193]. Rather than single, all-encompassing solutions to resolving sustainability challenges (for instance, technological development), there is an increasing understanding within sustainability circles that multiple perspectives and types of knowledge, worldviews and strategies are needed to address interconnected nexus challenges such as food sovereignty, social justice, water and energy needs.

The complex nature of wicked sustainability challenges suggests that a routine problem solving approach is insufficient, as the effort to reduce the problems of the world into smaller, manageable chunks negates the interconnected nature of the world. Instead, it is argued, we need more systemic and reflexive ways of understanding our ever-changing environment.

Wals et al. [160] note, however, that critics of such an emancipatory view argue that we already have a good idea of what is sustainable or not, and by the time we have all gone through the process of self-emancipation, it will be too late.

Our research has shown that although society may have a somewhat shared understanding of what is sustainable at a discourse level, day-to-day realities in situated contexts are far more nuanced. Research into the ecovillage Atlántida—a member initiative of the network CASA—has shown that even in a seemingly homogenous community of people intentionally living together to fulfil shared visions of sustainability, tensions and dissonance were generated over time on account of differences in worldviews, work rhythms and sexual practices [180]. From a flourishing community of over 20 people, this community ultimately collapsed. Through collective reflection sessions, remaining residents acknowledged that their original visions of living a communal and harmonious life had changed over the years, and due to a lack of communication and emotional management, these differences had unwoven the social fabric of the community.

From a researcher perspective, it was enlightening (though tough) to research and be part of the Atlántida community. On one side was the strong *warrior* feeling of being part of a community outside of mainstream norms and society. We were activists, courageously fighting the system not only through talking, but also through walking the path of sustainable living. Such resistance to modern conventions involved relearning how to live with the cycles of nature, and opening oneself up to processes of personal growth and spirituality. It also involved the fickle challenges of living *together* with people in a community—of confronting the dominant narrative of individuality. Although romantic at times, this *warrior* approach proved problematic. Like the example of the Greenpeace activists up against a giant whaling ship—of David versus Goliath—this type of activism reinforce the dominant divide between *warrior* activists and the population at large.

In many ways, communities such as the ecovillage Atlántida represent an ideal, though unattainable, way of living in harmony with Mother Earth. The experiment of the ecovillage Gaviotas, in the eastern savannas of Colombia, further demonstrates the challenges of such initiatives. Gaviotas comprises a group of engineers and scientists who have attempted to create a model of sustainable living [194]. Despite multiple innovations such as hand pumps capable of tapping deep sources of water, and a massive reforestation project, maintaining a long-term community in the face of complicated political and social realities has proven difficult, and Gaviotas constantly faces an uncertain future.

Rather than fighting the system, our experiences have demonstrated the importance of empathic forms of activism, whereby sustainability is viewed as a process-oriented negotiation between ways of being in the world. Although a "sustainable ecovillage" sounds powerful in a report, we consider it impossible in practice. What appears more attainable are the capacities of critical self-reflection, as well as the ability to empathize with fellow human and non-human actors. To the transgressive researcher, such decolonial perspectives place a great focus on experiential learning, where ethical engagement and theoretical stances are embodied in practice [195]. With respect to experiential and process based learning, we thus need to be careful not to label initiatives such as the community Atlántida and Gaviotas as "failed." Although the original community of Atlántida collapsed, such experimental spaces are an inspiration to many people who visit and live for periods of time in these communities, such as the authors of this paper. In the case of Atlántida, new people are moving

to the community with new ideas and skills, demonstrating an organic process of death and rebirth.

Characteristic 4 - Transgressive learning methodology is normative and characterized by "ecologies of knowledge."

Building on the need for multiple perspectives and types of knowledge, the T-Learning project is co-designed [188]. It seeks to explore transgressive learning *in situ* across cultural contexts. Methodologies focus on transdisciplinary research, with an emphasis on boundary-crossing academic, civil society, government and even non-human realms [196]. Its epistemological basis is on "ecologies of knowledge" [197], which focus on establishing cognitive justice between modern and non-modern worlds. The general goal is generating and contributing to new or marginalized narratives of sustainable good lives. Such narratives have the potential to represent innovative "keys" for helping to unlock the nexus challenges mentioned earlier in this paper. In this way, transgressive learning is explicitly normative—it challenges taken-for-granted social norms.

In this section we discuss the ontological aspect of activism arising out of the Colombian case study. As noted by Lotz-Sisitka [198], ontology plays an important role in EE, influencing how and why we come to particular forms of research. It also provides a reflexive referent for our epistemic endeavours, i.e., it helps us to understand that our *thoughts* about being may not always be the same as *actually* being. This is significant for the activist researcher because it brings into sharp focus the oftentimes epistemic and ontological disjunctions of politics, forcing us to consider the meaning of ontological politics anew, i.e., compelling us to examine the politics of being. Moore [199] proposes that ontological politics of modern world history may be typically and incorrectly cast as "a history of relations with environmental consequences." Through review of four decades of environmental thought, Moore proposes to counter this, suggesting that a new framing of such politics is possible : "modernity does not only act *upon* nature, but develops *through* the web of life" (p. 9). The object of modern crisis is therefore "a relation of organising and reproducing life, power and capital"—all of our activity *is* "environment making" (p. 9).

The methodological considerations of the performativity of ontological politics became apparent through the authors' active participation in the 2015 gathering of the CASA network called *El Llamado de la Montaña* (The Call of the Mountain). This took place in the Indigenous University of Misak in the southern Colombian territory of Guambía. Central to the cosmology of the Misak people is the notion that the territory is alive—that it is living and breathing. Living a *buen vivir* means harmonizing relations between territory, the community and oneself. Many participants of this intercultural event were challenged by such an ontology, instead embracing a more modern ontology—one that is far removed from daily relations to spirits, territory, and energy levels. To demonstrate these otherworldly encounters, we provide a narrative of the harmonization ritual the Misak medicine men conducted to cleanse participants for the territory:

> *"Late in the afternoon, the cleansing of participants was programed. Participants were asked to sit in a horizontal line behind a group of medicine men who were "speaking" to the territory. Without explanation, people accepted the situation and waited for something to happen. After two hours nothing had "happened." The*

medicine men stood gazing out into the mountains, whispering softly to the wind, while participants began to feel cold, tired and bored...Eventually a thick mist began descending from the mountains enveloping everyone, further decreasing the temperature and silencing the singing. Many participants, tired and cold, started leaving for their tents. At last, a medicine man explained that the mist was the actual cleansing. He brushed each person front and back with a branch soaked in water infused with medicinal plants. The ritual was over; the remaining people stumbled back to their tents in the dark, some confused, some contented, and most just ready for bed." [80]

As Moore (2015) points out, the translation of the philosophical position that being in the world is an environment-making process requires care and development in terms of methodological premises, narrative strategies and theoretical frames. The above narrative demonstrates some of these considerations for the transgressive researcher. First, the premise that there are "other" worlds—in what some academics describe as the "pluriverse" [see 200]— demands the researcher to remain open-minded, accepting that although we may not be able to "see" or understand other worlds, they still exist. This may sound poetic, but as the anecdote demonstrates, there are politics in these encounters which are not always so comfortable or understandable. A *warrior* approach to investigating these other ontologies, and judging them, risks the reflexive pitfalls of thinking that we actually understand them. Perhaps more useful, though much less definite, is a more *empathic* approach, which requires a relational, critical and transgressive style of ontological politics. This is emergent in a type of research that is experiential and reflexive as an environment-making process in the web of life. Sometimes, as researchers, we need to have the courage to sit back and acknowledge that we do not understand what is happening; we need to accept that we are part of the web of meaning being performed by a multitude of actors, of which humans only make up a very small part.

Characteristic 5 -**With their emphasis on participatory, reflective, and narrative approaches, transgressive methods are performative by nature.**

A recurring theme in the sections above is the notion that social life is performative, or "environment-making," as Moore [199] describes it. This complements the increasing skepticism in the postmodern world regarding the objectivity of the researcher, the generalization of knowledge claims, and the naive realist agendas where the researcher is put above the subject and the method is prioritized over the subject matter [201]. This is nowhere more clear than in the field of methods, where authors such as Law [202] argue that methods do not just describe social realities, but help make them. This highlights the *performativity* of the researcher, where, through our researcher narratives, we are producing storied performativity [203].

Method deals with how the researcher goes about collecting the information which constructs these stories. In this respect, knowledge co-production is an important aspect of the T-Learning project—and not just as co-designed research, but also in terms of creating knowledge *together* with research subjects. In the Colombian case study in Atlántida, we embraced Participatory Action Research (PAR) so as to become part of the social lives of the study. Beyond action research as a method, Fals Borda [204] emphasizes the added par-

ticipatory involvement of the researcher in what he describes as "praxis-inspired commitment," whereby the researcher goes through a process of decolonization from the dominant expert-based institutional logic, and assists intellectual and political movements for people's self-reliance and empowerment.

In the case of Atlántida, researchers attempted to adopt this method through joining the community as residents and partaking in active decision making processes, while at the same time upholding their role as researchers. An important result of this approach was the willingness of two of the residents to become co-researchers. These community members wrote reflections on their life in the community, one of them conducted interviews with other community members, and both contributed as co-authors to the publication of a peer-reviewed article [180]. This was rewarding to us as researchers, as it provided a real means of including the community members in the knowledge we were generating. However, in line with what Gottlieb [205] and Maxey [206] note, research collaboration is problematic in practice and in terms of representation. Apart from the challenges of one of the co-researchers not speaking English, which necessitated much document translation, a fundamental question was the extent to which the end product of the journal article represented the views of the co-researchers. The written reflections by the co-researchers had to be woven into the article, with changes in translation as well as content resulting as word limits had to be respected and main arguments refined. One co-researcher was skeptical about whether the changes maintained her intended meaning, and she communicated feelings of disappointment about having her words bent to fit the article. The two lead authors sat down with the co-researcher, listened to her concerns, and explained how her ideas and written words had been incorporated to support the main argument of the paper. Small changes suggested by the co-researcher were then made to the manuscript to reflect some of these concerns. Conversely, the other co-researcher displayed little interest in the representational process.

The representational process highlights the tensions inherent in the beautiful concept of "knowledge co-production." Breaking with the objective expert as the sole owner of knowledge, more horizontal forms of knowledge production have a strongly activist feel about them, suggesting empowerment and emancipation for often marginalized groups in a society. It is important to remember, though, that research and social life are inherently performative, which means they are also political because of the power relations they enact. The presence of power relations demands the strong ethical consideration that if we are influencing specific events through *what* and *how* we research, then we have a responsibility to help create the realities we want to realize. Acknowledging these power structures and responsibilities takes courage and demands reflection on the part of the transgressive researcher. It inherently involves balancing the fine line between disrupting ingrained unsustainable habits and caring for the relationships that give meaning and happiness to our lives.

Conclusion: a not so silent spring

The greatest challenge facing humanity is taking responsibility for the way we are treating Mother Earth. In many ways, those arguing for a more *warrior* stance to learning are correct when they say that most of us know that our lifestyles are unsustainable, and that we are running out of time. We *are* running out of time, and although emancipatory approaches to

empathic learning appear to be more just and liberating, there appears to be a good chance that it will be "too little too late." On the other hand, history has shown the tyranny of fear-induced power, and the prospects of an eco-totalitarian regime are not for the faint hearted—massive programs of "rewilding," for example, where people are contained in mammoth techno-cities (happy or not), while nature is left to *be* nature [207].

This paper has dealt with the importance of reflection, empathy and courage in the transgressive researcher so as to better understand and *act* within the complex dynamics of current socio-ecological challenges. Yet, as we have attempted to demonstrate, we are *all* activists in that we shape and perform the world in our everyday actions. As a collection of activists, we have, however, reached a turning point in our history where we have to make a change to survive. If we do not make these profound and surely painful changes to our habits—if we do not learn from our mistakes—then perhaps the following spring will *not* be so silent.

In his book titled *The world without us*, Alan Weisman [208] provides an account of a world where dampness and frost are breaking up the concrete jungle of New York. Seeds blow in with the wind, finding space in crooks and crannies, sprouting in newly forming humus, and growing into trees. Coyotes, wolves and bears re-enter the city. Slowly but surely, Nature, with all its noise and charm, will reclaim the domains which humans temporarily inhabited, but in which they are now no longer a part. This is a surreal image, and on one level it is a little sad. On another level, however, one can accept that this is just the way Nature works. This is the web of life taking its natural course—one in which our time as a species has come to an end.

Appendix 3:

T-labs and climate change narratives: Co-researcher qualities in transgressive action–research

Abstract
This paper addresses the call for more action-based narratives of grassroot resistance to runaway climate change. At a time when deep changes in society are needed in order to respond to climate change and related sustainability issues, there are calls for greater connectivity between science and society, and for more inclusive and disruptive forms of knowledge creation and engagement. The contention of this paper is that the forces and structures that create a disconnect between science and society must be 'transgressed.' This paper introduces a concept of Transgressive Action Research as a methodological innovation that enables the co-creation of counter hegemonic pathways towards sustainability. Through the method of the Living Spiral Framework, fieldwork reflexions from the Colombian case study of the international T-Learning project were elicited, uncovering and explicating the transgressive learning qualities needed to respond to climate change. As part of a larger action-research project, this paper combines the arts with the social sciences, demonstrating how the concept of 'Transgressive Action Research' can enable co-researchers to engage in disruptive and transformative processes, meeting the need for more radical approaches to addressing the urgent challenges of climate change.

Introduction

We are at a historical point in time where as a human race we are burning the ecological bridges which connect us to the life sustaining veins of the earth [30,209,210]. With overwhelming scientific consensus that humans-based actions are exacerbating climate change, and the daily reminders of hurricanes, floods, drought and soaring temperatures, it is the question of our time as to why the status quo remains so stubborn when it is based on such an unsustainable paradigm.

Part of the reason for this stubbornness or 'maladaptive resilience' [48] is the contentious nature of the climate change debate, whereby various perspectives are saturated with deep seated values and ingrained structures. Although most people recognise the increasing detrimental effects of climate disruptions, there are various structural barriers to realizing change: strong economic interests that maintain the growth paradigm; poverty and inequa-

lity leading to social injustice; as well as the deeper western worldview which sees nature as separated from Man, and hence as a commodity to be exploited.

At the center of this debate is the question of how to reconcile the seemingly mutually exclusive realms of the need for society to collectively move towards more sustainable solutions, and individual interests which do not [211]. On the one side, there are technical and policy level approaches to transforming society at the collective scale [128]. On the other side, there are calls to work through 'deliberative transformation' at the personal level [145]. There is also the tension between learning to *adapt* to inevitable climate changes, and longer-term learning to *transgress* unsustainable worldviews and values so as to move towards more ecologically just and socially prosperous futures [161]. The former leads to calls for adaptive capacity building and making communities more 'resilient'[212] , while the latter calls for disruptive capacity building and making communities more agentic and activist [80].

With the urgency of addressing climate change and its root causes remaining, there is a need to find ways to involve individuals and communities in meaningful forms of climate action. Given the contested nature of climate change responsiveness, the high levels of complexity and ambiguity surrounding climate change adaptation, meaningful engagement by the public becomes challenging. One way of addressing this is through communicating the bigger picture of climate change through personalised stories [130], whereby local experiences and narratives are connected to foster the systemic change needed for sustainability transformations. Connecting local practices with wider paradigmatic changes fits in well with the call for new understandings between knowledge and action and the associated need for new approaches to research [213].

A field of research which addresses the knowledge-action gap is action-research, which broadly speaking includes scholarship-practice with a focus on multi-stakeholder engagement and a change agenda [16]. Action research is centered upon the simultaneous development of thinking and acting through continuous 'reflexive' spiralling, moving towards a new state that is more desirable than the one before, according to the criteria established by those involved [97]. Action research can open up more inclusive communicative spaces among communities of practices which, in the context of sustainability, need to break through the historically rooted, paternalistic and unequal relationship among communities and, indeed, species, in order to generate change [214]. It is argued that it is by moving beyond, and by interacting in between, the boundaries of different communities of practices, that actionable knowledge for reaching sustainability outcomes can emerge [215].

Taking the above characteristics of action research into consideration, this study contends that unsustainable values and norms must be disrupted and even 'transgressed' for alternative worldviews and practices to emerge. Doing so is especially important in the realm of science which, even though it is suffering from a the decline in public trust, remains a powerful actor necessary for socio-ecological transformations. Critical in action research, as well as in the emerging field of learning for sustainability, is the notion of reflexivity which can be described as a continuous alertness and willingness to think, rethink, adapt, abolish and to learn [216]. Since climate change solutions are highly contextual and temporary, as a result of widely different and changing socio-cultural and geo-physical circumstances, the search for viable and just interventions inevitably requires such reflexivity.

The overall purpose of this paper then is to connect action research to the emerging stream of reflexive and disruptive 'transgressive learning,' putting forward the case for an emerging stream of transgressive action research (TAR). The questions we are trying to answer are: What are the key characteristics of TAR? And what are the key qualities needed for TAR co-researchers? This paper presents fieldwork reflections from the Colombian case study of the international multi-case study project called 'Transgressive Social Learning for Social-Ecological Sustainability in Times of Climate Change' (acronym T-Learning). Within the T-Learning project, the Colombian case study discussed in this paper focuses on exploring narratives of learning-based change in the framework of climate change, through Transformation labs (T-Labs). The first section of the paper weaves the strands of transgressive learning theory with Participatory Action Research (PAR), making the case for TAR as a contribution to the field of action research, presented in a table. Section two explains how the TAR methodology was established in the Colombian case study through involving co-researchers employing T-Labs in their own initiatives; Section three is based on reflections from co-researchers on what it entails to be a co-researcher in transgressive research, triggered through employing the method of the Living Spiral Framework [66]. Section four presents an analysis of co-researcher narratives, based on thematic coding, whereby a table is presented of co-researcher qualities needed in TAR. Section five discusses these qualities in light of TAR, concluding with how TAR can help address climate change challenges.

Section 1. Transgressive Action Research

Beyond the basic science of human-induced climate change, increasing importance is being placed on the role of *learning* in addressing climate change [27]. Learning in relation to climate change comes in many forms, from science and policy oriented learning, towards learning more focused on organization and social transformation [32]. Since climate change is considered a wicked problem that requires the breaking with stubborn routines forms of learning that are more reflexive, critical and transformative are seen as particularly promising [161].

The ISC funded T-learning Transformative Knowledge Network, has the objective of researching the emergence and qualities of 'transgressive' learning processes and their role in contributing to sustainability transformations at the food-water-energy-climate-social justice nexus. Transgressive learning can be characterised as a form of transformative learning (see Mezirow [187] in that it involves the introduction of, or exposure, to disruptive events that can trigger transformations in firmly grounded beliefs, values and points of reference. Transgressive learning specifically addresses the disruption of structural hegemonies of power by exploring *types* of radical learning which have the potential to transgress ingrained or normalised norms of unsustainability [12,48,80,166,188]. Bringing these different characteristics together, and recognising the difficulty of generating definitions which various people can identify with, the T-Learning team has co-defined T-Learning as *a regenerative, conflictive and hopeful process which involves diversity and drives changes in stubborn cultural practices and identities for sustainability, and triggers change for sustainability in times of (dis)comfort at different levels, scales and in spaces" [14]*. Transgressive learning is also strongly related to social learning (see Wals [111] in that it emphasizes the importance of co-learning, relationships, and the roles of diversity and flexibility in responding to challenges and disturbances.

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An important consideration in transgressive learning is acknowledging that transformations towards sustainability do not come about easily because of lock-in mechanisms and path-dependencies which maintain, for instance, poverty and social injustices. Radical innovations tend to first occur in the margins of the mainstream in so-called 'niches' where people dare to experiment Geels [64]. The Colombian case study that is central to this paper can be considered such a niche. Participatory Action Research (PAR) is used as a guide to explore this niche, which has a strong tradition in Latin America through the work of people like Fals-Borda [17,217] and Streck [218]. Fals-Borda [17] emphasises the added *participatory* involvement of the researcher in PAR in what he describes as 'praxis-inspired commitment' whereby the researcher goes through a process of decolonization from the dominant expert-based institutional logic, and instead assists intellectual and political movements for people's self-reliance and empowerment. PAR challenges the positivistic approach to science based on knowable truths, control and authority and rejects a neutral stance to research, highlighting the subjectivity and relationship between researcher and subject [85]. The notion of decolonization from the dominant expert-based institutional logic can be seen as disruptive which makes PAR compatible with the transformative and transgressive learning approach introduced earlier.

Due to its inclusive stance to multiple stakeholder perspectives, PAR is a challenging approach to research which requires great sensitivity by the research coordinator in forming a real and meaningful collaboration, as well as time and organisational commitment. As Klocker [219] notes, PAR can be a very emotional experience, putting a lot of responsibility on the PAR team leader, with Maguire [220] also pointing out the challenges in terms of workload and funding. A strong tension in PAR is also the conceptual adjective *participatory*. Alejandro Leal [95] notes how the concept of participation emerged as a form of radical social transformation in the face of neoliberalist capitalism, but how the concept has been co-opted by institutions deeply entrenched in the status quo, resulting in the word becoming a buzzword used when working with different actors, but of whose deeper philosophical meaning has been diluted. Although the PAR methodology is sensitive to the complex relationships between researcher and subject, such as stakeholder versus researcher needs [221], there are deep structural inequalities which can be glossed over through the use of the concept participation. So as to be a counter-hegemonic methodology of and for the margins of society, Jordan [96] suggests PAR practitioners draw on other critical methodologies thus forging alliances with other research communities.

Taking up this challenge, this paper brings together the two strands of PAR and transgressive learning to put forward the concept of Transgressive Action Research (TAR). The deeper meaning of transgression - both to go against and to move beyond - implies exploring the less certain, changing and intangible forms of knowledge and power relations. Earlier work has demonstrated how creating 'niche' spaces for encounters between diverse actors can create environments for transgressive learning, whereby disruptions caused by the encounters of difference have the potential to change the way we understand and shape the world around us [80]. The concept of transgression adds to action research the quality of moving towards the boundaries of what is commonly accepted and understood, being open to the unexplainable and unknown. We can thereby define TAR as *a shared commitment to fundamentally disrupting conventional onto-epistemologies through action-based research, decolonising our ways of engaging with the world through embodied experiences of encountering the unknown and unknowable*.

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In TAR, knowledge is generated through reflections of embodied experiences by co-researchers, based on day-to-day practices, with a special emphasis on the co-researcher being critically aware of their dual roles of community member and researcher. Similar to PAR, the TAR approach involves an iterative journey of reflection and action by researchers, which engages in understanding why things are the way they are (current state), what keeps things from changing (maladaptive resilience), how things should be (more desirable state). Peters and Wals [98] refer to this process as phronesis but at its core is connects with Kurt Lewin's original work on action research [222]. Rather than being an orderly, *cyclical* process of action-reflection-action-reflection, however, TAR involves a *spiralling* process of learning-based change, which recognises that we are simultaneously researching transformation while undergoing transformation ourselves (see figure 1 below for a comparison of PAR and TAR). As has been represented in earlier transformative research [97] the spiral metaphor captures the reflexive learning journey of the researcher, where TAR emphasises the need to move beyond boundaries, opening up to the inexplicable and unknown. As a means of embodying these changes, a defining aspect of TAR is that one has to live the transformation to understand it, and the need to explore how to 'transgress' comfortable paradigms of how we understand the world, acknowledging the hidden nature of much knowledge.

	Participatory Action Research	Transgressive Action Research
A key focus	A praxis-inspired commitment whereby the researcher goes through a process of decolonization from the dominant expert-based institutional logic, and instead assists intellectual and political movements for people's self-reliance and empowerment (e.g. [17])	A crisis-inspired existential shared commitment to fundamentally disrupting conventional hierarchies in order to facilitate knowledge production through action-based research, decolonizing our ways of engaging with the world through embodied experiences of encountering the unknown and unknowable.
A key process	A cyclical iterative journey of reflection and action by the (co-)researchers, which engages them in understanding why things are the way they are (current state), what keeps things from changing (maladaptive resilience), and how things should be (more desirable state, also referred to as phronesis [98]	A spiralling process of learning-based change, which recognises that we are simultaneously researching transformation while undergoing transformation ourselves. Through reflection cycles we never end up at the same place as where we started, and there will also be invisible processes and absences that are often unexplainable/unknowable.
A key limitation	Because of its focus on participation, there is a danger that underlying tensions and paradoxes are not addressed in the research collaboration between lead researcher, co-researchers, and research subjects. (e.g. [95]	Because of its focus on research tensions and paradoxes, it is difficult to justify this approach in traditional learning contexts which focus on measurable indicators and clear results for evaluation purposes.

Figure 1. Key characteristics for Participatory Action Research (PAR) and Transgressive Action Research (TAR).

Section 2. Setting up the TAR methodology in the Colombian case study

A defining characteristic of this investigation has been the close collaboration between the authors of this paper. The first author, in his present capacity as lead researcher, began collaborating with co-authors two, three and four in 2012 while researching an organisation of sustainability initiatives called CASA Colombia [see 79]. Through a PAR methodology with an emphasis on reflexive/action learning loops, this research involved itinerant processes of triple loop learning [78], participant methods of exploring visions and practices of sustainability in CASA initiatives [77] and reflective writing through auto-ethnographic research into CASA network gatherings [see 80]. Through this collaboration, trust and shared purpose developed to the point where the lead author of this paper invited the before mentioned co-authors to join the T-Learning team as co-researchers (not research subjects as before) to investigate the transformations taking place in their own initiatives within the framework of the T-Learning project. Co-authors five and six are outside scholars who have reflected on the work, and contributed to the writing in the final stages of this process.

Codefined definition of a T-Lab

One of the important contexts of the T-Learning project has been T-labs (Transformation Laboratories), which bring together diverse actors working at the nexus of socio-ecological challenges. Emerging from the area of social innovation [see 223], T-Labs have been used in academic arenas such the Resilience 2017 conference (www.http://resilience2017.org), as well as the transformations conference, 2017 (www.transformations2017.org). T-Labs form an integral part of the T-Learning project as spaces and processes of action and learning-based transformation, and form an integral part of the TAR approach. T-Labs are necessarily context-based and thrive on innovative design, planning and facilitation. Because of the strong organic process, however, it was necessary to co-define what T-Labs are in the Colombian T-Learning case study. Through a dragon-dreaming exercise of collaborative definition making [224], we reflected on what different T-Learning terms mean, coming up with our own co-defined definitions. The following is a co-definition of a T-Lab: *"T-Labs are pedagogical spaces and processes of restoration and potentialisation of sociocultural tissues in territories. They are developed in living, diverse and intercultural learning spaces giving new reference points and regenerative tools."* [see 225 for more information on this process]. The following is a brief explanation of each of the three T-Labs processes, located in different areas in Colombia, described through the voices of the respective co-researchers/co-authors. The lead author of this paper has translated the accounts from Spanish into English, and edited the interviews to fit the structure of this paper.

Tatiana Monroy Pardo, co-researcher, Ecovillage Aldeafeliz: T-Lab Cusmuy

As an educator and co-founder of the ecovillage Aldeafeliz, I have been organising and facilitating T-Labs in the ceremonial house of our community called the *Cusmuy*. Representing the uterus of the Earth, the *Cusmuy* brings together human and non-human worlds through a methodology of *dialogo de saberes* (knowledge dialogues). Various T-labs have brought together ecovillage residents, neighbours, representatives from the municipality of San Francisco, Cundinamarca, and Indigenous elders to generate *dialogos de saberes* around the issues of water in the municipality and region [226]. Our goal was to generate a conversation

between the different stakeholders, with further T-labs working towards influencing public policies on water [227]. A strong focus has been placed on experiential learning, with T-Lab activities including the reconstruction of the *Cusmuy* based on Indigenous construction techniques, *olla comun* (the communal pot) where participants prepare food together, as well as *mambeos* which are ceremonial conversations around the fire with indigenous elders [89]. T-Labs are a way for participants to experience in a tangible way the connection to the territory - a bridge between the city and the traditional/ancestral.

David Coral, co-researcher, Corporación Nuh Jay: T-Lab Como canto tu alma (how your soul sings)

As a social innovator and co-creator of the Corporacion Nuh Jay, my role in the T-Learning project has been to investigate how the methodology of *Como canta tu alma* works as a transformative agent in different spaces. This involves combining ancestral methodologies with social innovation and art. An example of this was the T-Lab with the network of *campesino* women in Pasto, based on the *diálogo de saberes,* where women could find themselves from another perspective through song and movement, then reflect at a deeper level on what the role of a woman is. This promotes the feminine qualities of women, not from the perspective of resistance but from connection with one's own history, territory, and purpose, in company with other women [228]. Another T-Lab that took place was *Tinku Riway Yuyai*, which brought together indigenous elders from different traditions, as well as participants from civil society, around the theme of water to discuss how to bridge old and new visions for taking care of the earth [229]. Through employing the social technologies inherent in song and dance, our goal through the T-Labs is to contribute to transforming beliefs and practices towards new paradigms of existence.

Margarita Zethelius, co-researcher, Alianzas para la Abundancia, Las Islas del Rosario

As a biologist working in the area of resource management and rural development, my goal in the T-Learning project has been to connect natural systems with the realities of local communities in the Caribbean region of Colombia. I live and work in Las Islas del Rosario, with one of my roles being the representative of the Global Ecovillage Movement (GEN). Las Islas del Rosario is an archipelago of islands inside a natural park system, renowned for their corals and marine ecosystems. The main islands also contain an afro Colombian population, who after many years of resistance have managed to gain recognition as a native population with territorial rights. Within this context, I have set up a community-based training center for peace building and conservation called UBUNTU, where two T-Labs were carried out: The first T-Lab brought together important actors in the caribbean to explore means of supporting local communities to improve their quality of life in tough socio-ecological conditions [230]. The second T-Lab was part of the program we are running called Sustainable Settlements for Peace, aimed at giving individual and communities tools and knowledge for implementing sustainable systems in their local context [231]. An important aspect of both T-Labs has been including ancestral rituals with social tools such as non-violent communication, alongside practical courses in agroecology.

Section 3. Method and application: The Living Spiral Framework

Having presented the TAR methodology in section 1, and the context of the T-Labs in section 2, the present section will introduce the Living Spiral framework as a method to explore the experiences of the co-researchers engaged in TAR, within the context of climate change. These experiences will be presented by means of drawings and stories written by the co-researchers. The arts-based Living Spiral Framework is a written and visual guide for researching stories of transformation [66]. The guide employs the ecological model of the spiral, in the form of a generic plant, to identify transformative moments and processes, as well as the more transgressive barriers, active absences and invisible processes (see figure 2 below). With the TAR focus on *spiralling* processes of transformation, this framework was seen as useful for critically engaging with the strengths and challenges of working as co-researchers in transformative environments, as well as providing inspiration and structure for reflexive thinking.

Figure 2. Model of the Living Spiral. Developed by Martha Chaves, Dylan McGarry, Heila Lotz-Sisitka and Gibson Mphepo during the T-Learning workshop in New Delhi, India, November 2016.
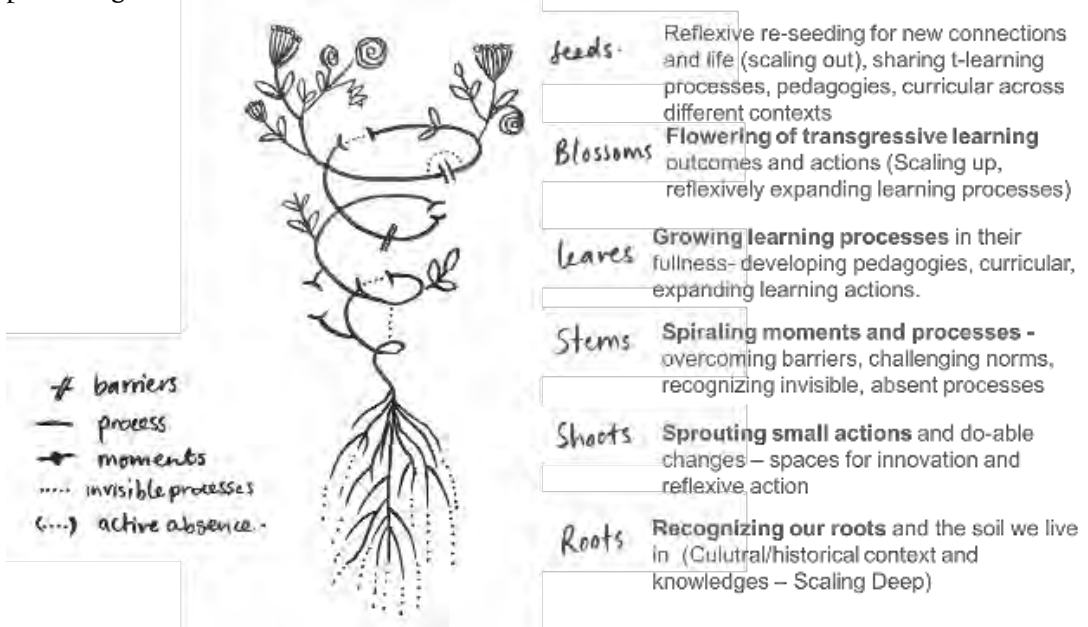
By following the Living Spiral framework exercises, each co-researcher has reflected on experiences in their respective TAR processes, based on three semi-structured interview questions: (1) what are the qualities necessary for a co-researcher in Transgressive Action Research? (2) How did these qualities manifest themselves in the facilitated T-Labs? And (3) What is the role of these qualities in the learning needed to address climate change? (see Annex 1 for original questions in Spanish). Consequently, each co-researcher wrote down their personal stories of transformation accompanied by a personalized representation of the living spiral model, which they then presented to each other in the form of answering the above questions. These stories and visual representations are presented here below. Please note that the narrative reflections below make up a part of a greater set of Living

Spiral exercise data, and as such represent a moment in time within a larger action-research project.

Co-researcher Living Spiral Representations

1. T*atiana Monroy Pardo, Ecovillage Aldeafeliz: T-Lab Cusmuy*
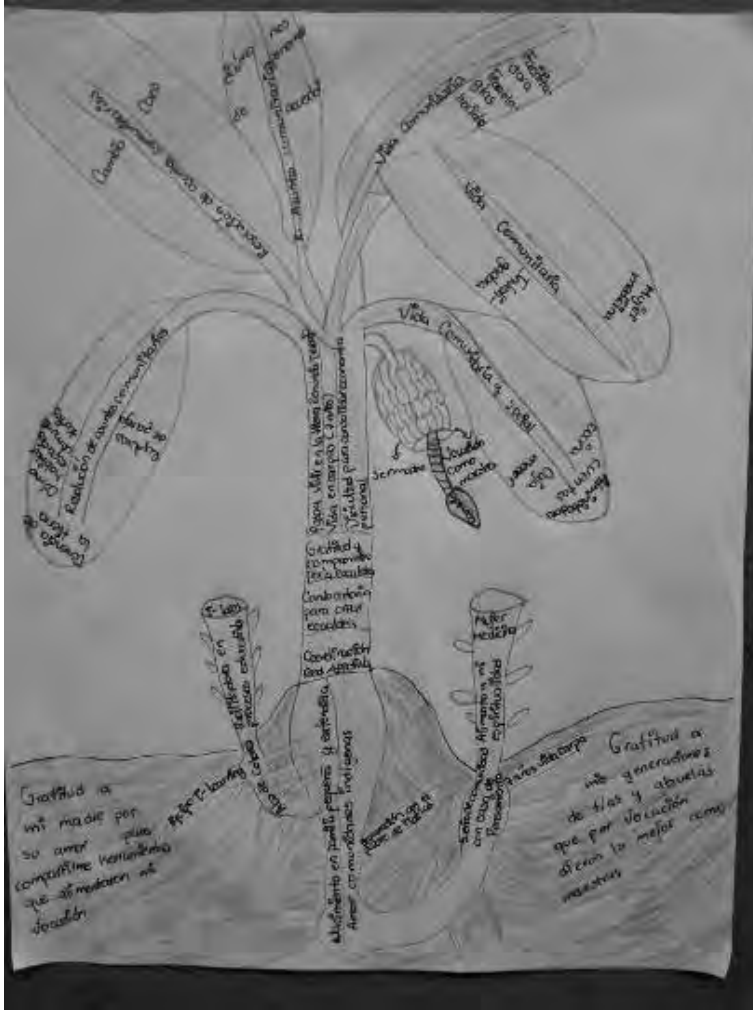
Figure 3. Living Spiral representation by Tatiana Monroy

The banana plant has become an emblem of the territory I live in, and I wanted to be inspired by a local plant to understand my role as a co-researcher in my territory. The banana has a form of reproduction below the earth, which is quite different than plants which reproduce through seeds. Shoots leave the earth, turn into stems, develop a flower which give fruit, and then the stem dies, while new shoots emerge from the ground. I connect this constant natural cycle for the importance for the researcher of *allowing research processes to die, so as to give birth to new ideas and insights.* I experienced this very strongly in the first T-Lab I co-organised and facilitated - *Canto al agua* (Sing to the water). Taking place in the *Cusmuy* of Aldeafeliz, we invited different stakeholders in the region to converse the threats

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and opportunities of caring for the water of our territory through the *dialogo de saberes* methodology. Representatives from the municipality were present, as well as our *campesino* (peasant) neighbours, other neo-rural people in the area, as well as residents of Aldeafeliz. As a facilitator, one of the things I had to let die was the categories I had made in my mind over the years of my *campesino* neighbours being the good guys, and the local municipality the bad guys. This prejudice had to die for us to be able to sit down at the same table and recognise each others' strengths and weaknesses. The municipality had a very clear position on quantifiable actions that they had carried out, such as number of trees planted to protect natural springs, and the number of farm visits. This was surprising to me because in my mind they were not taking action to protect the water of the territory. The *campesinos*, on the other hand, explained how they did not have numbers and figures to support their actions, but how they had been holding neighbourhood assemblies to discuss problems with water, and participating in *mingas* (collective work parties) to plant trees close to springs. As a researcher I was forced to remove my filters to generate the possibility of dialogue between different actors, which turned out to be a rich process whereby both the peasant farmers and the local municipality were able to recognise each other's' work, as well as a common feeling of abandonment: the *campesinos* felt abandoned by the municipality, and the latter felt abandoned by higher government structures.

Continuing with the banana plant metaphor it is important to note that the ability for the plant to sustain reproduction through strong healthy stems and leaves to absorb oxygen. This maturity of the plant to withstand insects and adverse weather I connect to the very important quality of the co-researcher *ability to see into the depth of themselves and the context they are studying* so as to understand the different transformative processes happening around them. The co-researcher needs to be well grounded to appreciate the profound and deep, the invisible processes around them, dealing with often confusing and frustrating processes. I have seen the development of this quality in myself while reflecting on the process which continued in the second T-Lab *diálogos municipales para la paz*, whereby the municipality invited actors in the region to come together to explore collaborative work. We accepted the invitation and brought all our methodological tools such as the *olla comunitario*, as well as social technologies such as working groups, to help the municipality carry out the workshop in the town of San Francisco. A representative turned up for an official handshake and to have his photo taken, then left, leaving the rest of us talking, and all agreeing, on what we wanted, but without the municipality present to make the project happen. I later found out that the idea to create a space for local crafts and artisans in the town had been given to the local transport industry. At this point I came up against a huge barrier, in which I had to develop the quality of *dealing with frustration and acknowledging the limits of my research-based action.* I took distance to the collaboration with the municipality, and instead focussed my energy on working with interested parties within the setting of the community I lived in, Aldeafeliz.

Figure 4. Living Spiral representation by David Coral

The San Pedro cactus is the plant I identify myself with in my territory in southern Colombia. As a representation of the Living Spiral model, it is very interesting as it is a shoot at the same time as it is a stem, takes a very long time to reproduce, and whose leaves are spines, a means to maintain moisture as well as to protect itself. Connecting the San Pedro drawing to the T-Labs I have facilitated, I think it is very important to highlight the middle of the plant, the primordial seed which is the start of everything, surrounded by the *chakana*, an old symbol of Indigenous cultures of the Andes representing all life - policial organisation, economic, social spiritual. Working with Indigenous ideas and customs has taught me a researcher quality essential to working with different cultures: *Appreciate and develop the skills to translate ideas between worlds that often do not understand each other.*

This quality was highlighted in the *MinkaYaku* T-Lab, during which I experienced an Indigenous elder saying that it is through dancing and singing that the climate is organised. At a deep level I connected with this insight - in ancient dances and songs of tradition, in which we dance for hours and days, we learn awareness of caring for the other and for oneself. The purpose of ancient dances has to do with connecting with the natural cycles of the territory we inhabit and astrological phenomena, such as sowing, harvesting, and equinox solstices. However, I could see that there were many participants present who did not understand this concept of climate change. A westerner may understand humanity as increasingly disorganised because of the changing climate. I helped to explain to some participants that the elders see it the other way around. From an ancestral understanding, the world is disorganised climatically speaking because the climate inside of people are disorganised. I also see my researcher qualities of *curiosity and a personal connection to the topic* of dance and song as fundamental to by ability to move between these different worlds.

One of the barriers I have faced in my work for Nuh Jay is my lack of formal titles and the constant struggle to articulate what I do with formal institutions who expect certain workshop designs and results. This can be seen on the top left of the San Pedro plant where one of the shoots has rotted. Such experiences, however, provide fertilizer for other processes to develop. These experiences have taught me that a co-researcher quality is *the importance of lowering the Gods from their pedestals, moving away from the ideas that the expert 'knows,' and is there to help the vulnerable.* This has to do with rejecting the idea of the objective observer, and instead allowing the heart of the co-researcher to be transformed.

A concrete example of this was the T-Lab working with *circulos de mujeres* (women circles) which was part of a set of workshops including *campesino* women, government representatives, NGOs, civil society, and myself as part of *Nuh Jay* facilitating discussions on gender and environment. Rather than simply giving a workshop as 'experts,' we went and met the *campesino* women before the workshop, as well as the municipal representative, asking questions about what they wanted and expected. Based on these conversations we designed the workshop around an *olla comunitaria*, appreciating that around collective food preparation important conversations would take place. This complicated the logistics and the budget for the workshop as it is usual to subcontract food preparation, and it was complicated to explain these conversations as concrete results to the funders of the workshops. But for us it was a means to include the women into the design of the workshop, and give them voice to the processes they were going through.

Figure 5. Living Spiral representation by Margarita Zethelius

I chose the tree as my spiral representation - a tree from the Colombian Andes where I was born. Sustaining this tree is life-giving water and the relationship with my mother. At the bottom of the picture is also a drawing of a *Temazcal* (indigenous sweat lodge) which for me has been a way of connecting more profoundly with who I am; not only where I am from, but uniting me with different places and people around the world in a matrix - what some people call Mother Earth.

Having worked many years with grassroots communities and sustainability networks, always wanting to change the world, one of the qualities I believe important for a co-researcher is *to be flexible, accepting that there is no perfect model, and to see everything that happens is an opportunity for growth, for analysis*. If as a researcher one does not have the ability to be flexible, to respond to an invitation to see things in a different way, then it is very difficult to move past my one's own mental barriers. This appreciates that perfection is not necessary, things can be good enough for now, accepting that we learn in different levels and dimensions. Nothing is completely objective, everything is subjective, everything depends on the moment that is changing, see them without being afraid, the confidence to know that you are doing things from the heart - that one is part of something greater than oneself. One of the ways I incorporate this quality into my research is flexible agenda making. For example, in the first T-Lab there were many people with different backgrounds present. The agenda was not permanent, with each activity being written on a piece of paper which could be moved to a different time slot. This may seem like a simple tool, but it prevents agendas from being too fixed, with a design that allows content to respond to a constantly changing context, and where the process itself can suggest a change in perspective. For example, one of the methods planned was a *pagamento* (offering to Mother Earth) which is usually held in the morning. However, the elder *Mamo* Juan said it should take place in the evening (when it is dark), so we decided to light a flame which remained lit for the whole workshop and contributed to a sense of continuity during the workshop.

Working with people of different backgrounds and educational levels, I also feel that the ability to listen actively, not just from the intellect, where the concept is coming from, but also *try to listen to the reality of that person, practising empathy, without pretending to understand their world.* I have given many workshops and shared so many stories that sometimes I assume that people know what I know. During the second T-Lab we were working with members of communities from around the caribbean, and I was using the word 'holistic' to describe the approach the Global Ecovillage Network uses to understand sustainability. Realizing that there were participants who did not understand what the word meant, I decided to stop the presentation. I asked everyone to come together in a circle, hold hands, and then asked what people felt. This activity was simple, but very powerful, and was a different way of learning together, understanding what 'holistic' meant in a more experiential fashion.

Finally, a very important co-researcher quality is the *capacity to document and systematise information and results*. This is something we struggle with Latin America, and the global south in general.
Perhaps it is that we capture things in a different way, orally, through stories, which I valorise, but it is very important to be able to speak a common language with those outside of our environments. In terms of the Living Spiral metaphor, this documentation of experiences represents the seeds which can be sown in other places, in other contexts, where the water of life can activate them and lead to new points of reference for society.

Section 4 - Analysis and Results

The above narratives were examined by means of thematic analysis (Boyatzis, [99], with the intent to distill qualities that characterize co-researchers engagement in TAR. The full text of the three narratives was inductively coded in order to identify patterns and related themes describing qualities of TAR co-researchers. As a means to limiting the effects of projection in coding the above narratives - imposing our own values and worldviews onto the data [99] – and thus ensuring reliability, the coding was carried out in three rounds by three authors, namely the lead author and the last two co-authors. First, two of the coders independently encoded the text and identified emerging themes. Minor divergences in results were resolved through discussion among the two coders. A third coder then proceeded with coding the narratives using the generated themes as a starting point. This process did not lead to new insights, other than a more nuanced understanding of the already generated themes. Based on this analysis, TAR co-researcher qualities are distilled and presented in Figure 6 below.

Being empathic: Connecting with a place, with oneself, with others, being emphatic

Letting go: Allowing for transformation, letting things die, accepting things as they are, moving away from fixed ideas

Being open: Being receptive, flexible, actively listening

Being dialogic: Being inclusive, generating dialogues, translation between cultures

Being analytical: Documenting information, thinking systematically

Resisting: Rejecting ideas, withstanding adversity, handling a struggle, copying with frustration, strength of character

Figure 6. Qualities of co-researchers in Transgressive Action Research

The results of this analysis demonstrate six qualities co-researchers consider important in TAR research. The first three qualities highlight the importance of care and emotions. In her narrative, Tatiana notes the importance of neighbouring peasants and municipality representatives *being empathic* with the struggles of the other, leading to a recognition of the important role each actor was carrying out in the community. Such empathy is facilitated by the quality of *being open*, whereby Margarita notes the importance of being flexible when facilitating community processes, embracing unforeseen events as opportunities for growth and analysis. This relates to what David notes as the importance of *allowing the heart of the co-researcher to be transformed*, highlighting the quality of *letting go* to fixed ideas such as that the 'expert' knows, or that academic titles are needed for facilitating community processes.

Qualities four and five relate to more cognitive elements. As T-Labs are inherently spaces for encounters between different people and ideas, quality four *being dialogical* is demonstrated by Tatiana noting the importance of peasants and municipal representatives sitting down at the same table to talk, while David tells of including the voices of the women in the design of the T-Lab. Quality five *being analytical* is demonstrated by Margarita noting

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the importance of the researcher capacity to document and systematise information and results, as well as the acknowledgement by Tatiana, through analysing her research process, of the limits to her research-based action.

Quality six *resisting* represents a break from the previous qualities, demonstrating the more *aggressive* associations to trans*gressive* action research. This is demonstrated in both David and Margarita rejecting the notion of objectivity, and Tatiana resisting the filters she had placed on her relations between peasant neighbours and the municipality. The more emotional aspect of withstanding adversity also clearly comes out in Tatiana's narrative as she deals with her frustration in realizing the limits to her researcher role, as the social fabric with the municipality unravels.

Despite the clearly delineated qualities in figure 6 above, a closer look reveals how co-researcher narratives share a common fundamental quality: *the ability to navigate and balance opposing states of being.* Tatiana, for example, must balance letting go of her personal prejudices while coping with the frustration and confusion of not being able to articulate a meaningful relationship with the municipality. Margarita must harmonise the openness and flexibility of working with different forms of understanding by participants, and the need to systematise the information and results of the T-Labs for evaluation purposes. Finally, David is balancing *being emphatic* - translating ideas between different cultures - with a strong quality of *resisting* dominant forms of expert-based knowledge, and institutional norms.

Section 5: Discussion

What has become clear during this introspective journey is that TAR implies not only engaging into a cyclical journey of reflection and action - as typical in (Participatory) action research - but also requires a fundamental quality of the researcher to transcend dualities, for example, letting go while resisting, being strong while being tender, and doing things from the heart while being systematic. This spiralling reflection process, appreciating the transformation taking place in the researcher, connects well with the idea of emergence in social learning [111], which also emphasizes the iterative nature of such learning and recognizes the inevitability and even desirability of indeterminacy. Such learning is also associated with the possibility of expansive learning [232], when researchers can come together in collaborative envisioning and a deliberate collective change efforts, as witnessed through the T-Labs.

In terms of climate change (in)action, this raises questions about what to do if these qualities are lacking within individuals or within the collective of researchers. Can such qualities be developed and, if so how?
A shared voice which comes through in this paper is that change must start with the individual - through a form of deliberate transformation [145]. In the words of David: to address climate change in the physical sense, there is need to change our 'internal climate' towards a more connected and coherent relationship with nature's cycles. An important means of generating such change is through experiencing other perspectives and even realities, through which T-Labs provide an important safe space for experimentation which allows for transgressive learning and disruptive capacity-building.

To conclude, we can understand TAR as an emergent strand of action research and PAR.

Although TAR and PAR obviously do overlap, what seems to set TAR apart is its rootedness in existential challenges, the recognition of confining structures and forces that impede transformation, and a commonly perceived need to transgress those forces and structures through a continuous spiralling process of action and reflection. The qualities a TAR participant needs to fully participate in this process can partly result from learning within the TAR community, as these qualities are often present in some of the participants. However, they also might simply be missing or lacking, in which case a more formalized or organized form of capacity-building might be needed where relative outsiders might join in and engage the group in the specific development of certain qualities or capacities. A T-Lab is a useful context for such learning, where is it important to employ specific tools and methods appropriate for a particular context. In the Colombian T-Labs such methods have been *dialogues de saberes* (knowledge dialogues), and pagamentos (offerings to Mother Earth), while there are a range of other methods and resources which may be relevant in other contexts, such as the multi-stakeholder partnership guide [233], and the SUSPLACE arts-based methods for transformation [234]. Finally, it is important for more research to be conducted into TAR like forms of action research, which in the context of climate change can contribute with inspiring and empirically grounded narratives in action-based change, as well new insights into identifying, analysing, and promoting counter hegemonic pathways towards sustainability.

Annex 1.

The original questions in Spanish were as follows: 1. Cuáles son los cualidades necesarias para ser un co-investigador en investigacion-accion transgresiva? 2. Cómo se manifestaron estas cualidades en los procesos de T-Labs que facilitaste. 3. Cuál es el papel de estas cualidades en los aprendizajes necesarios para abordar el cambio climático?

Appendix 4:

Transgressing educational boundaries: Levers and barriers towards bridging community learning and higher education through the Koru educational approach

Abstract

In times of global systemic dysfunction, there is an increasing need to bridge higher education with community-based learning environments so as to generate locally relevant responses towards reaching the Sustainable Development Goals of The United Nations' Agenda 2030. This can be achieved by creating and supporting so-called ecologies of learning which blend informal community-based forms of learning, with more formal learning found in higher education environments. The objective of this paper is to explore the levers and barriers for connecting the above forms of learning through the theory and practice of an educational approach that that fully engages the heart (feelings), head (thinking) and hands (doing). First, we present as a research outcome the development of an educational approach called Koru, based on a methodology of transgressive action research. Second, we critically analyze how this approach was put into practice through a multi-stakeholder course on responsible tourism, held in Colombia. Results show that ICT, relations to place, and experiential learning acted as levers towards bridging forms of learning between participants, but that addressing underlying power structures between participants need more attention for educational boundaries to be genuinely transgressed.

Key words: Transgressive Learning, decolonizing pedagogies, Living Curriculum, Learning Ecologies, Koru Educational approach

Section 1: Introduction

It is November 2018, and Colombian students at public universities are two months into a national strike. Wages for teachers have not increased in the last 10 years, with ever diminishing resources for public universities. As a sign of demonstration, the front gate of the University of Quindio is blockaded with chairs and desks. I am forced to enter the University through a narrow passageway further down the entrance, where security guards and students are milling around. Arriving at the stairs leading up to the department of natural sciences, a stereo is blasting. Students are painting a

mural, and writing slogans on the stairs. I make my way to the cafeteria where a group of students are waiting for me. As representatives from academia, the students have responded to the invitation to take part in a multi-stakeholder course on responsible tourism. As we sip coffee, and the students enter the virtual learning platform for the course, I feel the excitement begin to rise. Together with other actors we will be addressing the urgent need to bring together different forms of knowledge and practice in addressing climate change and sustainability.' (Reflection notes from co-author Thomas Macintyre)

Despite much fanfare around the signing of the peace deal between the Colombian government and the revolutionary armed forces of Colombia (FARC) in 2017, deep socio-ecological challenges are coalescing at many levels in Colombia. Climate change is affecting the country through increasing droughts and floods, and increasing social polarization around the politics of the peace deal alongside rising inequality is disrupting social cohesion. Although there is a lot of talk about the need for peace and a more sustainable world, the great unknown underlying this global challenge is *how* we can move towards a more equitable and just future.

As the United Nations has made clear, education needs to play an important role in the necessary transformations towards more environmentally sustainable societies [5]. Education shapes values and perspectives, and contributes to the acquisition of skills, concepts and tools that can be used to reduce or remove unsustainable practices [5]. However, with the complexity and ambiguity of sustainability proving difficult to address, there is increasing appreciation that we will need to *learn* our way to sustainability [11].

Yet this is no easy feat. The Colombian educational system (especially in rural areas) is struggling in this endeavour, with low coverage, lack of quality and equity, and is searching for ways to make education relevant for rural communities and responsive to the social and environmental needs of its population [23]. Furthermore, at a more general and global level, there are concerns that much of education today is mainly preparing learners to function well in a globalizing economy that is based on continuous growth and expansion, thereby, unwillingly at best, accelerating unsustainability [161]. Hence, creating education that contributes to sustainable development raises both questions of *quality* (what constitutes education, learning and capacity-building that will lead to a more sustainable world?) and of *transgression* (how can stubborn systems and routines that normalize colonial and associated neoliberal practices also in education, be disrupted?).

While lead author Thomas Macintyre sits with the students at the University of Quindio, Tania Villarreal is in the region of Putumayo, sitting with an indigenous *Camentza* family around the *shinyak* - the ceremonial fire of the family - discussing and drawing a biocultural calendar for their community. In the coffee region of Colombia, Martha Chaves is with the association of peasant farmers of Filandia (ANUC), discussing the creation of a tourist route between their farms offering visitors an authentic experience of the Colombian peasant culture. Last, off the Atlantic coast, Margarita Zethelius is with the afro-colombian community members on Islas del Rosario. They are meeting in *La Casa Taranga*, were they will later be watching videos on an online platform explaining the importance of different forms of knowledge and research methods. At the same time there is continuous interaction with Valentina Tassone and Arjen Wals, who are far from Colombia at the University of Wageningen, The Netherlands, providing information and feedback about emerging concepts

and methodological challenges.

These experiences and interactions all contribute to the making of a multi-stakeholder course called *Turismo de Origen* (Tourism of Origin). This course is a result of the three year international T-Learning project, focussing on 'transgressive' forms of learning-based change in the context of climate change [188]. The Colombian case study of this international project has involved several of the co-authors working closely with grassroots initiatives in the the fields of sustainability and climate change [13]. As will be described later in this paper, participatory diagnostics in grassroots communities resulted in responsible tourism being chosen as the umbrella theme for this course, with a shared challenge being the threat and opportunities of tourism to the initiative communities. Designed as a multi-stakeholder course involving different sectors of society and forms of learning [233], the course involved the following two groups (see figure 1 below):

1. *Academic participants and organizers:* The representatives of higher education are the core Koru team (first five co-authors), and the bachelor students in the area of Social Work from the University of Quindio. The organisational teams connects each of the participating community initiatives with a co-researcher acting as a facilitator.

2. *Grassroots participants* situated in three different Colombian contexts, all challenged by the detrimental effects of mass-tourism (a peasant group the coffee region, an Afro-descendant group on a Caribbean island, and an indigenous *Camentza* group from the region of Putumayo).

3.
4.
5.
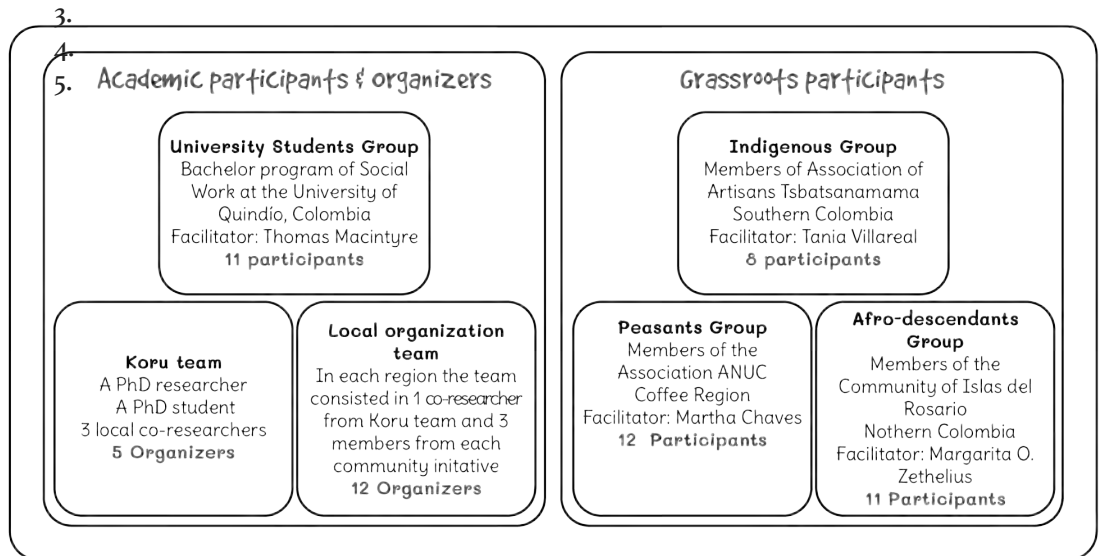
Figure 1. Characteristics of the organizers and participants in the course *Turismo de Origin*.

During the design of the course *Turismo de Origin*, an educational approach which we named *Koru* began to emerge which was sufficiently interesting in its ability to bring different forms of learning together to merit further development. Presenting *Koru* as an innovative educational approach for designing, implementing, and evaluating a multi-stakeholder course, and *Turismo de Origin* as a practical application of this approach, the objective of this paper is to explore the levers and barriers to bridging forms of learning across the diverse

contexts of the course participants, particularly that of higher education (represented by the Koru team and the University Students Group) and community-based learning (grassroots participants).

This paper will address this objective in the following way. Section two describes the conceptual background of the course development process, bringing together decolonization literature and the emerging field of transgressive learning pedagogy in a synthesis which we connect to the SDGs and transformative learning. Section three presents the methodology of transgressive action research (TAR), and learning concepts such as peer-to-peer learning, project-based learning, and blended learning. Results section four begins by presenting the Koru approach as a research result, providing a step-by-step diagram and short descriptions of each stage. We then use a reflexive form of monitoring and evaluation of this paper's objective of exploring levers and barriers to bridging community learning and higher education. This involves critically analysing the implementation of the course through co-author narratives, followed by attained learning from participants through analysing focus group carried out in each participant group. Section five provides a discussion and conclusion, where we comment on the merits and risks of transgressive forms of learning in realizing the kind of shift in head, heart and hands that seems needed to reach the SDGs.

Section 2: Conceptual background

"Through my academic work, I have been increasingly interested in exploring ideas and actions which genuinely represent a change in the status quo. Here in the coffee region of Colombia, a lot of focus is being placed on sustainable tourism. However it seems to me that there is nothing 'sustainable' about the displacement of local people through gentrification in towns like Filandia, where I live, due to a growing influx of tourists. Together with peasants of the local organisation ANUC Filandia, we were discussing how the strategy of selling 'coffee of origin' has helped local coffee growers to stay on their farms while giving them pride in their culture. 'Could we connect this to tourism?' one of the peasants asked. And so we started calling the process we were part of 'turismo de origin,' emphasising the authentic, place-based tourism we are promoting. This is transgressive in nature because it requires us to learn about who we are and where we want to go, co-creating a shared future so much different from where the mass tourism of our region is taking us (Reflection notes by co-author Martha Chaves)

2.1. Transgressive learning and decolonizing pedagogies

This research is framed under the international project "Transgressive social learning for socio-ecological sustainability in times of change," funded by the International Science Council.[32] The T-learning project, as it is referred to, focuses on investigating radical learning-based change at the nexus challenges of food security and sovereignty, water and energy, and social justice [48]. The project revolves around the emerging concept of *transgressive learning* which is considered a form of transformative learning that challenges the normalized status quo, by which socio-ecologically unsustainable habits are maintained [12]. In the context of this research, we are especially interested in what transgressive learning looks like in practice, and how this can inform the debates around the role of education, learning and capacity-building in working towards Agenda 30 through the SDGs.

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32   See: www.transgressivelearning.org

Transgressive learning connects well with currents of decolonizing pedagogies, which are gaining ground in academia as a resistance to Western imposed paradigms of development [22,117,235–238]. According to the IPCC [27], what is important in these theories of decolonization is the emerging transformative praxis in the sustainability sciences necessary to promote forms of learning that fundamentally address the challenges of climate change [27]. It is important to note, however, that decolonisation specifically refers to a historical process whereby countries that were colonised by foreign powers obtain their independence. Decolonizing pedagogies therefore refer to pedagogies which promote marginalised forms of knowledge, such as indigenous and local knowledge (ILK), in Latin America [63,239] alongside African movements [117,238], as well as pedagogies rooted in place and belonging [18].

In the context of higher education and curriculum studies, decolonisation tends to either refer to fundamental changes in the nature and identity of the university - questioning and dismantling oppressive colonial structures in institutions - or refer to changing the content of the curriculum to include indigenous and local knowledge which is more relevant to regional and student context [117]. Overall, a perceived danger in decolonising pedagogies is that emphasis is placed on replacing a dominant paradigm with a marginal paradigm, both of which are considered homogenous and static [117,118]. This fails to recognize that all knowledge traditions are saturated with power and inequalities, and that rather than being static, knowledge traditions are constantly changing through an exchange of ideas and practices. We can understand this dynamic as an ecology of knowledges [63] in the form of epistemological pluralism [240].

In response to these challenges, transgressive learning takes a dynamic perspective on knowledge, one that recognizes that dominant power structures and persistent inequalities act as barriers to the realization of more sustainable futures [12,48,80,161,241]. The contribution of transgressive learning to decolonial debates is that rather than replacing dominant with marginal paradigms, the focus is on the *learning processes* which can lead to transformation of the system itself, appreciating the uncertain, changing and often unknowable aspects of knowledge production, in what we can understand as a learning ecology [242]

2.2. Learning towards reaching the SDGs in relation to innovation in higher education

Education for Sustainable Development (ESD) is considered vital in educating citizens for the future, providing a framework for achieving the goal of "quality education ... for all" as stated in SDG 4 [6]. Specifically, higher education is mentioned in target 4.3 of SDG 4 which aims to "By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university" [243]. There is increasing debate, however, as to what the 'qualities' of the university should be, and how to make higher education more available and relevant to an increasingly unequal society [161,244,245]. While Higher Learning Institutions (HEIs) have traditionally been regarded as the main source of knowledge production, and remain powerful actors necessary for socio-ecological transformations, they are increasingly receiving critique in regards to their validity in producing knowledge and solutions capable of addressing societal challenges. Hall and Tandon [22], note that HEIs exclude many existing knowledge systems, including many indigenous ones in the world, and as such promote only a fraction of the knowledge of the world. Referring to the work of Sousa Santos [63], Hall and Tandon go as far as to describe this process as epistemicide–the killing of other knowledge systems.

A response to this critique of epistemicide is adopting a more responsible and responsive ethos to fostering the renewal of higher education [25]. Based on the educational design principles of *educating whole persons*, as presented by Tassone and colleagues [25], the head-heart-hands model of transformative learning [60], and the more transgressive form of 'learning to anticipate,' [38], the following forms of learning represent some elements of a learning ecology [242,246], which we will connect to the bridging objective of this paper between higher education and community learning:

1. *Learning to know:* the head-based cognitive form of learning which we traditionally connect to classroom-based teaching. Cognitive learning is needed to research complex socio-ecological issues, to understand multiple forms of knowledge, to navigating uncertainties and reflect on innovative solutions. Beyond knowledge transfer, this domain also explores deeper transformative learning brought about through critical thinking and reflection.

2. *Learning to be:* This is the affective 'heart-based' domain of learning related to emotions, feelings and relational knowledge [60]. It is brought about through collaboration between actors, cultivating social attitudes and values through a sharing of experiences, and nurturing a sense of care and stewardship towards people and planet. Sometimes 'learning to care' [247] is used to emphasize the latter.

3. *Learning to make change:* The psychomotor domain of learning, or the physical expression of our capacities through our hands. This domain includes learning practical skills and physical work, with an important aspect being physically present, and building relationships with a place [60].

4. *Learning to anticipate:* Focus is placed on being critical and reflexive to what is or is not being learnt, absences and unintended learning outcomes [38], and learning for an unknown future [36,248].

Recognising that forms of learning in higher education and community contexts need to be interwoven and challenged through experiential and place-based learning [25,60], this paper presents the enactment of the Koru educational approach in the form of the course *Turismo de Origin*. This is in line with work by authors such as Hall and Tandon [22] who claim that community-based participatory research can use knowledge as an action strategy for change, and visibilise marginalised knowledge, and Lotz-Sisitka et al. [249] who note the development of transformative agency in community learning in Africa.

Our contribution to innovation in higher education is exploring how often marginalised knowledge found in grassroots communities can enter into a conversation with more dominant knowledge systems in higher education through a multi-stakeholder approach. The overarching research question is: what are the levers and barriers to connecting higher education, with more local and context based community learning?

Section 3: Methodological background

The *Koru* approach has evolved out of an action-research methodology, which in broad terms involves scholarship–practice with a focus on multi-stakeholder engagement and a change agenda [16]. Specifically, *Koru* has been guided by earlier work on Transgressive Action Research (TAR) in the T-Learning project, which is characterised by a focus on working with co-researchers on local sustainability issues, employing participatory tools to promote transgressive learning through critical and reflexive thinking and action [13].

Part of the TAR project was carrying out a future search exercise in 2017 called Dragon Dreaming [87], whereby the first five authors reached a collective vision of generating pedagogical material in the respective communities they were working in, to be organized into an educational course to offer other communities [86]. The focus of this material was community-based knowledge and experiences in climate change, with material being produced in transformation Labs (T-Labs) held in participating community initiatives in 2017/2018 [13,89,226–231,250]. With T-Labs having been completed, the challenge was identifying mediums to connect these experiences *between* community initiatives, and other actors such as academia so as promote post-colonial epistemologies and curriculum innovation that would unite action and reflection around local contexts.

3.1. Methods and data analysis

Addressing the first objective of presenting the Koru as novel educational approach, we have reviewed collaborative documents developed by the Koru team throughout the course process. In the results section below, we describe the evolution of the educational approach through the learning concepts used, present the approach in a 10-step diagram, and briefly describe the first eight steps to give the reader an idea of how the approach was operationalized in the course.

Meeting the second objective of critically analysing the levers and barriers to bridging community and higher education in this course, we use two methods. First, through narrative inquiry, co-researchers in their capacity as academics, reflect on their experiences in facilitating the course. Narratives have been shown to be a useful way of communicating community learning [80], with narrative inquiry research being especially useful in curriculum development [251,252].

Second, through focus groups, the learning experiences as perceived by participants are explored. Focus groups were held by the co-researchers with each of the three grassroots participant groups, and the university group (see figure 1). Focus groups have been shown to be an effective way of eliciting the student voice in higher learning curriculum design [253]. Each focus group was facilitated by the corresponding co-researcher,[33] with questions centered around the different aspects of the course and forms of learning (as described in section 2.2): the diversity of knowledge sources (learning *to know*); interaction with other participants (Learning *to be*), practical collaborative work (learning *to do*); and unanticipated outcomes from the course (learning *to anticipate*) (see appendix 1 for focus group questions).

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33   A focus group discussion was not held with the Interdisciplinary group due to the participants' diverse geographic locations not allowing for a common time to be agreed upon.

The process of data analysis was based on thematic coding [99]. Each focus group was recorded, and an abridged transcript for each focus group was made by the lead author in the qualitative analysis software NVIVO. In order to enhance reliability [99], the coding process was performed in various rounds and by various authors. The lead author carried out the first round of coding deductively, based on the focus-group questions template, with the objective of categorizing the data and related quotes of the participants according to the four forms of learning. Through nested coding, these categories were then coded inductively as to whether they acted as levers or barriers to bridging community learning and higher education. The second author revised the first and second round of coding, with some divergences in results being resolved through discussion among the two coders. In a third round, the previous categories were analysed by the first two authors individually to identify the themes that were emerging based on the lever and barriers previously identified. There was some variations between the themes identified between the two authors, and these were discussed in a fourth round, between the two coders, as well as co-authors six and seven, who did not participate in the course, but who contributed to the thinking process throughout the development of the research. As a result of this process the final set of themes have been defined, and elaborated in the results section 4.3.

4. Results and analysis

The Koru approach is an innovative result of the T-Learning project that involves the design, implementation and evaluation of a multistakeholder course involving different forms of learning. The approach has been developed through iterative reflection cycles by (co)researchers, which, inline with the TAR methodology, presents learning as *"a spiralling process of learning-based change"* [13], characterised by community dynamics inherent in the participatory nature of the course. This section will begin by presenting the Koru educational approach, followed by the results of how it was implemented through the course *Turismo de Origin,* focussing on the paper objective of exploring levers and barriers to bridging community learning and higher education.

4.1. The 10 steps of the Koru educational approach

As a means to connect geographically diverse participants in the course, without losing the personal connection between participants, it was decided to work with connecting face-to-face learning with Information and Communication Technologies (ICT), known as blended learning [116]. A collaboration was developed with the Colombian company *nuevos medios* who specialise in online learning platforms, who provided technical capacitation to the Koru team in how to develop online learning modules, and manage registrations on the company's learning platform.[34]

A second important learning concept was peer-to-peer learning and interaction through Farmer to Farmer learning (FAF), developed by the agroecology movement in Latin America [114]. This involved (1) clearly identifying the main interests and necessities in terms of what community members wanted to learn through participatory diagnostics; and (2) the

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34   *Nuevos medios* is a Colombian company who specialize in developing online learning platforms. The company provided provided training in the use of their online platform *kme 360*, including how to add and organise learning modules, inscribe participants, and carry out evaluations. See the website http://www.nuevos-medios.net/ for more information.

generation of pedagogical material within community contexts, centered on community experiences, needs and what they have to offer other communities.

A third point made very clear during the T-Labs was the importance of basing learning around practical projects relevant to community initiatives. Project-based learning was therefore used which involves inquiry-based learning through practical projects that reflect participant knowledge and experiences [115].

Inspired by a diagram of project-based learning [254], the Koru approach merges the learning concepts above into a 10 step process to design, implement, and evaluate a multi-stakeholder educational course (see figure 1 below). Each step is led by the core Koru group, which is composed of co-researchers acting as cultural facilitators between each community group and the overall project. The core Koru group is in charge of the organization and facilitation of the course with the communities' input and consent. In addition, some steps involve local teams, which are composed of community members and their respective co-researcher.

In the following sections we will briefly describe how each step was operationalized in the course, taking note that the steps in this diagram have been developed during the course, in a reflexive manner consistent with the TAR methodology. This will show how TAR can be organized into an educational approach which promotes co-engaged participation and action-based change.
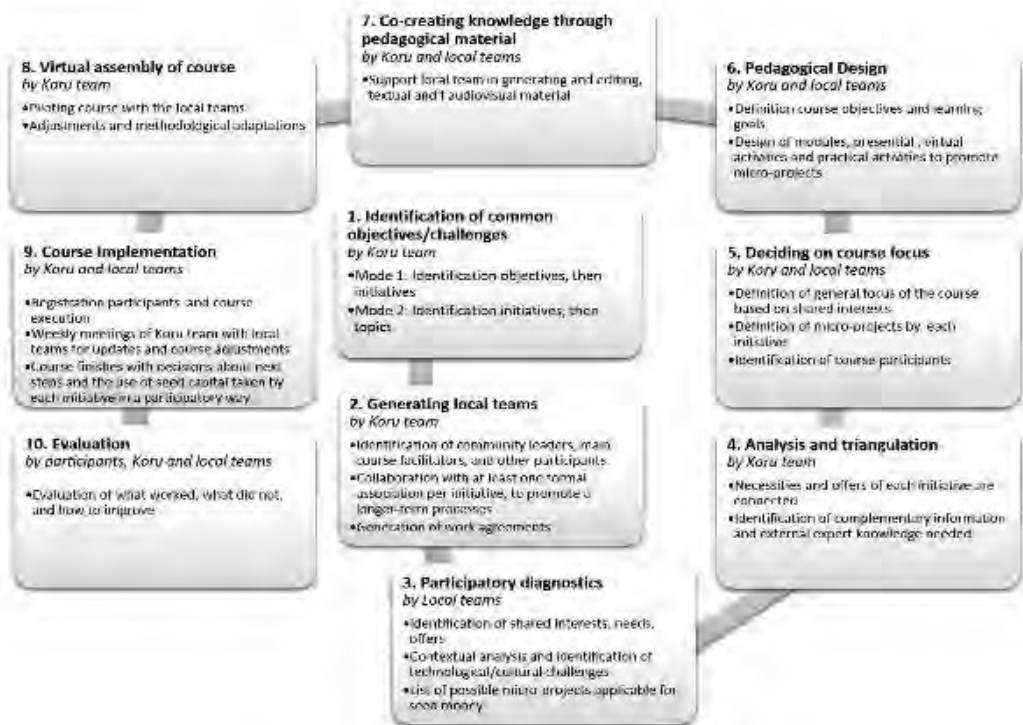

Figure 1. The 10 steps of the Koru educational approach.

4.1.1. Step 1: Identification of common objectives and challenges

In the third year of an action-research project, the co-authors in this paper have been working closely with grassroots initiatives in the fields of sustainability and climate change in Colombia [13]. With trust having been developed with these community initiatives, we decided to follow mode 2 in figure 1 above, whereby initiatives were chosen first, and the course topic was chosen afterwards. This has the advantage of working with communities where trust is already developing, but has a potential disadvantage of limiting the overall objectives of the course to the contexts of the communities. Following mode 1, a more defined objective/challenge can be decided upon from the beginning, but more time needs to be spent identifying interesting communities and building up trust.

4.1.2. Step 2: Generating local teams

Enacting context-based change implies working with locals who understand the challenges they face, and are motivated to continue a process after the official project runs out. The TAR approach of working with co-researchers is fundamental to this, as successful co-researchers can facilitate the interaction between the community group and the project. This means understanding the dynamics of the local culture, while also understanding the context and requirements of the research project and communicating this to community members.

Through their close involvement with communities, co-researchers were able to identify community leaders and other motivated participants who had the motivation to actively participate in the course, creating local teams. Concrete agreements concerning consent to audiovisual material was negotiated and signed, as well as the formal associations connected to each co-researcher insuring responsibility for the continued process after the course finished.

4.1.3. Step 3: Participatory diagnostics

In line with the FAF methodology, participatory diagnostics were carried out in each community initiative to identify needs and offers. Recognising the different cultural contexts, a tailor-made process was carried out in each community initiative. In the *Camentsa* community, for example,

There were talks while walking through the productive plots of members (*jajanes)*, followed by participatory mapping to learn of territorial challenges. With the afro-Colombian group there was conversations with participants in *la casa Teranga* around the role of different actors in the region, as well as mapping exercises around necessities and offerings at different scales. Finally, with the association of peasant farmers (ANUC), individual farm diagnoses were carried out in the framework of resilience, followed by a socialisation of results, and a SWOT analysis and discussion of peasant farm resilience in the region. Complementing context-specific methods, Global Ecovillage Network (GEN) design cards, were used in the three communities, which explored holistic sustainability and whole-systems design using visual representations and short descriptions for sustainability.[35]

35   See the website https://ecovillage.org/resources/market/ecovillage-design-cards/ for more information

Figure 2. GEN ecovillage card game to diagnose strengths and weaknesses in the different dimensions of sustainability: ecological, economic, social and cultural. Photo credit: Thomas Macintyre.

4.1.4. Step 4: Analysis and triangulation

Data from the diagnostics was coded and mapped by the core Koru group through connecting the needs and offerings of the three communities. Figure 3 below represents this mapping exercise whereby the blue circle represents the needs expressed by the Afro-Colombian community in Las Islas del Rosario, the orange boxes represents what the indigenous participants Camentza have to offer, and in the green boxes the offers expressed by the peasant participants of ANUC. The arrows represent the connection of needs and offerings between communities. Within the blue circle, the needs that are in red were those which could not be matched with other local knowledge, and so would be met by outside expert knowledge.

on the ecovillage playing cards.
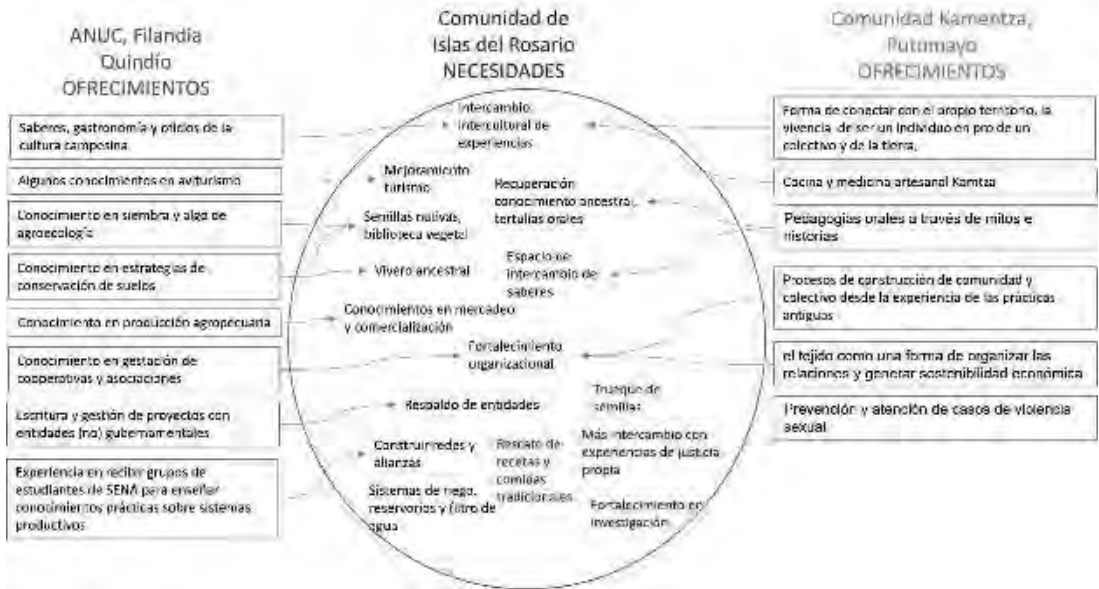
Figure 3 (in Spanish). A map of the connections between the needs and offers of the three participating communities. It is not necessary to understand the Spanish, just how the need and offers were connected between the communities.

4.1.5. Step 5: Deciding on course focus

Despite the diverse contexts of the three communities, a list of common themes emerged. The main theme was that of tourism, with all communities sharing their struggles with reconciling tourism as a necessary source of income, versus its shadow side of cultural and environmental degradation. A shared desire was to use tourism as a means to promote local culture, increase biodiversity, as well as generate dignified livelihoods. *Turismo de Origin*–a form of tourism which promotes the roots and authenticity of the region–was decided upon by the Koru team as the course focus. Alongside the three participating communities, invitations were sent to entrepreneurs and local NGO representatives connected to each community, so as to connect business innovation and local organisations to the community processes. As an interdisciplinary group, co-author Tatiana Monroy took responsibility for this group. Under the supervision of the lead author, a group of university students from the university of Quindio, Colombia, were also invited to contribute academic skills of knowledge systematization between the participating groups, as well as representing academic actors in the dialogue with community members.

4.1.6. Step 6: Pedagogical Design

A five day workshop was held with the Koru group in which the course objectives and learning goals were identified. This also involved the design of the curriculum modules including content and activities (see figure 4 below). During this workshop, a draft of the 10 steps of the Koru educational approach was developed, involving reflections on the steps carried out so far, and how the course would be implemented and evaluated. With the overall design completed, each co-researcher took responsibility for developing one of the course modules and generating the pedagogical material with their respective community.

AIM:
Strengthen the connection between society, research and technology through the recognition of the value of local knowledge and the active participation of diverse actors in addressing a common local challenge.

THEMES:
Tourism and local knowledge
Territory/Place/ Identity
Biocultural diversity
Landscape ecology
Appropriate technologies
Alternative economies and organization

PEDAGOGY:
Decolonial approach: Community members are the protagonists of the course with valid and useful knowledge to share
Transgressive approach: Knowledge is uncertain, unstable and disputed; Experiment with innovative ways of disrupting inefficient formalized knowledge systems to visualize the unexpected and the silent / absent.

CONTENT:

Introductory Module:
Acquaintance with use of the online platform and the course focus of "Tourism of Origen"

Module 1:
Endogenous and scientific research, recuperation of local practices

Module 2:
Apply ancestral and current knowledge to the defence of territory and the conservation of bio-cultural diversity

Module 3:
The use of appropriate technologies in "Tourism of Origen"

Module 4:
How do we organize ourselves for a "Tourism of Origen"

LEARNING PROCESS GOALS AND ACTIVITIES

GOAL: Share and cross the boundaries between empirical knowledge, academic knowledge and territorial knowledge among diverse locations (*learning to know*)

ACTIVITIES: viewing and reading online material, and leaving comments on virtual platform

GOAL: Generate interaction and affective relations between participants with diverse backgrounds (*learning to be.*)

ACTIVITIES: Exchange messages, photos and videos through a whatsapp group, and meet through video conferences

GOAL: Address shared challenges across the three territories in a practical way (*learning to make change*)

ACTIVITIES: Workshops to plan micro-projects around tourism of origin (e.g. biocultural calendars, Workshops around food, and presentations and feedback of proposed projects during video conferences.

GOAL: Being open to the unexpected and unknown, and learning from what emerges in specific contexts (*Learning to anticipate*)

ACTIVITIES: Flexible workshops designed for unexpected learning to take place, including reflexive and group activities that cross participant boundaries, e.g. participants filming themselves and sharing in public.

Figure 4. Overview of the course Turismo de Origin.

4.1.7. Step 7 Co-producing knowledge through pedagogical material

An important aspect of the Koru approach is that the majority of pedagogical material is generated in the community initiatives themselves by local teams. The rationale is that community members (especially youth) are capacitated to film interviews and best practices with other members which will make up course content. Through this approach, the model of expert knowledge and subject is reversed, giving voice to knowledge and experiences at the grassroots level.

4.1.8. Step 8 Virtual assembly of course

Each co-researcher assembled the module they were responsible for, including editing and uploading videos, adding text, and contributing to a virtual library where further resources connected to the course themes could be accessed by participants. The finished course was then piloted by each local team, with technical and methodological adjustments carried out to better align with local realities. An example of such an alignment was the shifting of responsibility of uploading material to the online platform from the local participants who often had low Internet connectivity, to the co-researchers who generally did have good connectivity.

4.2. Step 9: Course Execution

The course *Turismo de Origen* took place between November 5 and 30, with 56 registered participants. A challenging aspect for the course was the participation of individuals and communities with different social, economic, and cultural backgrounds, as well as technological access and capacity. These anticipated challenges had led to a focus on flexibility and on-the-ground changes taking place during the course through close accompaniment of co-researchers to each community. Having briefly described the previous steps of the Koru approach, this section goes deeper into the 'curriculum in action' of the course. The following accounts by co-authors highlight specific aspects the the course that acted as a lever or barrier to bridging community learning and higher education from their own perspectives as representatives of higher education. These narratives are based on field notes by co-authors taken during the course.

4.2.1. *"Learn together, not apart." Margarita Zethelius, Las islas del Rosario*

From the start I had anticipated challenges in terms of internet and electricity availability, as well as access to cellphones and computers to take the course. Las Islas del Rosario is not connected to the energy grid, and many residents have few economic resources. The initial design of the course involved the online material to be taken individually. The logic of the online platform is that each participant registers with their email address, views material from their account, with the platform then providing individual statistical data for evaluation purposes. However, the phones of two of the participants in my group broke right before the course began, and during the inscription I realized that many participants did not have email addresses with which to register. It also just seemed difficult for many of the participants to carry out activities by themselves in the format of the modules. Unlike the participants in my group, I have a university degree, and having been taught to work individually and systematically. I reflected on the the "traditional" logic of the participants is more to *learn together, not apart*, and that for them it is challenging to navigate different the logic of higher education. I decided to adapt the solution turned out to be that I showed the online material at defined times through a projector in *La Casa Teranga* (part of the UBUNTU community center). This was much more motivating for the participants, as they could watch and discuss the material together. As one of the participants shared *"is nice to hear what others understand and share opinions"*. It was also practical as the center has electricity and wifi.

Figure 5. Participants from Las Islas del Rosario viewing material in *Casa Teranga*. (Photo credit: Margarita Zethelius).

4.2.2. "Undervaluing their own knowledge." Thomas Macintyre, student group

I had expected the university students to be the most active members in the course, contributing and synthesising concepts, as this is one of the great strengths of science. As a group we met at the university of Quindio and synthesized the three community projects into three national tourist routes based on the offers and characteristics of the three communities. The students presented these proposals back to the communities in a video conference. I felt this had been received well by the communities, and I was impressed by the majority of students actively sharing research experiences in the whatsapp messaging group, and responding enthusiastically to the experiences of other participants. However, particularly one student struggled to provide a voice. Having noted that the student was not participating in the whatsapp group, I asked the student: why not? The student's reply was interesting: *"Who am I to comment on 'other' forms of knowledge? Other participants come from communities where there is so much culture. I have nothing to contribute with."* I suggested the student (who had completed all the online material) share views on scientific knowledge in academia. The student replied, however, that it was the community members who were the protagonists, and that the emphasis should be on what they had to share. As an academic myself, fascinated by other ways of knowing, and having shared my own perspectives with course participants, I see the students reluctance to share as an unexpected outcome of the course, demonstrating a learning barrier between the the student *undervaluing their own knowledge* in relation to that of other participants.

4.2.3. "Giving voice to what tradition is today," Tania Villarreal, Camensta community

As I sit with the *Camenzta* community around the three stones of the *shinyak*, I reflect on what is taking place around me. We are discussing the issue of biocultural calendars in module two of the course, and the role of technology. I am struck by the importance of

giving voice to what tradition is today, instead of what it was in some distant past. During the development of the biocultural calendar, elders were sharing how time is understood in the traditional way, with changes in weather, insects, flowers, and festivals. Yet younger participants were questioning how to measure time in *today's* world. The weather is increasingly uncertain, and some insects or birds no longer come to mark the beginning or end of a season. This opened a very interesting conversation on the necessity to investigate the state of the biocultural calendar nowadays and to compare it to the older one in order to make a real diagnosis of the biocultural state of the territory and understand what can be rescued and what has been lost. One of the participants connected this to the use of technology. Many indigenous elders are resistant to these new technologies because they feel they distract youth from appreciating their culture. With my experience in researching and facilitating community processes, I had hoped that the young people in the course would learn to use the technology, and would teach older people to use technological tools and encourage them to participate in the videos, thus sharing their experiences with other participants far away. This happened, though there was quite some timidity in sharing the videos, for example through whatsapp. From a sense of knowledge appropriation, young people talked about how technologies can be used for their own community processes, such as exploring weather patterns, and promoting handicrafts through making contact with potential visitors by whatsapp. Quoting one of the older participants, Yudy Jamioy: *"We realize that technology is not just a waste of time. If it is used well, it can be of benefit for what we want to achieve."* This contributes to the transformation of a belief deeply rooted in the community that technology is just a distraction, towards an appreciation that it can be used for promoting community processes.

Figure 6. Camesta community members sitting around the *Shinyak* preparing food. Photo credit: Tania Villarreal.

4.2.4 "ICT created affective bonds of friendship between participants," Tatiana Monroy, Facilitator

It is midnight and I am sitting by the fire at my home in Spain, ready to facilitate a video conference between the participants of our course. In Colombia, 6 hours behind, people are finishing work and will be getting ready for the conference. There is a lot of responsibility on my shoulders to make sure that the conference runs smoothly. Internet is often poor in the Colombian countryside, and many participants have never participated in a video conference before. But I feel that everybody is curious to get to know each other, and to work together on the mico-projects. I activate the video conference, and one by one participants start to enter. I see their faces, and my heart feels deep joy to connect the communities together. For the past month they have been seen each other in videos on the online platform, and shared messages on whatsapp. Then the time has come to start. I introduce everyone, explain the agenda and etiquette for using the video conference platform. Miraculously there seems to be a good internet connection in all the communities, and the video conference runs smoothly. From my academic perspective in communication and psychology, I am deeply impressed by the presentation of the *Camentzá* community. They are very organized with a video camera connected to a computer, and they have delegated their talking points amongst themselves. They manage not only to communicate their experiences with the other participants, but I felt the depth and conviction of their real world situation, which is often not conveyed in classroom learning. Although this meeting has been virtual, I feel that the *ICT created affective bonds of friendship* between participants who would not normally meet.

4.2.5 Experiential activities can lead to collective understandings, Martha Chaves, ANUC Filandia

"I truly feel more confident with the hoe in my hands, and my feet on the earth. I know how to plant I don't like to write. This is why I enjoyed the course, we could learn by doing, and also by watching and reflecting on other participants in the videos whom were also doing something" (Guillermo, ANUC). This type of experiential learning was best felt during the main workshop of the course, where my group along with the students from the University of Quindio met at the ANUC *Casa Campesina* in the town of Filandia. Each participant was encouraged to bring a food dish based on a recipe from their childhood, representing a traditional food of the region. The workshop began with a story by a local historian narrating the history of the town and how the 'Filandeña' culture had developed. Then we began the food preparations. Each participant presented their dish. This included the actual recipe, but also the memories that they bought up. Oscar presented a pork recipe that his mom used to prepare each sunday, and Hernan brought a plantain *colada,* a beverage that filled him with energy before going to school every day. Discussions centered around how relations and emotions were built and expressed through food. This was exciting because the experiences crossed all boundaries between the peasants, the students, and other representatives present, providing a feeling we all had something in common. As a group we talked about the other communities in the course who had shared traditional recipes through the whatsapp group and whom had emphasised the effort they put into keeping their culture alive. In relation to these reflections, an interesting sentiment shared by both university students and ANUC members was that they were not sufficiently organised to maintain the peasant culture in the face of mass tourism. As a means to recuperate 'forgotten' practices, many participants shared a desire to organise further practical workshops in topics such as bringing back native seeds, and learning more about their local history.

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Figure 7. Members of ANUC and University Students of Quindio listening to local historian in *la Casa Campesina*, Filandia. Photo Credit: Martha Chaves.

4.3. Step 10: Evaluation

The evaluation of the course, as perceived by the learners (attained innovation), was explored through four focus groups, each facilitated by the respective co-researcher. The focus group objective was to generate discussion on how the course had bridged different forms of community learning with forms of higher education between participants (see appendix 1 for focus group questions). The following subsections show the results of the thematic coding (method described in section 3.1.) with each theme having been identified as a lever and/or barrier to the above objective, with reference to the four forms of learning described in section 2.2. (learning to -know-be,-make change, -anticipate).

4.3.1. Use of Information and Communication Technologies (ICT).
The ICT theme emerged strongly in the course due to the blended learning approach, whereby technologies such as videoconferencing, whatsapp messaging, and the online platform were combined with physical face-to-face workshops to provide opportunities for participants from different communities and students to interact across Colombia and Spain.

An anticipated barrier to this process was the technical challenge shared by most participants in negotiating the online learning platform. However, as Emerenciana from the *Camesta* community noted in the focus group, *"I was intimidated by the technology for the course, but you* [co-researcher Tania Villareal] *came to our house and showed us how to use the techno-*

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logy, it was a very good opportunity." In general, technical challenges were overcome and did not result in a barrier to learning.

However, graduate student Alejandra from the University of Quindio, noted that although the content was comprehensive, there was too much information in each module. During the focus group Alejandra shared that although it was fun that most material was in the form of videos, she got saturated by the quantity of visual material. This feeling was collaborated by co-researcher Margarita in an informal exchange with the other authors, whereby Margarita noted how participants in Las Islas del Rosario started losing focus after watching a series of videos, especially the videos which only showed the person speaking.

As a lever to the bridging objective, the focus groups brought out references to critical reflection generated by the online material. Camila of the *Camensta* community noted of Las Islas del Rosario, *"From a situation of so much scarcity, they continue moving forward, not braking, although they do not have energy, or their own drinking water. Here we have everything, and we do not appreciate it. I saw on the videos on the platform they have ways of harvesting water, while here we complain if the water gets cut off for two hours in the evening."* This form of critical reflection with affective undertones was shared by Fernando of ANUC in his reflections about the afro community in Las islas del Rosario: *"we sometimes think of the costenos* [people from the coast] *as very 'tropical'* [low work ethic]*, but in the videos I saw people with a lot of energy and drive, conscientious and worried about their future."* Reflecting on her own community in Las Islas de Rosario, "Marcella" noted how as a child, *"when teachers asked us for information, they sent us to the library or to ask somebody. Now we ask everything to the computer, the smart phone. However, during the tertulias* [oral gatherings]*, we recorded the conversations of the elders, we are giving a positive use to the technology. Giving voice to the saberidores* [those that know].

Acting as a lever, ITC also contributed to anticipatory forms of learning, particularly in the way it was received by participants using online technologies for the first time. Guillermo from ANUC shared his amazement that the facilitator for the video conferences was in Spain [see section *4.9.4*]. *"She* [co-researcher Tatiana Monroy] *could connect us to the community in Las Islas and the Camensta. This is something amazing. How the world is changing"* Emerenciana from the Camesta community also noted how *"We talk a lot about what is one's own, what is sacred and every-day. But this also needs to move in the world of technology...bringing these aspects together will help us give some authority in the work we are doing, especially with the institutions we are working with".*

In summary, ICTs acted as both a lever and barrier to connecting the participants together. Although technical challenges were overcome, at a cognitive level *(learning to know)*, the course provided too much content for some participants, leading to an oversaturation of information. On the other hand, especially affective form of *learning to be* took place with participants being able to empathise the realities of other participants through the ICT mediated material, which led to a strong sense of critical reflection between the participants. In terms of *learning to anticipate*, a clear sense of wonder and appreciation by participants to the possibilities opened up by ICTs (especially the videoconferences) demonstrates a sense of attraction towards such new forms of learning.

4.3.2. Relating to place and one another.

As a multi-stakeholder course with a focus on learning *in situ*, the exercise of relating one's place and identity to one another was a strong theme acting as a lever for reflecting on one another's territory.

Place-based learning acted as lever to bridging societal paradigms with appreciation of local territories. Guillermo from ANUC noted how, *"We are so influenced by technology, this course grounds us in realities. Sometimes we do not valorise what we have; our love for our territory, the ecosystem."* This corresponds with what Yudy from the community *Camsta* reflected on, *"Today, society is moving so fast, things are so ephemeral, we are convinced of models so contradictory to what is our own, this system of consumption, consumption and to have more, this thought makes you forget who you are as a person, the most basic, your family...it is necessary return to knowing which territorial space you are inhabiting, where you are living.* This affection for place was also highlighted by student Angelica in reference to the youth on Las islas del Rosario *"I saw in Las Islas that the youth were the eco guides, who were focussing on the coral reefs, that the youth are appropriating their territory, loving their territory, they want to stay and not leave for big cities where there is less of a social fabric"*

The way that a place-based course bridged learning across cultures was highlighted by Alumni student Alejandra stating, *"I was very impressed by the associativity in the indigenous Camensta community. There was a moment when one of the older women was explaining how the family all gather around the shinyak to talk and discuss important topics. Getting to know their discourse and their interpretations, and the symbolic part is very beautiful–I liked it a lot because I have not heard such things before, I did not have this knowledge, and was left with the impression that they have certain things very well clarified, while ourselves, and the campesinos here* [in Filandia ANUC] *are lacking these clarities."* Guillermo from ANUC noted something similar through a reflection on the relationships in the *Camstza* community: "*The terms they use are always in the plural, "We are. We do. We make"..Here in Filandia there is a mentality of individualism, typical of the coffee region culture: the producer has their own coffee, own pulping machines. "I have this, I do this."*

This self-reflective environment created by the course is also witnessed by Yudy from the Camensta family, who noted that the course "*...has created a very strong reflection, because often we are working on certain topics, but we do not relate these topics to what is happening outside of our territory, as they relate to other communities. Reflections which we should take advantage of, knowledge and experiences that they have. What more could we do in our own territory? We have a plan to reach a vision we have, but what about the experiences of other communities. It gives a much bigger plan for what we can achieve."*

In summary, a focus on place and relations acted as a lever to bridging forms of learning *between* communities as well as with the university students through generating a strong reflective environment. This promoted participant reflections on their own connection to their territory through learning about other participants and their situations. At a *learning to know* level, Alejandra noted how the Camensta community gave her new knowledge about their discourse and interpretations of the world. Alejandra's reflection of the difference between the associativity between her region and the *Camenta* also came out strongly from Guillermo of ANUC, around the way they refer to each other in the plural. From the Ca-

mesta themselves, learning about other territories contributed to an *anticipatory learning*, of all the new opportunities their interaction with other course participants was opening up, also highlighting a desire for *learning to do* through building on the experiences of other communities.

4.3.3. The value of experiential learning.
This theme emerged from the project-based learning of the course, with virtual ICT course elements being balanced with face-to-face workshops, and the micro-projects of each community. In addition to the actual experiential learning which took place during the course (see section 4.2.5), this theme focuses on how the general appreciation for experiential learning acted as a bridge across the different participant groups.

The importance of connecting place to practical forms of knowledge was shared by Ever in Las Islas del Rosario: *"Fishing is declining; the local fisherman does not want his son to be a fisherman. And fishing is not just a productive and economic activity, but a form of transmitting knowledge, because it is a practical form of knowledge, alongside the oral transmission, the fisherman telling all the stories from his father, and grandfather. When the moon rises from this side, the best fishing area is here, as the current will work in this way, the wind will blow like this. And when these forms of activities become stigmatised, this knowledge begins to disappear."*

Ever spoke about how the course had helped develop the idea of setting up a living museum route on the island, which would recuperate local gastronomi such as traditional desserts by Dona Arnela, whose recipes were shared through the Whatsapp group. In the words of Ever, the living museum would *"empower not just the locals, but also those who visit. A space which can recuperate knowledge, but would also be educational in terms of sharing conservation and traditional culture. Creating respect for local culture, so that the tourist understands the space to which they arrive, and generate a dedication to the place."*

Student Angelica from the University of Quindio shared this sentiment noting the importance of academics getting close to territories and its people through practical collaborations. *"The peace agreement is very high up* [abstract from realities on the ground]. *We need practices that really generate peace that the territories are seeking ...to find out what they need, instead of us telling them what they need... the workshop with ANUC was very necessary for this* [see section 4.2.5], *to get to know each other, who we are, to see each others' faces, to understand more of what we are doing together. It is best way to operationalise the decolonial focus.*

Like Las Islas del Rosario, the *camesta* community have been actively working for a long time on a common project, and share a collective mentality on working together. While ANUC participants stressed the need to learn to work better together, for the *Camensta*, an important practical aspect of the course was studying. As camila stated: *"We are used to working together as a family, whatever needs to be done we make happen together, business or work. But we have never studied together, this was very distinct. First were the technological challenges. These we overcame together. Then my mother Emerenciana said 'you all work, and I will cook the food'. But we said "No", the idea is that we all study together, and help each other with the technology."*

In summary, a focus on practical knowledge and experiential learning acted as a lever to connecting students from the University of Quindio to projects taking place with ANUC through *learning by doing*. The practical activity of studying also acted as a form of *antici-*

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patory learning for the camensta family, giving them a new way of learning together. The development of the living museum route on Las Islas del Rosario displayed *learning to know* through the recuperation of old knowledge, but also *learning to be* through the desire for not only locals, but also tourists to create a dedication and connection to the project.

4.3.4. Intercultural communication & interactions.

This theme emerged out of the course focus on transdisciplinarity through the design of a multi-stakeholder course. The interaction between different cultural groups acting as both a lever and barrier to learning together about themselves and each other.

As a lever to bridging the diverse cultural contexts, Alumni Alejandra shared that she enjoyed the methodology of having three different communities each with "*their own cosmologia, ways of understanding the world. The course helped us understand each one of them*". Juan Juagibioy, a youth in the *Camesta* community noted how the course "*...made me think about all the other communities in Colombia that exist. The course helped change my perspective that it is not only Sibondoy, ourselves as indigenous people, but a great diversity of cultures, ethnicities, ways of learning.*" "Marcella" from Las Islas del Rosario stated "*I found it interesting to learn about other geographic spaces which I did not even imagine existed, and communities like the Camesta*". Yudy from the community Camsta reflected: *Every part of the world has different people, different characteristics, different way of thinking. Look at the peasants in Quindio, and the people in Las Islas, bringing them together they have something in common with us, we all complement each other, we are living on one earth, with one Mother, and if you were put in this place then it is because you need to respond to this place, protection, to serve mother earth, to care for her.*"

While the intercultural exchange acted as a lever to learning between communities and for the students, this was not the case for grassroots participants learning from the students. Although the students shared their appreciation for the course, there was little mention from grassroots participants of student contributions. Questioned about their involvement, Fernando of ANUC noted the student participation was important, but it "*could have been greater...perhaps because of their lack of experience.*" Guillermo from ANUC followed up on this remark with an interesting perspective: "*Many times the expert comes to the farmer and the farmer thinks that the expert knows more because they have been to the university. We are ashamed to say anything because we think we do not know. But sometimes the academic comes and lowers themselves so much that there no real exchange. The challenge is to speak at the same level.*" Graduate student Alejandra said something similar: "*More than from the point of being an academic sharing our knowledge to the communities, I felt we were learning more than we were sharing. One has to look at what one can contribute with, but one knows that one has a long path to go. The communities have been down a long path, and much more than just theory.* Student Angelica put it succinctly: "*The protagonist of this course was the communities themselves, compared to other courses where the protagonists come from outside. Outsiders come and present their knowledge. They are the ones telling the story, teaching the communities.*

A reason for this was provided by Alumni Alejandra who noted that the 'doing' aspect of the course was not complete. "*More time was needed for the course, and there could have been more gatherings, more themes to discuss between us, this was part of the reason we did not manage a good dialogue* with the communities... *so we learnt from them, got to know them, but did not manage to achieve the collaboration and interaction desired. The course should generate a strategy that the*

students, like the communities, could go through and reflect on the material together, as it ended up being an individual reflection [instead of a collective reflection].

In summary, there was good intercultural *learning to know* exchange between grassroots participants, and for the students, with a strong appreciation for opening up new perspectives on the diversity of Colombia. The quote by Yudy also highlights the affective *learning to be* relations generated between the grassroots community members. However, there was a perceived lack of affective learning from the community members towards the students, contributed to a lack of practical exercises (*learning to do*) between the students.

Section 5: Discussion

A major focus in socio-ecological transformations towards the Agenda 30 goals is identifying the levers and barriers to integrating different forms of learning and research towards practical on-the-ground change. Based on the framework of the transgressive action research (TAR) methodology, the Koru approach has been presented as an innovative approach to blending diverse learning concepts into a participatory, multi-stakeholder course which aims to valorise and bridge traditional, ancestral and academic forms of learning in the development of practical projects which support participant needs and requirements. In this section we discuss the themes of barriers and levers to bridging higher education and community learning, which emerged from 1) the development of the Koru approach; 2) the co-author narratives of how the course was implemented; and 3) focus groups on participants' attained learning.

5.1 Who are the course protagonists? Who needs to be decolonized?

The course focus of *Turismo* de Origin was to ground a decolonial discourse in the local contexts of the three participating communities, alongside a multi-stakeholder dialogue with academia and other civil society actors. Results show that from a learning-to-know perspective this was successful. ICT played an important role in facilitating the sharing of information between the different participants through the mediums of the virtual platform, the messaging service whatsapp, and the video conferences. This acted as a learning bridge between academic and non-academic participants in promoting the competence of critical reflection, which is an important part of higher education in addressing socio-ecological challenges [33]. In terms of decolonizing the curriculum, what could be termed marginalized knowledge from the three grassroots communities was made available and appreciated by participants. This was accompanied by the 'hands' based learning, where the workshops provided rich spaces for hands-on experiences of what a *Turismo de Origin* could look like, through the development of the seed projects such as the living museum in Las Islas del Rosario which reflected the local culture, local resources, and interests. Such experiential learning acted as a lever to learning across the participants as they became motivated and engaged in the course, as they can use what they have learned to do something that has an impact on others-especially their local community [255].

Yet from a 'heart' based learning perspective, the course evaluation by participants demonstrated a lack of affective relations between grassroots participants and students. If we think of heart-based relational knowing as the awareness of the relationships shared with com-

munity and the natural world [60], then there was strong relations built between the three communities. Yudy sums this up in section 4.3.4, "*Look at the peasants in Quindio, and the people in Las Islas, bringing them together they have something in common with us, we all complement each other, we are living on one earth, with one Mother.*" Yet this connection was not generated to the same degree with other non-community actors such as the students, with a lack of references to students in the focus groups with the three grassroots communities. From a curriculum perspective, graduate student Alejandra stated that the course was lacking sufficient collective activities to develop the conversations between the participants.

From a transgressive learning standpoint, there appears, however, to also be underlying power relations and inequities between the participants that acted as barriers to learning. As student Angelica clearly stated in section 4.3.4, the communities were the protagonists. They were the ones telling the story, instead of that role usually being assigned to the expert. This emancipatory approach to community learning perhaps contributed to what one student stated in narrative section section 4.2.2, "*Who am I to comment on 'other' forms of knowledge? Other participants come from communities where there is so much culture. I have nothing to contribute with.*" This suggests a feeling of marginality, a feeling that what one knows has less worth than someone else's, and does not deserve to be voiced.

It could therefore be argued that to some extent, the dominant form of western knowledge (represented by students and the Koru team) was exchanged for what was perceived as a more important form of community-based paradigm. This in effect meant swapping a dominant 'expert' paradigm with a marginal 'community' paradigm, which is a risk in decolonizing pedagogies [117,118]. This negates the objective of transgressing the forms of learning between the different participants. On the one hand, this suggests the need for improving the participatory design of the curriculum, focussing more on participation by the students in the design of the course, and including more innovative activities to connect students amongst themselves and to community participants. On the other hand, the lack of connection between students and community participants may also be due to the perceived fragile and marginalised nature of communities and their forms of learning. Although Le Grange [117] notes the importance of transdisciplinary knowledge in decolonizing the curriculum, addressing the replacement of one paradigm for another, there are clearly embodied power differences between participants of different backgrounds which make this difficult.

During a joint retrospective reflection between the co-authors of this paper, it was agreed that a delegate assessment and re-adjustment of power-relations between participants is needed to allow for a more critical discussion of knowledge forms and customs. In the future, this would include students from the beginning in the course design, helping to establish the necessary affective bonds and social ties between students and the grassroots communities that are needed to generate a more transgressive social learning process.

5.2. Knowledge and culture are never static

In light of viewing social learning as a *process,* co-author Tania Villarreal refers to the need to view knowledge as constantly changing through an exchange of ideas and practices. A focus on place and ICT technologies acted as levers to reflecting on the shifting nature of knowledge between participants With climate change affecting the natural world, it was an

interesting reflection from *Camestza* youth to question elders as to the extent to which birds, insects and weather can still be used in a biocultural calendar. The changing nature of the world highlights the importance of being careful not to romanticise a static vision of traditional and ancestral knowledge, but instead *"...giving voice to what tradition is today, instead of what it was in some distant past"* (section 4.9.3).

In a way, the anthropocene calls for responsive indigenousness, not so much by choice but by force, if indigenousness is to be sustained in and for the future [256]. This is displayed in the important role of youth in transmitting the role of technology to other Camensta participants. While Camensta elders were initially timid - making videos on their phones but not sending them - as the course progressed they became increasingly engaged, with Emerenciana from the Camesta community stating how to *"...move in the world of technology...will help give us some authority in the work we are doing, especially with the institutions we are working with."* Such examples encourage us not to romanticise a static view of indigenous customs, instead appreciating that indigenous and western knowledge have been interacting and evolving for centuries [257]. Ancient wisdom speaks of the connection to Mother earth, as Yudy so eloquently shares in section 4.3.4, yet just like academia is slowly changing towards increased openness to 'other' knowledge systems [22], traditions and practices are also evolving towards other forms of learning typical of higher education, highlighted by the Camesta family sitting down and studying together. The *Koru* approach therefore resulted not only in learning between participant communities, but also within them, highlighting the importance of sharing place and context for bridging experiences across participants, providing a setting for authentic experiences resulting in deep reflection [60].

5.3. Technology as a tool to increase social interaction and self-awareness

Technology facilitated learning is increasingly common in higher education, with interest as to how it can contribute to reflection and deep learning [258]. As explained by Barak [259], an important aspect of generating such reflection is the possibility of transforming the traditional role of the instructor as the main source of information and power, towards being a facilitator of the learning process. Beyond being an effective means in transferring head-based knowledge between the participants, technology acted as a bridge to generating *anticipatory learning* in the course, with the video-conference in particular being major success for many of the participants through co-researcher Tatiana Monroy facilitating the interaction between participants, opening up learning possibilities not before encountered.

Technology also contributed to critical thinking and self-awareness through promoting social interaction amongst the participants. This was illustrated through the example from Las Islas del Rosario, whereby 'Marcella' noted how the activity of using technology to record and share conversations from elders was giving a positive use to technology, and a voice to the elders.
At a reflexive level, Yudy from the Camesta rhetorically asked, *"What more could we do in our own territory? We have a plan to reach our vision, but what about the experiences of other communities? It gives a much bigger plan for what we can achieve."* Both these quotes highlight how the interaction between different participant experiences can act as a bridge sharing critical self-awareness between participants through challenging assumptions and limitations in their own contexts, opening up new possibilities and horizons towards community action.

Although not manifested in participant reflections, the co-authors of this paper have reflected on the risk that new technologies pose. On the one hand, the Koru approach is carefully designed to pay special attention to informed consent amongst participants, which is a sensitive topic in indigenous communities [119]. Furthermore, indigenous communities can positively adopt and make use of new digital technologies according to traditional knowledge [124], which we believe occurred during the course *Turismo de Origin*, as testified by participants, it is important to note the detrimental role technologies can play. On the other hand, technologies such as smartphones, can be highly addictive and form a distraction in educational environments [260], creating a distance between people and between people and place, that in the worst case plants the seed of the kind of system and culture that created the technologies which in the end might jeopardize the diversity sustainability is calling for [123]. The use of ICT needs to be critically assessed and continuously monitored in light of these risks.

5.4. Concluding remarks

This paper has explored what transgressive learning looks like in practice, and how a better understanding of the levers and barriers to bridging higher education and community learning can lead to learning ecologies that can be more effective in realizing the SDGs in a more systemic and interconnected way. SDGs provide an ambitious set of globally agreed upon goals upon which to work towards, but need to be grounded in place-based contexts, with a critical eye to tensions and paradoxes in interpreting them, and operationalising them in a holistic way.

From a curriculum perspective, we can see the Koru approach as a *"long and cyclical process involving many stakeholders as participants...in which motives and needs for changing the curriculum are formulated"* [261]. The Koru approach also presents a decolonized conceptualization of curriculum as a living ecology of learning. At least four characteristics of such a living curriculum can be distinguished from the enacted course *Turismo de Origin*, acting as levers to bridging higher education and community learning. First, the content is driven by existential questions that are grounded in local circumstances, with a focus on relations to place. Second, the learning spaces are not confined to those generally connected to an institution such as a school or university, but include more informal learning spaces in the community as well, connected through ICTs. Third, such a curriculum is responsive and dynamic in that it can adapt to the changing learning needs and demands of participants and to new perspectives, appreciating that knowledge and culture is fluid and changing. The latter also suggests that participants, including those representing formal education, need to be more anticipatory to surprise and emergence and inevitable element of uncertainty about where their learning pathways are going.

Finally, a living curriculum invites diversity and dissonance, in order to deepen the learning, recognize multiple ways of knowing and being in the world. This last element points to a strong structural barrier to bridging learning forms in that although confronting inequities and power imbalances is important, it is a fragile process which requires responsible and responsive ethos to fostering not just renewal of higher education [25], but also intercultural empathy.

Annex 1:

Focus group questions. Questions originally asked in Spanish (see original questions below). The translation is the first author's interpretation. Information in brackets is for the interviewers use only.

1. How did you experience the course [a general and open question to start the conversation]

2. How did you experience the diversity of sources of traditional / ancestral, academic and practical knowledge in the same course? What did you learn? Please provide an example. [*Learning to know*. Important to ask the necessary follow up questions to explore if the participants broke any barrier in their knowledge or way of knowing]

3 How did you experience the process of connecting with participants from other communities and backgrounds? Did this interaction help you learn? If so, how? Did this course in any way transform your way of understanding or experiencing the world? How? [*Learning to be*]

4. How did you experience the collaborative-practical process of the group work you were part of, and with the other participants, to generate tourism initiatives that address local challenges (workshops and videoconference)? To what extent has this course empowered you in your personal actions to generate transformations in your territories? [*Learning to do*]

5. Has there been anything that surprised you during this course, something you did not expect to learn? Is there anything else that you have learned apart from what we have already talked about? [*Learning to anticipate*]

6. What activity did you like best during the course? What activity do you not like? Which technological resource did you like the most, and which one did not? [Whatsapp, virtual learning platform, videoconference]

7 What was the biggest challenge you encountered during the course?

8 The aim of this course was to: *"Strengthen the capacities, tools and knowledge of participants in the development of community and sustainable initiatives of tourism of origin, through the recognition of local knowledge, appropriate technologies and organizational knowledge that are exchanged through the use of ICT for the generation of a specific product."* Do you believe that this goal was achieved? Why?

9 Do you have any suggestions to improve the course in such a way that this objective is achieved and your learning process is maximized?

Original questions in Spanish:

1 ¿Cómo experimentaron el curso? [pregunta general abierta como iniciador]

2 ¿Cómo experimentaron la diversidad de fuentes de conocimiento tradicional/ancestral, académica y práctica en el mismo curso? ¿Qué aprendiste, dame un ejemplo? [Sobre aprender a conocer, importante hacer las preguntas necesarias de más para saber si los participantes rompieron alguna barrera en su conocimiento o forma de conocer]

3 ¿Cómo experimentaron el proceso de conectarse con otros participantes de otras comunidades y antecedentes? ¿Esta interacción les ayudó a aprender, cómo? ¿Este curso de alguna forma transformó su forma de entender o experimentar el mundo?, cómo? [Sobre aprender a ser]

4. ¿Cómo experimentaron el proceso colaborativo-práctico de trabajo en grupo entre ustedes, y con los otros participantes, para generar las iniciativas de turismo que abordan los desafíos locales (convite y videoconferencia)? ¿Hasta qué punto este curso lo ha empoderado en sus acciones personales para generar transformaciones en sus territorios? [Sobre aprender a hacer]

5. ¿Ha habido algo que lo ha sorprendido en este curso, de lo que no esperaba aprender? ¿Hay algo más que haya usted aprendido a parte de lo que ya hemos hablado?

6. ¿Qué actividad le gustó más del curso? ¿Qué actividad no le gusto? ¿Qué recurso tecnológico le gusto más y cuál no? [whatsapp, plataforma virtual, videoconferencias]

7 ¿Cuál fue el mayor desafío que encontró durante el curso?

8 Este curso KORU tenía como objetivo: Fortalecer la conexión entre Sociedad, investigación y tecnología a través del reconocimiento del valor de conocimiento indígena local y la participación activa de diversos actores para abordar un desafío local común. ¿Ustedes creen que se alcanzó este objetivo? ¿Porque?

9 ¿Tiene alguna sugerencia para mejorar el curso de tal forma que se alcance este objetivo y se maximice su proceso de aprendizaje?

Appendix 5:

Embracing transdisciplinary tensions on the road to 2030

1.   Abstract

This collaborative chapter explores the emerging field of transdisciplinary research from the perspective of the social sciences, with the goal of raising critical questions as to the forms of knowledge co-production needed towards meeting the 2030 agenda for sustainable development. With transdisciplinary (TD) research promising to transcend disciplinary boundaries through collaboration between academic and non-academic actors, there are high expectations that such collaboration can address deep-rooted sustainability challenges. However, despite the increasing literature on transdisciplinary research, there remain significant practical and ethical tensions to realising transdisciplinary research 'in the field,' which often go unaddressed. Employing an innovative dialogical approach to highlight the multi-stranded perspectives needed for addressing sustainability challenges, this chapter weaves theory and practice through co-author narratives in answering the following generative questions: (1) How do underlying assumptions involved in TD research affect the research process? (2) How can TD research lead to enhanced sustainability outcomes in the context of the 2030 agenda? We contribute to the TD debate through highlighting the importance of surfacing the inherent tensions and paradoxes of diverse perspectives, values and knowledge systems in society, contributing to TD as a more reflexive practice for sustainability.

Keywords:
Transdisciplinary research, knowledge co-production, paradox theory, reflexive narratives, sustainable development, SDGs

1.   Introduction

This chapter explores Transdisciplinary (TD) research from the context of sustainability in social sciences, with the United Nations Sustainable Development Goals (SDGs) as a backdrop. We consider this contribution to come at an important time. As we write these words, reports are streaming in as to the state of the world: humanity has wiped out 60% of animal populations since 1970 [262]; inequality is increasing in almost all regions of the world [263]; and "rapid, far reaching and unprecedented changes in all aspects of society" are needed to limit global warming to 1.5ºC [31]. Although there is an increasing realization that both

personal and collective transformation must take place for such change to happen (O'Brien, 2012), the question of our time is *how* such transformations will take place?

In light of the 'wicked' nature of sustainability challenges [62], the main argument of this chapter is that there is a need to surface and address underlying tensions in conducting sustainability-oriented TD research. Confronting such tensions is a means to recognise the diverse perspectives, values and knowledge systems in society, contributing to TD as a more reflexive practice for sustainability. In the following section we begin by exploring TD research tensions through individual co-author narratives answering the question of how underlying assumptions involved in TD research can affect the research process. In section three, co-authors compare these approaches, with a specific focus on how such TD approaches can lead to enhanced sustainability outcomes in the context of the SDGs. Throughout these sections, the co-author narratives interact with one another in a dialogical way, representing more of a discussion forum at a conference, than conventional paper, mirroring what we consider are the multi-stranded and diverse approaches to TD research. In section four, we collectively analyse our narratives through the conceptual lens of paradox theory, highlighting the nature of the tensions in knowledge co-production between academic and non-academic actors, as well as challenges of bridging the gap between theory and practice in addressing the 2030 agenda for sustainable development. We hope that the conversational style and multiple voices in the chapter encourages the reader to critically engage with the issues raised, while keeping in mind that the questions have no final answers, and that this is an ongoing and evolving conversation.

2. **Carrying out transdisciplinary research in the field.**

Thomas Macintyre, community-based research in Colombia, South America

Situated in the discipline of Education for Sustainable Development, my research is focussed on the role of *learning* in addressing climate change and sustainability. I am inspired by decolonial approaches to education [117,264], and how the generation of learning ecologies within the framework of TD an emphasis the multiple forms of learning across different sectors of society [242,265–267]. As a TD researcher who is sceptical to mainstream higher education, I am particularly interested in how to co-produce knowledge *together* with grassroots initiatives and communities, contributing to epistemological justice [22]. My research is part of an international project called T-Learning, which works on reframing dominant narratives in education and learning [188].[36] Specifically, I am the lead researcher in the Colombian case study, based on Participatory Action Research (PAR), where our team is employing Transformation Labs to generate action-based change [see 13].

A characteristic of this PAR methodology is the close collaboration with members of grassroots initiatives in Colombia who are acting in the capacity of co-researchers in the T-Learning project. From my perspective, TD research encourages the transgression of dominant paradigms, and the exploration of novel collaborations between researchers and society. I see an underlying assumption of TD research to be the validity of different knowledge systems, while at the same time appreciating that knowledge is unstable, contested, and that

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36   'T-Learning' is an acronym for the international multi-case study project called: 'Transgressive Social Learning for Social-Ecological Sustainability in Times of Climate Change.' See http://transgressivelearning.org/ for more information.

we are only ever scratching the surface of how we understand the world [63]. Confronting such uncertainty requires creativity and innovation, with a strong focus on working together with people, communities and ideas that often seem foreign to us. Below I present an anecdote from fieldwork which highlights the tensions involved in putting these lofty aspirations into practice.

> "It was a cold morning in the Ecovillage of Aldeafeliz, situated one hour from the Colombian Capital of Bogota. After three days of participatory methodology workshops, with few hours of sleep, I was exhausted. But I was also excited. As part of a Transformation Lab we were conducting with co-researchers, Andres from the initiative Colectivo Talanquera was sharing with us an 'Indigenous technology' of energetic cleansing. In the damp morning dew, sitting on big stone overlooking the ecovillage, Andres explained the ancestral practice of rubbing small balls of organic cotton between our fingers, concentrating on imparting our negative energy into the cotton which was then 'planted' into the earth as an offering to Mother Earth. Despite having participated in such rituals before, I was still struggling to move away from the cognitive level of these exercises, to really give myself up to the 'silent knowledge' as Tatiana Monroy from Aldeafeliz calls the connection with the non-rational and emotional world. Put simply, I felt disconnected to this 'umbilical cord' to Mother Earth. As I sat on the stone, feeling cold and tired, I looked around at the co-researchers, all with eyes closed and looks of contentment. Many of them are leaders in their communities, navigating complex community dynamics in the search for social and ecological justice. 'How are they able to connect?' I wondered to myself. 'What have they experienced that I have not?' How can academics like myself engage in research contexts which we do not understand?'"

Textbox 1: Personal narrative by Thomas Macintyre

The above anecdote shows how working with people across different sectors of society has the power to disrupt our comfort zone, helping us reflect critically on who we are and our roles in society. The anecdote also demonstrates that TD research in practice is often challenging. On the one hand is the perennial challenge in action research of bridging the institutional requirements of a scientific investigation with the realities of community co-researchers in terms of time, motivation, and economic resources [20]. On the other hand, is the ethical dilemma of whether the underlying knowledge constructions of many grassroots communities have more to teach higher education institutions than the other way around. In my narrative above, as I sat on that rock twirling the cotton balls, trying to move beyond the cognitive so as to understand and learn this ancestral technique, no number of lectures or books could have prepared me for this situation. I was left wondering what my role really was as a researcher?

Sigurd Vildåsen: Corporate sustainability in Norway

Positioned in the field of corporate sustainability (CS), I have a particular interest in tensions and paradoxes stemming from conflicting requirements between social, economic and environmental demands [268,269]. The role of tensions is an interesting topic for discussion in the TD field in general, as exemplified by Thomas' account above of how TD insights challenge the classical perception of societal actors, and especially the role of higher education. As a way to embrace tensions emerging in real-life projects, and inspired by the work of Lang et al. [102], I ground my TD research on the assumption that companies must be involved in both designing the research questions introduced by academia, and providing

inputs to the knowledge creation process.

In the period of May 2014–May 2018, I was involved in a TD research process involving academia, the business sector, governmental organizations and NGOs. This was anchored in the project "Sustainable Innovation and Shared Value Creation in Norwegian Industry" (SISVI).[37] My research activities were performed in close dialogue with representatives from the company Plasto - a small manufacturer of plastic components - that contributed approximately 5% of the total funding of the SISVI project. In the period of September 2016–May 2017, Plasto's representative attended a workshop series with the title "SDGs–learning by doing," organized by the Polytechnic Society of Norway. Moreover, Plasto committed to discussing the SDGs in its management group, with the purpose of identifying the most relevant goals as seen from the company's perspective. Below I present an anecdote from this collaborative process.
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"In June 2016, I became involved with the board of the Polytechnic Society, a non-profit organization working to promote the SDGs in Norwegian Industry. For me, this was an interesting opportunity to link my collaborative research with the company Plasto, to a broader network of actors. Plasto's representative found the initiative promising, but he emphasized the company had to evaluate every extra activity critically due to a challenging market situation. However, to my surprise, he was able to commit the top management group and ran two internal workshops to draw on their viewpoints and experiences in applying the SDGs framework.

In December 2016, the Plato representative presented their lessons learnt at a meeting at the Polytechnic Society, where other companies also shared their experiences. Plasto's main message was that a company, in principle, affects and is affected by all the 17 goals, but this insight is challenging to apply in a practical context. For this reason, Plasto had decided to prioritize goals nr. 9 (industry, innovation, and infrastructure),12 (responsible consumption and production), 14 (life below water) and 17 (partnerships for the goals) in their further work. Moreover, they had established concrete targets, for example, with regard to using recycled materials in their production process.

After this interesting meeting, I started to ponder the following paradox: The SDGs are meant to represent a holistic framework, but companies state that it is impractical to work with all the goals at the same time. Is it feasible for companies to work on all SDG goals in an integrated manner? How can a company combine the practical need to focus on a few goals while at the same time ensuring credibility in their efforts by adopting a holistic perspective?

Textbox 2: Personal narrative by Sigurd Vildåsen

One of my underlying assumptions in the collaboration with Plasto is that my role as a researcher is to observe and analyse the activities of the company, acknowledging that this process will always influence decisions and perceptions of company representatives. Indeed, it is evident that I have influenced organizational actors since they were previously unaware of the SDG framework. However, I feel that 'objectivity' is not possible, nor is it an ideal, when conducting TD research. The researcher and practitioner interact and are active contributors in a relationship, in this case co-developing research questions, which in turn shapes concrete activities and the decisions undertaken in the project.

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37   See details about the project here: https://sisvi.no/

I acknowledge the risk that my role as a critical outsider can be blurred because of my close collaboration with the company. An example is a dilemma which developed for me, concerning the SDG prioritizations by Plasto. They have chosen to focus on a subset of the goals, which many would argue is a limitation since the framework is based on holistic considerations of all the 17 goals. However, my emphasis has been to introduce them to a step-by-step approach based on gradual learning on how to work with the framework. This is in line with my TD assumption that my role as a researcher is not to provide the "right" answers, but to encourage learning and experimentation.

Monica Ramos-Mejia: community-based research and corporate sustainability in Colombia, South America

Situated in the field of corporate sustainability (CS), I am interested in understanding the role of entrepreneurs in fostering sustainability transitions [270,271]. Here, grassroots entrepreneurs act as niche innovators capable of transforming production-consumption systems into more sustainable assemblages from the bottom-up [272]. Sustainability transitions researchers have frequently engaged in collaborative experiments with communities and local governments, aiming for novel socio-technical solutions [273]. These experiments are usually solution-oriented and entail TD research.

As mentioned by Sigurd above, non-academic actors are interested in finding solutions to their own contexts when getting involved in TD research. This contrasts with conventional explanatory academia whereby research findings should either contribute to, or challenge, current debates in the literature. Conventional research requires rigorous data collection and analysis, and is often understood as a well-defined linear process driven by a research question that originated from a research gap [274]. This difference can be seen in the following anecdote taken from my fieldwork in Colombia:

> 'Everything you've said sounds very beautiful, but it's a world away from what works here.' This is what an ecopreneur[38] told my colleague who was 'teaching' environmental management strategy at a training course aimed at developing business models for sustainability in rural Colombia. My colleague has had a brilliant academic career in corporate sustainability, however, despite her knowledge and experience, her points were considered out of context and thus irrelevant.
>
> The opening remark was an eye-opener for the research group I am part of, and invited a discussion into what knowledge is and who it is for: If knowledge is not useful for a group of people in specific circumstances, does it mean that this knowledge is not valid? Or does it mean the knowledge is not being appreciated? How can we co-produce knowledge that is scientifically valid and contextually relevant and useful?
>
> The questioning attitude of the ecopreneur mentioned above inspired a two-year process aimed at co-creating ecopreneurial ventures[39], in which an interdisciplinary team from the University of Twente (UT), the Netherlands (in which I was involved as doctoral researcher) worked together with grassroots innovators in Colombia to understand the local dynamics, resources and values underlying the innovation process.
>
> The co-creation process that unfolded was characterised by a knowledge dialogue in which grassroots innovators and academic researchers entered a reflection process that created room for translation between different realities and expectations. For instance, the rural energy enterprise on which one of the ecopreneurs was working developed a business model that reflects a combination of context-specific knowledge related to community-based organisational management and academic knowledge related to solar energy technologies for storage and distribution.
>
> Throughout the process, ecopreneurs used the concepts and tools they learned as resources to bring new technologies and social practices into the local landscape, with the deliberate intention of igniting changes towards sustainability. Similarly, the UT team experimented with innovative academic methods, strengthening its capacity to carry out transdisciplinary research.

Textbox 3: Personal narrative by Monica Ramos-Mejia

From my experience working with grassroots innovators, conventional research was indeed 'a world away' from them. Grassroots innovators were not interested in sustainable business model literature, but rather on how to develop business models that corresponded to their environmental and social concerns, while being feasible in the marketplace. As scholars, we were well informed about the debate, but lacked the experience of facing the everyday challenges that an ecopreneur has to deal with. The ecopreneurs working with us, on the other hand, were too busy sorting out everyday challenges to have the opportunity to adopt already available knowledge to solve their problems.

To address this research disjunction, the Dutch and the Colombian teams decided to engage in a co-creation process, facilitated by design science research methods, which are solution-driven [276]. The design process is experimental in nature, whereby the purpose is not to design one single solution, but many alternatives for action [276]. Furthermore, the design process highlights the insider's perspective rather than the observer's on the problem-solving process, meaning that the knowledge that seemed very distant for the ecopreneurs was translated and re-interpreted by them into local realities. The design process requires the researcher to be a facilitator, designing with all stakeholders involved. This highly participatory process is also iterative, making room for cycles of action and reflection, which to me was the key aspect of the process [277]. Sitting together to reflect on what

happens throughout the project loosens the tension related to the outcome of the research process. Furthermore, as is mentioned in the textbox above, both academic and non-academic researchers contributed to creating novel business models responding to context-specific sustainability challenges.

Sjors Witjes, corporate sustainability researcher in Europe and Latin America

Situated in the discipline of Corporate Sustainability (CS), my research is focussed on reflexive learning concerning the integration of sustainability in organisational systems. As organisations are accountable for their sustainability performance, I am motivated by accompanying them in the process of reflecting on interventions in the organisational system aimed at enhanced sustainability performance [278,see, for example, 279]. Inspired by engaged scholarship of Van de Ven and Johnson [280], I reflect on the situation at hand with organisational members with their practical knowledge bringing this together with my academic knowledge aiming for enhanced awareness and knowledge on how to improve the organisation's sustainability performance (Eccles, Ioannou, & Serafeim, 2014; Maletič, Maletič, Dahlgaard, Dahlgaard-Park, & Gomišček, 2016).

As a teacher dedicated to preparing future generations for their role in society, I am particularly motivated to integrate students from different academic levels in the reflection process on enhanced Corporate Sustainability [281]. Below, I present an anecdote from my research which highlights the tensions involved in putting this into practice.

> *I have just received an e-mail from a dairy company requesting academic reflections on the integration of sustainability into their organisational system by offering an internship for a master thesis student. The development and supervision of participatory action research on corporate sustainability at master level enables me to build bridges between the corporate and academic worlds. Although companies should take responsibility for their (un)sustainable actions, or pay for it by hiring additional staff or external consultants, I see a huge opportunity of combining the preparation of students for their future role in society with participation in a research project that aims at generating meaningful outcomes for the company as well as the production of knowledge contributing to debates on Corporate Sustainability. Furthermore, small-scale research projects based on Master theses have the potential to enhance a company's understanding of the added value of scientific research for improving corporate sustainability performance that could lead to bigger research projects in the future. Although academic-corporate research collaboration could create alternative funding schemes in a Dutch academic world experiencing reduced governmental funding for scientific research, it does generate tensions between knowledge production and the need for financial support. Although the outcome of the research project is used to reflect on improving corporate sustainability performance, there is the disconcerting risk of the research being used for corporate "greenwashing": in exchange for a company accepting academic research, the collaboration with a university can be used to show that the company is dealing with sustainability. Although I have signed many Non Disclosure/Agreements to ensure that I do not pass on company data, I have never requested a company sign an agreement to ensure ethical use of research outcomes. How can I be assured that the collaboration between business and academia leads to meaningful change, and not just window dressing for both actors? Although I trust my experiences with previous projects, and the positive appraisals from my company contacts as well as my academic counterparts, increasing academic/nonacademic research collaborations raise ethical as well as practical tensions which must be addressed."*

Textbox 4: Personal narrative by Sjors Witjes

As in the case of Sigurd and Monica, my research is based on a practical question from an organisation wanting to improve its contribution to the sustainable development of society. Like Sigurd, I aim at understanding the integration process of CS into business activities that can lead to CS becoming an added value with respect to corporate goals [see 282,283]. By applying participatory action research (PAR), the data gathering process is combined with supporting the company in making CS an integral part of their daily business activities and, simultaneously, enables the feedback of research outcomes between researchers and the company. This continuous reflection process is used to validate the research outcomes, as well as encouraging corporate self-reflection on CS as an added value to a corporation's future goals.

The collaboration between the researcher and the company in preparing and executing the research process is based on two assumptions: first, the company understanding and accepting the scientific method and research process as an added value resulting in corporate self-reflection. Second, the researcher understanding the day-to-day life in a company as a source of data. As illustrated in my personal narrative in textbox 4, this collaboration can, however, result in undesired outcomes: students carrying out menial jobs like cleaning floors for the company, or companies enlarging research outcomes for marketing purposes. Although corporate-academic collaboration can enable the CS scholar to be actively involved in transforming corporate society, the dilemma is that it could reduce the need for companies to take full responsibility for their potentially unsustainable behaviour.

3.   Comparing TD concepts and approaches in the context of the SDG framework.

The agenda 2030 SDG goals provide an ambitious global agenda aiming to *"free the human race from the tyranny of poverty and ... to heal and secure our planet"* [103]. With 17 goals aimed at transforming society in the fields of poverty, inequality, climate, environmental degradation, prosperity, and peace and justice, the SDGs provide a shared framework for addressing global sustainability challenges. In this section we will compare our TD approaches and assumptions in the context of the SDGs.

Sigurd Sagen Vildåsen: The SDGs help link local challenges to global challenges

Reflecting upon the underlying TD assumptions in the above section has led me to realize that the role of the researcher is a principal issue. The traditional perception of the researcher's role is to observe phenomenon and analyze mechanisms through 'objective' criteria. This passive observer role is something that most TD scholars would agree conflict the principle of interaction between academia and practice. However, interaction with practice could still entail a special role for the researcher, for example, by actively critiquing the behavior of industrial companies based on their sustainability performance. Personally, I believe that critical distance is crucial, especially in the field of corporate sustainability, but we do not own the truth as researchers and scientists when operating in the TD domain: we are legitimate actors in an ongoing knowledge debate. I find this perspective to resonate well with the SDGs and the Agenda 2030 framework because they address a broad array of societal issues, giving space for a large set of actors to converse.

In practice, however, actors in a decision-making settings typically represent different interests. In a workshop I co-organized in October 2017, as part of the Polytechnic Society, I ob-

served a representative from the organisation Transparency International promoting goal number 16, which deals with accountable institutions, as a way to counteract corruption. In the same meeting, several business representatives talked about goal number 12, focusing on the issue of responsible production and consumption. What I learned is that actors tend to promote a few goals linked to their own organizational interests. This creates a setting defined by negotiations, with each participant arguing their viewpoints.

Interestingly, even though actors promote different interests, it is possible to link their lines of reasoning. For example, if a workshop facilitator emphasises a holistic understanding of the framework during discussions. Indeed, the role of actors collaborating based on a common platform is reflected in goal number 17, which mainly is about partnerships between governments, the private sector and civil society to reach sustainability outcomes. In my research, I have seen goal number 17 being used actively by companies and other actors in the private sector, to facilitate collaborative projects. For example, I have experienced the framework as means for myself to ease the communication with Plasto's representatives. By referring to the SDGs it became easier to link the local activities of Plasto to global societal challenges.

Thomas Macintyre: The SDGs are meant to be critiqued and re-framed according to local contexts

Negotiating worldviews and visions of future activities, is one of the biggest challenges for reaching the SDG goals, and top priority for TD research and researchers. Despite the usefulness of the framework in concentrating the world challenges in concrete themes, as Sigurd mentions above, it is important to note that the SDGs are built on certain underlying assumptions. For example, goal number 8 states "decent work and *economic growth*," which is a contentious assumption given finite global resources [284]. With my own interest in more radical forms of learning which transgress inbuilt sustainability barriers, I therefore see TD research as a means to bring together different people and perspectives to discuss, critique and re-frame the SDGs according to local contexts and needs. Alongside a systems approach in implementing the SDGs [285], there is the need for a decolonial approach to sustainable development and transdisciplinary research [238].

This approach differs to Sigurd's approach above in which actors connect their interests to specific SDGs, and argue their own interests, rather than taking a critical look at the power relations and assumptions inherent to the different actors. Rather than a relativist approach where everyone holds the truth, I think it is important to take a more disruptive and critical approach, generating discussion about the extent to which, for example, a company's focus on only a few SDGs can address underlying structural barriers to addressing sustainability.

However, as my own experience on that rock on the ecovillage demonstrates (see textbox 1), although we may want to understand and experience other realities, we each hold entrenched values and ways of understanding the world which are difficult to transgress. To move effectively towards the SDGs, I believe we need to both negotiate differing interests while attempting to disrupt our own ways of thinking so as to better empathise with those we find it difficult to connect with.

Sjors Witjes: The SDGs require the continuous feedback between actors

I see the dominant paradigm of growth, mentioned by Thomas above, as a rooted belief in the corporate world. With corporate growth mainly reflected by key performance indicators representing quantifiable corporate processes impacting the SDGs, it distracts attention from qualitative social outcomes of informal processes, such as those represented by SDG 17. This relates to the tension of research 'greenwashing' based on quantifiable results, without considering qualitative outcomes. To avoid the potential abuse of outcomes, the aim of my research is to accompany companies in reflecting on their past and current sustainability performance from a quantitative and qualitative perspective in order to establish a more realistic strategy for improved future performance. In this way, my TD research approach can also be seen as corporate support as the research outcomes can also be used to improve corporate performance, and therefore, to contribute to SDG 12 on Sustainable Consumption and Production.

To ensure legitimacy of my research within the academic world, the participatory action research method I apply includes a continuous feedback between meaningful outcomes for practice, and knowledge created by a continuous collaboration between academics and non academics for a broader perspective such as for science. In this way, my research approach is similar to the ones applied by Thomas, Monica and Sigurd. By providing tools for companies to reflect on their sustainability performance, my research aims at changing the dominant paradigm in organisations from corporate growth towards a new development paradigm prioritizing the environment of which we all are part of [286]. As Sigurd writes above, I also see an important role for academia to enhance critical reflections in collaboration with non-academics aiming for the SDGs, and support companies to improve their contribution to a more sustainable society while being attentive to the possibilities of companies abusing research outcomes for 'greenwashing'.

Monica Ramos-Mejia: The SDGs must be translated and contextualised to co-create knowledge

Although there is general agreement on the desirability of the SDGs and their specific targets, there is little agreement on the means to achieving them. One of the reasons for this is the disconnection between dominant forms of knowledge and local realities. As I mentioned in textbox 3 above, mainstream Western knowledge may be alien for local realities in the Global South. When single knowledge systems prevail, solutions are usually not relevant nor feasible for local contexts. In this particular case, the assumptions and values that shaped the contents of the environmental management workshop did not match the context of our co-researchers. The contents had been developed for wealthier and more formal economies, operating under formal rules. The context of our co-researchers was characterised by informality and insecurity.

Like Sjors mentions above, TD research helps surface these differences through continuous and reflexive dialogue, where knowledge is not being 'transferred' from the academic to the practitioner team, but translated and contextualised between actor groups. Following Sjor's argument about organisations working towards inclusiveness towards contributing to the development of society, I would argue that something similar happens with communities when they engage in a TD research process. TD research creates spaces for knowledge forms to interact, even if this can be disruptive and confusing, like Thomas emphasises in his section.

In my case, the example of the rural solar-energy community-owned company demonstrated that despite the inefficiencies according to conventional key performance indicators in the sector, the cycles of action and reflection that emerged throughout the TD process made possible the translation between different knowledges, realities and expectations, resulting in solutions that were feasible according to local resources and capacities. This solution-driven and co-created knowledge is what could enhance sustainability outcomes in the context of the SDGs.

4. Discussion: TD approaches in knowledge co-production and action.

The common thread between the narratives above is the inherent tensions involved in integrating knowledge from various scientific and societal groups, and translating this knowledge into meaningful action. This has been explored from the perspective of community-based learning in Colombia, and corporate sustainability in Northern Europe. In this section, we carry out a collective discussion on how our disciplinary TD approaches can inform a more reflexive form of research that generate meaningful societal outcomes through embracing TD tensions.

To do this we will employ a paradox lens to explore how surfacing and addressing tensions are generative of new ways of understanding wicked sustainability challenges. Rather than juxtaposing opposite views, which can be weighed against each other, paradox theory takes a holistic approach, acknowledging that contradictory elements are interrelated, and can be dealt with through cyclical responses [287]. In line with earlier work on paradox theory by sustainability-oriented scholars [268,269], the following three sections each present a discussion of paradox having arisen in the sections above.

Trying to be participatory risks replicating inbuilt unsustainable structures.
Academic education is considered a key contributor in shifting the mindsets of individuals and society towards more sustainable forms of living [288]. At its best it promotes critical thinking and reflection. Yet in an age of scepsis to science-based claims, of which of the extent of human induced global warming is illustrative, science as a bedrock of progress is in question. As Sjors mentions in section two, academic institutions are receiving less government money, and having to forge alliances with the private sector, which is problematic in terms of negotiating competing interests. From a higher education perspective, Thomas also critically reflects on the limits of what are taught at the university, in comparison to life skills learnt out in the field. With decreasing funding and legitimacy concerns, academia is in desperate need to reinvent itself as a useful actor in society.

As transdisciplinary scholars, we have all shared the methodology of Participatory Action Research as a means to actively engage *with* stakeholders, and promote the co-creation of knowledge and action-based change at the local level. Yet a paradox evident in the narratives above is the extent to which our research really is *participatory*. The underlying assumption is that knowledge is a co-production process, relevant to both academia and non-academic partners. But what do we give back to our non-academic partners through our investigation? And how much are they actually participating in the research? As Thomas' anecdote illustrates, rather than a co-production of knowledge, the researcher was the one left confused, wondering what his role was in the community setting. Ignoring such unsettling encounters and only writing in academic journals about what experts know and understand risks replicating inbuilt unsustainable societal structures, with less tangible and unk-

nown phenomena marginalised in favor of dominant sustainability discourses. Much like the 'greenwashing' Sjors writes about in section two, reflecting on such paradoxes encourages us to question our own assumptions and worldviews. This is highlighted by Monica's anecdote, which shows how projects which bring academia and grassroots communities together have the potential for an intervention to be contextualised, and required skills and technical tools provided by outside actors [see 289].

By trying to be contextually relevant we question the scientific validity of TD research

The experiences brought by the co-authors above show the tension between scientific validity and contextual relevance. The former refers to robust methodologies and fluent dialogue with existing literature. The latter refers to practice-related challenges in specific contexts. Often, they do not match, which results, for example, in the practice-component being either overlooked or oversimplified by scientific approaches and conceptualisations.

The paradox arises when focusing on both the goals of scientific validity and contextual relevance. On the one hand, when a research project is transdisciplinary in terms of people, disciplines and fields, and directly related to the local context, there are more perspectives and, therefore, a more precise look into reality. However, the more diverse the group, the more difficult it is to agree on the process of co-designing, co-implementing or co-analysing the results in a scientific way [290]. On the other hand, although non-academic actors often feel more comfortable with simple and easy-to-picture models, complex theoretical frameworks are better suited to embrace more detailed data: the simpler the model the more variables it overlooks or keeps as constants. This is particularly relevant to contextualising research, where looking at spaces, scales and places (Truffer et al, 2015) or at the institutional diversity (Ramos-Mejia et al, 2018).

The generative aspect of this paradox lies in the fact that it is precisely this tension that nurtures TD research. If a TD group manages to deal with such difficulty, it is more likely that innovative methodological approaches are developed, as well as more comprehensive results achieved. For example, in the research project mentioned by Monica in section 2, the process became more relevant to the community involved when the academic members of the team stopped analysing each case separately from their own perspective, and started having meetings together to carry out the analysis collaboratively, creating a dialogue that transcended disciplinary boundaries.

By trying to be collaborative, we risk not being credible in TD research

The SDGs framework has become popular in societal discourse and most people would agree that it helps focus attention on global sustainability challenges. However, critics such as Spangenberg [291] argues that the lack of formal obligations leaves too much navigational space for individual companies to take full responsibility for their actions. As Sigurd's narrative illustrates, the application of the SDGs among companies tends to be at a high level of abstraction without clear linkages to daily operations. Along the lines of Sjor's reasoning, it is questionable whether the popularity of the SDG framework in the business sector is something that benefits society as a whole through actual results, or whether it is a means of avoiding stricter legislations by signalling future actions in a collaborative though uncommitted manner.

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Within this issue is the paradox between *creatively* bringing diverse actors together to address shared challenges, and the *credibility* of such collaboration resulting in action-based change. On the one hand, the SDG framework provides a common frame of reference upon which diverse actors can agree upon, in line with a pluralist epistemology [292]. As Sigurd argues, this enables creative learning processes, where for example business representatives can meet with NGOs to share social and environmental issues in a constructive manner. In many cases, companies do not have the competencies and motivation to evaluate SDG issues from a societal perspective, which places an important role on researchers to facilitate learning in TD contexts. On the other hand, discussing the SDGs in themselves do not lead to actual change, and the related multi-actor debate can result in superficial statements without committed agreements. Thomas shares his scepticism to companies only choosing a few SDGs to focus on, instead of focussing on the deeper systemic change which he feels the SDGs aspire to, and which are needed in society. The related knowledge stemming from such processes risk a lack of credibility whereby actions and measures signalled by companies are difficult to verify.

This paradox can be seen as an invitation to both academic and non-academic actors to be more bold in exploring innovative solutions to societal challenges. As all authors have stressed, tensions are natural to all collaborations between academic and non-academic actors. Beyond limited and resources [293], a source of interest are underlying assumptions and worldviews. The important aspect is to promote critical and reflective thinking through engaging in learning and feedback between diverse actors [294]. This involves challenging company representatives in how they understand the relationship between SDGs and corporate goals, and to challenge the TD researcher to be explore creative research methods, which capture the collaborative spirit, but which is also scientifically credible and meaningful to society. In this way, in the words of Sjors, we can promote a paradigm shift from business-as-usual towards a more inclusive and creative approaches towards developing more sustainable societies.

5. Reflecting on how to embrace TD tensions on the road to 2030.

The four co-authors of this paper have embarked on an experiment in collaborative writing in which we have seen the messy sustainability challenges as an opportunity to contribute to the TD debates around the need for more inclusive and reflective societies [287].
Through the multiple voices of the co-authors, we have explored how underlying assumptions involved in TD research affect the research process. The authors of this paper are in general agreement about highlighting the plurality of epistemologies present in society, highlighted by Sigurd noting that, 'nobody owns the truth.' For this reason it is important to accept the knowledge domains of other actors [295], as highlighted by Sjors in the need for companies and researchers to accept each other as valuable sources of information.

The narratives above, however, show that in practice this is complicated. Thomas struggles with understanding the 'silent knowledge' being explored with co-researchers, questioning his own contribution to the community he is studying, while Sigurd is left to consider the extent to which the company he is collaborating is will put the SDGs into actionable change. Sjors feels a tension with how student research(ers) will be utilized by companies. Taking the disconnection between academic and non-academic actors as a starting point, Monica's

narrative emphasis the TD assumption that research should be solution based, and shows how this assumption drives a desire for participatory action research, a methodology shared by all co-authors, which can address local contextual problems.

The question as to *how* such TD research can lead to enhanced sustainability outcomes produced more nuanced narratives amongst the authors. Sigurd stresses that although the SDG framework can result in only some of the targets being emphasised by actors, resulting in a negotiation between divergent interests, the framework can unite competing interests around a common language. This places an important role of academics to be facilitators and take the role of raising critical questions as to how the goals are interpreted. Sjors takes this a step further by arguing that the role of academia to generate corporate reflexibility around the SDGs that can lead to a paradigm shift away from an economic paradigm of economic growth, towards a paradigm of inclusivity. More critical to how this works in practice, both Thomas and Monica question the extent to which our roles as academics is really benefiting the realities and local contexts of non-academic actors. Thomas questions whether it is enough to just bring actors together to in inclusive collaboration, or if a deeper transformative process is needed. All authors are left with the question as to what extent meaningful transformations are taking place through TD research which can lead to more sustainable futures.

To conclude, the SDGs are without doubt a highly ambitious project. With its focus on its impacts "for all," through its universal applicability, it represents in theory at least, a disruptive break with the status quo. Yet as the narratives above show, transformations across sectors of society are not easy, with context specific realities contributing to complex socio-ecological challenges. It implies academic and non-academic researchers and practitioners to embrace the inherent tensions of working collaboratively with others who think and understand the world in a different way. This requires TD research to be a reflexive practice so as to shake up our mindsets, contributing innovative approaches to tackling these challenges. Its success will ultimately depend on learning to embrace inherent transdisciplinary tensions on the road to 2030.

Appendix 6:

Signs of transgressive learning in the Living Spiral Model

Definition of Transgression [42]:
1.The act of transgressing; the violation of a law or a duty or moral principle
2. The action of going beyond or overstepping some boundary or limit

Abstract
This empirical paper addresses the need for more in depth understanding of signs and characteristics of transgressive learning in a context of runaway climate change. In a world consumed by systemic global dysfunction, there is an urgency to foster rapid systemic change which can steer our paths towards meeting the SDG goals. The contention of this paper is that although there is a need for rapid change, it is fundamental to understand *how* such change can come about, so as to inform learning and curriculum design in a way that optimises learning situations. Anchored in the emerging field of transgressive learning, this article employs the innovative Living Spiral model to track critical learning moments by facilitators and participants in multi-stakeholder Transformation Labs (T-Labs), which took place in 2017/2018 in various grassroot sustainability initiatives in Colombia and The Netherlands. Through developing value-based signs of transgressive learning to code data, results demonstrate the importance of the values of 'addressing uncertainty', 'community', and 'relationality' in disrupting world-views through promoting reflexivity in participants and facilitators. It also shows the importance of further researching the power dynamics of 'absences' in transformative research so as to better capture the challenges of overcoming sustainability challenges.

1. Introduction

From times of old, the concept of 'transgression' has been used to forewarn believers of the dangers of overstepping the laws of the divine. A sin is a transgression against God, "*the violation of a law or a duty or moral principle*" *[42]*. We can see similar parallels with today's planetary crisis. Beyond the scientific debate, climate change is a moral issue, questioning our right to over-consume resources, disrespect nature, and put into disbalance the very earthly conditions which keep many species alive, including us. At a biblical scale, taboos have been broken, and as human induced climate change exacerbates the unpredictable forces of nature, another catastrophe is seemingly just around the corner.

Yet transgression can also mean something else: *"The action of going beyond or overstepping some boundary or limit."* [42] Rather than something inherently negative, this subtle difference highlights the crossing of boundaries and exploring what lies on the other side. How many of us have not wanted to learn new and impossible things, to challenge our limits, to do something that no one else has done? We can call the socially accepted way of doing things 'norms,' and they are the collective representations of acceptable group conduct. Norms keep society stable and organised, and resist change. Unfortunately, our current societal norms have left us in a sticky quagmire of unsustainable living. This is exacerbating climate disruptions, with climate change being hailed as the greatest threat to our existence [43]. There is little doubt that the status quo of the current economic paradigm and disconnection with nature must be heavily disrupted for mankind to develop more regenerative relationships with the environment [21].

Although not a common term in everyday life, transgression is often used to question norms and limits at the heart of evolution and development: from music [44] and fiction [45] to research policy [46] and education [161]. In this paper's context of climate change and sustainability, we are particularly interested in the debates around the dangers of *transgressing* planetary boundaries [28–30]. In order to mitigate the extent of this transgression, the IPCC states that "Limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society" [31]. For this to happen, the contention of this paper is that major shifts in mindsets, values and collective action is needed to move society in a more regenerative direction. Therefore more radical forms of learning-centered transformation are emerging [189], which, for example, the Intergovernmental Panel on Climate Change (IPCC) reports is strongly needed for climate change adaptation [27].

While the concept 'transgression' is often used quite vaguely to imply some form of boundary breaking action, the term has become a focal point in the ISC funded, international T-Learning project, which explores more radical forms of learning-based change for socio-ecological change within the framework of climate change [48,188]. Transgressive learning connect well with the fields of transformation studies and transition studies which are gaining increasing traction in the academic world. Rather than the buzzword 'change', with emphasis on external factors generating changes in society, there is the increasing realization that inner processes of personal and collective *transformation* are needed to tackle the roots of our unsustainable society. The T-Learning project has explicitly connected the concept of transgression with learning, highlighting a form of learning which seeks to disrupt norms and structures which maintain an unsustainable status quo.

The two questions we are answering are: What are the *characteristics* of transgressive learning in practice, and what are the *signs* of it occurring? We will explore these questions through the application of the Living Spiral model as a means for understanding and representing transgression in the fields of sustainability and climate change [66]. The research context for this paper are three grassroots community initiatives in Colombia, South America, and one such initiative in the city of The Hague in The Netherlands. The four initiatives share a focus on community organization and action-based change, and are all part of the international T-Learning project. Through a Transgressive Action Research (TAR) methodology [13], transformation labs (T-Labs) were held in each initiative, during which a critical event inquiry approach was carried out through semi-structured interviews to elicit significant learning moments by facilitators and participants. These were placed in different lear-

ning stages of the Living Spiral model, and analysed for value-based signs of transgression.

The paper is structured in the following way: Section two will provide the conceptual framework for this paper, focussing on the emerging field of transgressive learning, and will present the theoretical underpinnings of the Living Spiral model. Section three presents the TAR methodology, and the methods of T-Labs, alongside the critical event approach for gathering data. This section also presents the coding system developed to examine the date, and explains how the data has been analysed. Section four presents the results of the thematic analysis, presenting a table of value-based signs of transgressive learning, with representative participant quotes from the four T-Labs. Section five is the discussion where we go deeper into the *how* of transgression, where we finish with some some key conclusions and provides some suggestions for further research.

2. Theoretical framework

From the seminal work of Mezirow on adult learning in the mid 1990's [187], the field of transformative learning has blossomed. From the rational, cognitive and analytical approach of Mezirow, to more intuitive, creative and holistic focuses [296], there is a lot of interest in forms of learning which transforms how we understand the world. Yet a major challenge to transformative learning, and transformation studies in general, is the gap between the often grand rhetoric of *what* transformation is, and *if* and *how* it unfolds in practice [57]. We address this debate by first presenting transgressive learning as a more radical form of transformative learning which appreciates the ephemeral nature of knowledge. We then present the Living Spiral model as a means to understand and represent transgressive learning, providing the framework for how we will understand and operationalize learning in this paper.

2.1. The theory of Transgressive Learning

A review by Taylor in 2007 [297] discusses the new tendencies emerging in the field of transformative learning, such as the increasing focus on the problematic aspects of action, relationships, context, critical reflection, and power. Despite these new tendencies, some critics argue that the substantial theory-action gap renders transformative learning an unidentifiable phenomenon, instead preferring a more general term such as *good learning* [57].

In this paper we consider the essence of transformative learning to be useful - the shift in values and beliefs - but acknowledge the limitations this concept has in a messy world of global systemic dysfunction. We therefore present the emerging field of transgressive learning as a sub-branch of the transformative learning tree, which places more emphasis on emergent and transient forms of learning. The particular influences of transgressive learning can be found in reflexive social learning and capabilities theory, critical phenomenology, socio-cultural and cultural historical activity theory, and new social movement, postcolonial and decolonisation theory [48].

An important aspect of bringing the above influences together is how to learn in an increasingly uncertain and changing world. This signifies the need for an ontological turn from knowledge production to knowledge embodiment [25], and to 'being' in the world [248]. This calls for exploring integrated ways of knowing, being and doing in an increasingly uncertain world, and how these connect, such as the importance of critical awareness to the

emotional aspects of transgression [241]. Although we can say that all transgressive learning is transformative, as it deals with transformations in beliefs and practices, we contend that not all transformative learning is transgressive, as transformative learning has a tendency to not address the deeper 'wicked' nature of sustainability issues characterized by their complex, fluid, and transient nature. The following are some common characteristics of transgressive learning:

Characteristics of transgressive learning

1. Ethics of transgressive learning is based on a philosophy of caring which balances the warrior stance of activism with the empathic pose of vulnerability.
2. Transgressive learning, based on disrupting structural hegemonies of power, is a form of transformative learning.
3. Transgressive learning addresses wicked sustainability issues characterized by their complex, fluid, and transient nature.
4. Transgressive learning as a methodology is normative and characterized by "ecologies of knowledge."
5. With their emphasis on participatory, reflective and narrative approaches, transgressive methods are performative by nature.

Table 1. Characteristics of transgressive learning (based on Macintyre and Chaves [12])

One of the first people to use the term transgressive learning was bell hooks [49], in her pioneering work in the field of critical theory and feminist thought in the classroom. This has led to further research on transgressive learning in teaching pedagogy in (higher) education [48,50–53], as well as the transgressive role of the researcher in decolonizing research practices [12,54].

Building upon this earlier body of work, the T-Learning project has been exploring how transgressive learning can help address the learning challenges in the nexus issues of climate change. The T-Learning team has co-defined T-Learning as "*a regenerative, conflictive and hopeful process which involves diversity and drives changes in stubborn cultural practices and identities for sustainability, and triggers change for sustainability in times of (dis)comfort at different levels, scales and in spaces.*" [14].

2.2. The Living Spiral model

Transgressive learning makes a strong case for connecting theory to practice. As highlighted by bell hooks, critical thinking and theory need to be firmly rooted in practice for transformative power to be visualised. In the words of Lotz-Sisitka and colleagues [249], transgressing norms can be viewed as reframing and transforming embedded practices in order for sustainability to emerge. Important for such reframing to take place is experiential learning involving dissonance and disruption to encourage participants to leave their comfort zone and personal boundaries so as to embody transgressive experiences [80,298].

A means for reframing sustainability and transformation in the T-Learning project has been the use of narratives and metaphors. At an early stage of the T-Learning project (2017),

colleagues came together for a cross-case study workshop, and developed the Living Spiral model (see figure 1 below), based on theory of change literature [299,300]. The Living Spiral model presents learning as a spiralling, organic process made up of distinct learning stages. These learning stages can be compared to those of the 10 learning phases put forward by Mezirow and associates [74], but follow the ecological metaphor of a generic plant. The learning stage of the roots, for example, recognises the cultural/historical context of a learning process, and like a plant, provides the platform from which the rest of the process is based on. On the left side of the model below are the elements which connect the learning stages together. The learning stages are connected through *processes*, but in line with the messy nature of socio-ecological transformations, involve *barriers*, which act as lock-in mechanisms [64], as well as *invisible processes,* which represent transformations which appear hidden and unidentifiable. Important for the inclusive and reflexive nature of transgressive learning is *active absence*, which can refer to real things which are absent, such as actors or perspectives excluded from a learning process, as well as at the ontological level of learning 'what is not yet there' [38]. As a means of visualizing the Living Spiral we will identify the *moments* through critical event inquiry.
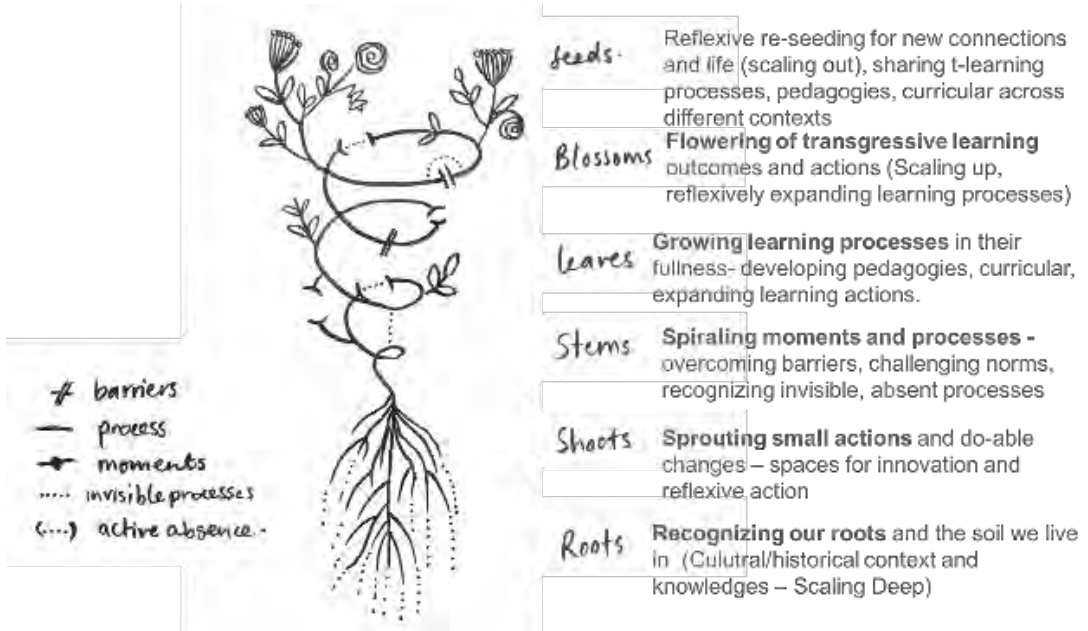

Figure 1. The Living Spiral model. Taken from Macintyre et. al. [13]

Through the sharing of fieldwork experiences amongst T-Learning partners, the lead author of this paper, alongside two T-Learning colleagues, have developed the original model above into a comprehensive framework for generating and analysing transformative narratives [66]. The Living Spiral model, and the framework around it, was first presented in a paper on climate change narratives where the metaphor was used as a practical tool for eliciting co-researcher narratives on the transgressive learning qualities needed to respond to climate change [13]. The model has also been used at a workshop for early career researchers exploring personal transformations in the context of their research [105].

Having thus previously demonstrated the potential of the Living Spiral model to generate transformative narratives, the objective of this paper is to use the learning stages and lear-

ning elements of the Living Spiral model to identify signs and characteristics of transgressive learning taking place in transformative environments. This makes tangible what transgressive learning is and how it might occur, with the contention that these examples and insights can help educational practitioners and academics to support processes of transgressive learning in their own environments.

3. Methodological Framework

The methodology of this paper is based on Transgressive Action Research (TAR), which was developed during the Colombian case study of the T-Learning project [13]. In line with the call for more research that simultaneously engages action research and transformative learning to better understand their relationship in terms of dialogue, reflexivity and the need for action [297], the TAR approach merges transgressive learning with action research, actively working with co-researchers from studied communities through Transformation Labs (T-Labs) to address shared socio-ecological challenges. What follows is an explanation of the T-Lab method and the case study locations which forms the context for this research. We will also present the method of critical event inquiry which was used to illicit the data for this paper, as well as the method of thematic analysis using value-based indicators to analyse the data.

3.1. Transformation Labs (T-Labs)

The context for this research were T-Labs carried out by co-researchers in the Colombian and Dutch case studies. T-Labs are specifically designed to guide transformations in social-ecological systems towards sustainability [88]. T-Labs form an integral part of the T-Learning project and the TAR approach, generating spaces and processes of action and learning-based transformation. T-Labs emphasis the importance of context, whereby through methodological workshops which took place in Colombia, T-labs were co-defined as *"pedagogical spaces and processes of restoration and potentialisation of sociocultural tissues in territories. They are developed in living, diverse and intercultural learning spaces giving new reference points and regenerative tools"* [225]. It is important to note that T-labs are understood as processes which take place over longer periods of time, but which have specific workshops during their course, which in this case was where the interviews were carried out. The following is a brief description of the T-Labs held in the studied communities where interviews with organisers and participants was conducted:

Name	Location	Description
T-Lab 1: The Call of the Mountain	Itinerant. In the year 2017: Ecovillage Anthakarana, Quindio, Colombia	An annual intercultural gathering organised by the CASA network [80], bringing together a diverse collection of people, communities and projects for five days of communal living, in which participants exchange experiences on sustainable living while partaking in working councils, workshops, panel discussions, dances and other artistic pursuits [80].
T-Lab 2: Ecovillage AldeaFeliz	San Francisco, Cundinamarca, Colombia	Aldeafeliz is an intentional community of 12 people, founded in 2005. T-Labs focussed on connecting ancestral technologies with modern social innovation tools, for example in the form of eco-construction, generating cohesion and action around territorial water conservation.
T-Lab 3: The Islands of Rosario	Las Islas del Rosario, Bolivar, Colombia	The T-Labs held in the afro-Colombian community were based on networking community initiatives in the caribean region. This included workshops providing tools for implementing sustainable systems in local contexts, such as non-violent communication, alongside practical courses in agroecology.
T-Lab 4: Lekker Nassuh	The Hague, the Netherlands	A community initiative that focuses on sustainability around a local food system. T-Labs focussed on reflexion workshops around organisational principles of running the initiative.

Table 2. Characteristics of the T-Labs held in Colombia and the Netherlands

3.2. Critical event inquiry

As a narrative tool, critical event inquiry is a valuable source of qualitative information [301]. This approach understands human existence through stories which have critical significance for participants, and has been employed as a research tool in a range of teaching and learning settings [109]. With focus on the potentially 'transgressive' nature of the learning taking place, an emphasis was placed on an 'inquiry of discomfort', so as to identify and promote a transition from dualistic and norm-based subjectivities towards more ambiguous engagement with social realities and experiences [72].

Data was collected through a total of 18 semi-structured interviews carried out in the four initiatives (see appendix one for interview questions). T-Lab participants and facilitators were interviewed about significant moments during the T-Labs, and the extent to which they were transformative (where we define transformative learning as a change in reference points, and world-visions). Considering the importance of context in transformative learning [108], the interviews were carried *in situ* at the end of each T-lab, supporting a situated practice by the participants.

3.3. Thematic analysis

This paper focuses on softer 'signs' of transgressive learning, characterised by less tangible attributes. This is in line with the recommendations to focus on how transformative pro-

cesses can inform learning and curriculum design, rather than an assessment of whether transformative learning has occurred or not [108]. This appreciates that focussing on the *process* is important if we want to improve how we teach and learn from one another, leading to empowerment and positive change, rather than measuring up to the theoretical ideals of what transformation is or could be. For this reason, the T-Learning project has preferred the term 'signs of' instead of 'indicators of' to shift away from the tendency towards measurement and quantification which can get in the way of the kind of emancipatory learning that is advocated.

Signs of transgressive learning amongst subjects was explored through thematic analysis of interview data [99], using the software NVIVO. The first step involved coding transcribed interview data using prior research driven categories of the six learning stages, and learning aspects, as visually shown in figure 1 above. This initial coding was carried out by author one, and verified by co-authors two and three. The second round of coding involved the first author inductively coding the first round of coded data through developing value-based themes inspired by Dahl [107]. This first set of value-based themes was discussed between the three authors, whereby the original 30 themes were collapsed into 11 themes, presented in table 3 below.

Value theme	Characteristic	Sources/References
Acknowledging uncertainty	Disrupting the status quo of what is normally understood and accepted through addressing and adapting to what we do not understand, often by acceptance and letting go	16/41
Collaboration	Forms of working together, such as through social technologies	10/12
Communication	The way we share or exchange information	5/5
Community	Being part of a group with common characteristics and valuing the greater good of that group over the individual	14/30
Diversity	Focus on multiplicity alongside inclusivity	10/20
Education	Reflection and learning	12/21
Optimism	A sense of positivity through inspiration, compassion, and appreciation	10/17
Order	Planning and design, for example, to ensure safety or to reach goals	13/27
Practice	Hands-on experiential learning, for example through experiencing novelties and local development	13/28
Relationality	An understanding of how everything is connected and related to on another, for example, typical in ancestral knowledge and spirituality.	12/39
Responsibility	Commitment and leadership	9/15

Table 3. Themes derived from second round of coding, with their respective characteristics. Each interview refers to one source, and each reference corresponds to a coded segment of an interview.

4. Data analysis: Results

This results section analyses the themes prevalent in each of the learning stages/elements of the Living Spiral model, with representative quotes from each of the four T-Labs.

4.1. Roots

We define roots as the recognition and reflection of one's own 'place' through cultural and historical context. Roots are important because they ground a person in the present, alleviating the stress of disconnection in an increasingly complex world. Expressions of learning taking place in this stage was the subject mentioning the experience of connecting to their history, culture, or location.

The dominant values which emerged in this learning stage were that of 'community' and 'diversity'. The importance of belonging to a community was stated by Edgardo in the T-Lab in Las Islas del Rosario:*"One has to have a sense of belonging. If I am not aware of things, recognizing myself, then what am I doing?"* This assertion of discovering the community one belongs to was shared by facilitator Tatiana Monroy in the Aldeafeliz T-Lab, during the eco-construction T-Lab which involved rebuilding the ceremonial house in the community:*"In this moment that we are in love with indigenous cultures, we construct a house and learn about indigenous cultures. But there comes a moment we have to ask ourselves, "who are we?" Are we Indigenous? Are we urbanites that want to learn from the Indigenous world? or are we a blend?*

The value of 'diversity' was strong in providing a base for transformation. Participant Carlos, in the Call of the Mountain (CotM) event noted that what impacted him the most was *"the encounter with a collective of people who are weaving a network of relations. This experience of weaving, and being part of a network has changed my world vision, the possibility to feel that there are people all over the world working in the same direction"* Likewise, in the Lekker Nassuh T-Labs, the connection between diversity and community was shared by participant Anubav, *"for this community, the most important part was to have a mix of people who fill in all the gaps and to be able to work together... with empathy and compassion and understanding."*

Just like in nature, where the roots of diverse trees interconnect, sharing information and nutrients together in a wood-wide-web [73], this learning stage show the importance of belonging to a greater community, where diversity and reflexivity about who we are provide a foundation for transgressive learning to take place.

4.2. Shoots

Moving out of the soil are shoots, which are the materialisations of small actions and doable changes. Shoots have the potential to develop into further transformations, absorbing nutrients via the plant's roots. Signs of learning taking place at this stage involves the subject mentioning a concrete action they were part of which was significant.
The dominant thematic values which emerged in this learning stage was 'practice.' Facilitator Margarita, in the T-Lab in Las Islas del Rosario, notes the importance of transformative practices taking place in the context of the community: "*I could have talked about facilitation and ecovillages in a hotel in Cartagena* [main city close to Rosario Islands]*, but giving the T-Lab here in the community, talking about eco-hotels, while people are staying and living what*

the eco-hotel concept can be, construction materials, what food is provided, what the community is fighting for in the territory, it all turns into a pedagogical experience, not just a workshop." This sentiment of carrying out actions together was shared by participant Victor in the Aldeafeliz T-Lab *"One of the big impacts was the form of living together, and constructing together in small spaces. Managing to avoid conflicts, the social part, where there is tolerance, and living together with the community."*

Participant Yuluka in the CotM T-Lab, shared how such place-based experiences can be embodied: *"It affects your ability to act, or not to act. If the territory is sunny, beautiful and calm, then you feel good. But if there is intense rain and you cannot walk because there is so much mud on your shoes, then you need to get something out of yourself, something inside that you do not know about, because you have not experienced it before, and this search for the strength to continue is a strong effort."* The motivational aspect of embodying transformation was reiterated by participant Anubav in the Lekker Nassuh T-Lab, *"I think maybe the biggest factor was working with people who are doing it to just do it. And they're not doing it for an ulterior motive ...to earn money or get respect or power. They just do it because they want to make the world better, and they want to embody the change that they want to see in the world. And to work with such people has really been an eye-opening thing for me and has enabled me to bring that out more in myself... I think that is one of the main factors that has enabled my transformation."*

Acting as 'germ cells' [64] emergent in our processes, we can see how context contributed to the importance of practices embodying transformation, as well as providing motivation for other participants to partake in transformational processes.

4.3 Stems

The learning stage of stems develops if the previous germ cells are able to challenge and overcome the structural barriers to their realisation. Rather than learning *stages*, the following subsections are the learning *aspects* involved in the transition between learning stages, located on the bottom left of figure 1 above.[38]

4.3.1 Barriers

Barriers are lock-in mechanisms that make change difficult. These may be cognitive, cultural, and/or structural challenges to realizing meaningful transformation. Expressions of learning taking place here occur when subjects mention confronting dominant paradigms and ideas which they consider as barriers to promoting wellbeing at the individual and collective level. The dominant value themes emerging were 'acknowledging uncertainty', where a strong sign was the disruption taking place in the T-Labs, and valuing 'order' through design-based approaches to community.

A clear cultural barrier in the context of the T-Lab in Las Islas del Rosario was explained by participant Maria on the prejudices in her community. *"We have become accustomed from the colony that"negro no le cree a negro"* [black does not believe in black]*, therefore we believe the one who arrives from the outside* [usually white]*... everyone follows that person, because that person has to know more than ourselves, even though we are from the community."* The inbuilt

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38   The learning aspect of 'moments' has not been included as the interviews were based on these 'moments' in the form of the critical event inquiry.

prejudices of society are also mentioned by participant Carlos during the Aldeafeliz T-Lab, concerning the implementation of ancestral, eco friendly construction methods. *"We have the idea that what rots in bad. Then we learn from this indigenous technology that rotting is part of the design, and this can result in a longer-term structure, involving the cycles of nature. This is a revelation. A logic of a house as living, instead of eternal."*

Experiencing something disruptive as a means to motivate the opening of one's mind was shared by facilitator Yuluka in the CotM T-Lab, concerning her interaction with the Indigenous Misak people: *"It is a little incomprehensible for us, as westerners, because in the moment of sitting down and talking, the basic principle for them was that Mother Earth was alive, and everything that happens around us in is terms of living entities. To open the mind to the possibility to this comprehension, from the perspective that they live like this, was amazing."* Although disruption may be an enjoyable experience, is may also be more difficult, as Lekker Nassuh T-Lab participant Liselotte shares in the initiative's attempt to overcome the barrier of hierarchy in their initiative: *"We did not have any hierarchy and everything was possible until things didn't really go as planned. And the feedback of that was, we're going to have structure and rules. That really opened my eyes in the sense that it made me realise that everything on this earth, not only living beings but also systems, they're created in such a way as to survive... everybody is trained to live in a hierarchical society. So, when we say we're going to drop this, it's going to kick us back because it wants to survive."*

Barriers are a natural part of all learning stages, kept alive by societal norms which attempt to keep society stable and ultimately to 'survive', as Liselotte describes above. Finding order is a strong theme in addressing these barriers, and ironically, in a transformative context, this means valuing disruption and uncertain situations where new forms of order can be experimented with. As participant Sebastiaan, in the Lekker Nussuh T-Lab states, *"we run into resistance, within ourselves or within the community... each moment that could be transgressive to me has something to do with blockage or resistance being solved in a way."*

4.3.2. (Invisible) processes

Processes highlight how learning stages are interconnected in a spiralling organic process. This appreciates that transformative learning is a lifelong and oftentimes disruptive process, rather than a linear notion things that can be 'learnt'. The 'invisible' aspects of processes are the tangible but invisible threads which connect learning stages together, but require different perspectives and innovative thinking to recognise and understand them. Acknowledging uncertainty was once again the dominant theme which emerged in this learning aspect.

The uneven process of transformation was highlighted by Margarita in the T-Lab in Las Islas del Rosario. *"Another transformative aspect was then letting go of the rhythm. After many things have happened, where there has been a big effort, there is then a contraction where things are processed, becoming sediment. It is important to leave a space for silence, the void, to allow for what is coming next. The first T-Lab was an inhalation, then after this first breathe, we left time for maturing."* This maturing in the process was mirrored by participant Andres at the CotM T-Lab, who noted how the smaller event in 2018 had led to more meaningful interactions with other participants, with more possibilities to learn about people's life processes, or other projects of people who participated. *"The possibility to have this contraction of the spi-*

ral, to review the purpose of the event, the 'why are we doing all this?' It gives much more sense for what we want to do in the future, it permits us to find an order, find a familiarity that permits us to articulate ourselves more affectively, to be able to reach our collective goals. The rhythm of transformation was also highlighted in the Lekker Nussuh T-Lab in the Netherlands, where participant Frederik noted the initiative's acceptance of having to slow down. *"We don't have the capacity to do this. And, I think, from that moment on, together with Liselotte and Sebastian, we said to ourselves, as an organization which is beginning, we should not do anything that is beyond our capacity. We should really be very conscious of our own internal pace, and judge anything we want to do against our ability to do things"*

In terms of invisible processes, participant Carlos in the CotM T-Lab described his understanding of the transformative processes he was going through: *"the mysterious processes of life that cannot be explained, we have the illusion of knowledge that we can find answers, but in reality we are living in a transcendental moment."* Facilitator Eber from the T-Lab in Las Islas del Rosario also noted that *"We want transformations to not only be in the physical, but also in the spiritual; that the same 'being' with all its feelings are transforming, not only changing the clothes. In other words, not just transformation on the outside but also on the inside."*

To summarise, a strong theme in the learning aspect of processes was the appreciation that transformation takes place at different rhythms, and in all the examples above, the learning outcome was that it was necessary to slow down, reflect on the process, and connect one's inner purpose with what was happening in the initiative.

4.3.4. Active/passive absence

This learning aspect addresses the need to recognise actors, ideas and knowledge which are excluded and hence marginalized in a transformative process. Absences are passive when such exclusion is accidental, not premeditated. Absences are active when the actor decides not to be present, or when a specific perspective is deliberately not taken into account. This learning aspect was represented by the value of 'practices', in terms of novel ideas and skills being present.

At one level, we can see how T-Labs filled absences by bringing new ideas to initiatives that were absent before. Edgardo from Las Islas del Rosario shares an important moment in the T-Lab when the T-Lab facilitator *"...explained to us that we were going to build with wood and with the straw, and not with tile nor cement. Because I am seeing that in the future my children and grandchildren can live in a less polluted country, it is not only living with money but with what nature is giving us. Before I had not thought about this because I had a lack of this information."* Facilitator Tatiana in the Aldeafeliz T-Lab noted that *"...in social aspects, with the construction of a culture of peace, of a social fabric, the T-Labs have contributed a lot. The capacity to sit down with one another and translate our experiences, what we have lived, the possibility to eat together - a peasant, a politician, to talk about the opportunities in the territory. The practical exercises in the T-Labs have helped us communicate. These T-Labs visibilise the people who are interested in the topics, who are we, what are we doing? How close, or far away from each other are we? What do we each know, and how can we share this knowledge. It inspires us to get closer to our territories, and see what we can do in our territory."*
Although the value of 'practices' was present in this learning aspect, whereby participants appreciated new, concrete information and ideas for sustainable living (i.e. filling in absen-

ce), there was a noticeable lack of participant references to more politically charged understandings of 'absence' such as blind-spots, marginalizations or people left out or excluded from the T-lab processes.

4.4. Leaves

Leaves evolve out of stems through barriers and tensions being overcome, resulting in the grounding and growing of learning processes. They represent energy for the process to continue over time. Examples of this are when subjects refer to learning activities which become periodical and generate solid, long-term changes. The dominant theme emerging was 'order'.

CotM participant Andrea emphatically noted the theme of order resulting in an impetus for a long term process: "[The Call of the Mountain] *event told us "continue! Continue!" We are many, this is happening, this is a reality, and this means to be around the fire and in a circle, and it really works, this is a technology that sticks, relations become a fabric, from the soul, and there are people I met there that I maybe will never meet again, but we are still in contact. Something came together*". The importance of the structure of the circle as a facilitation tool was also shared by Facilitator Tatiana in the T-Lab in Aldeafeliz:*"During our conversations, some of the neighbours* [participants] *managed to confess that they were having problems with each other, but they felt like they were in a safe space. They were saying 'yes we have problems but we are going to be able to resolve them'. These participants gave a lot of significance to the circle, to be able to speak about issues, not leaving things unresolved, to permit that the vulnerability emerges. During an interview I carried out with a neighbour afterwards, the neighbour recognised the talking circle as a very important space where he had learnt to communicate with others. For me it gave a reference point for another way carrying out things."*

Having explicitly addressed the barrier of hierarchy, Frederik from the Lekker Nassuh T-Lab describes how the process began to expand after recognising that the initiatives was going to need structure, and more individuals to take responsibility.*"From that moment on, we were not going to do everything anymore. Anybody who wanted vegetables was going to have to contribute in some way or another in terms of time. We knew that this would have a drawback and things would go less quickly...but it would be more balanced, and that worked. That was the time we created the foundation. It was the time we started to have our finances and accounting in order. We started to make something of a structure. Without that it would have collapsed within a month. And we would have all parted as enemies."*

The examples above demonstrate the importance of developing a structure which works in an initiative. Such a structure can be motivational in learning new ways to communicate and learn from one another, as well as promoting important values such as responsibility to a process.

4.5. Blossoms

Blossoms and fruit appear when a process has been successful, both at the level of the individual and the community. At this stage the process becomes an example for people from outside the process who arrive, learn and become inspired, thus pollinating other processes and fertilizing new ideas. The dominant theme that emerged in this learning stage was that

of 'education', especially the subjects' ability to reflect on their learning process throughout the T-Lab.

Participant Manual, from the T-Lab in Las Islas del Rosario, shared an experience which helped him value communication:*"We carried out the exercise of a doll on the floor, with a name on it's head, where one should express* [to the doll] *how one is feeling, learning how to communicate with another person, without rudeness, willingly. I have learned how to solve conflicts here... one learns to listen to people, to communicate well. The change was that before* [the workshop]*, I did not take care of my territory like that, I did not like going to gatherings, but this gathering inspired me and filled me with wisdom, how to take care of a territory."* Participant Victor, in the Aldeafeliz T-Lab shared how the T-Lab was inspiring the local neighbourhood*"as a pedagogical school, where people go to visit, working towards the caring of the local area, the tourist comes and visits, they are not degrading the land, they are caring for the water, flora and fauna. At the level of the municipality is it interesting, because they are noticing us, that there are grassroots communities that are thinking about what is healthy, in terms of production, which in the long term influences the minds of the neighbours and the neighbourhood"*

This flowering of a process is also evident at the individual level, whereby Anubav, participant at the Lekker Nussuh T-Lab notes that *"I now question myself even more. And I believe that anything is possible, which I didn't maybe a year ago when I thought that these are the guidelines set by society, this is what's possible."* At the level of the community, Carlos at the Aldeafeliz T-Lab notes that*"there are moments with a strong symbolic power that makes us ask who we are, and leads us to a deeper sentiment for the respect of diversity, which in the end we incorporate... we are diverse, and we are people in a process of auto-construction, finding out who we are. We are not taking a single teaching which is telling us who we are, we are not on one path that is telling us who we are, but assuming the exercise of finding out ourselves who we are."*

To summarise, this learning stage represents the fruition of a learning process, where participants have had the time to reflect on what he or she has experienced, putting it into context of their own learning journey. We can note the characteristic of 'before' and 'after,' signifying a transformation of some kind, whereby replicating such learning outcomes become possible.

4.6. Seeds

Seeds are the final units of replication that can be stored, planted in other contexts, or thrown into the air to see where they land and geminate transformation. At this learning stage, subjects mentions how what they have learnt during the T-Lab could contribute to replicating processes in their community context, for example, through reports, methods, results, new perceptions, skills and tools. The dominant theme that emerged in this learning stage was that of 'practices' and 'optimism.'

At a practical level, skills learnt during the T-Labs were replicated in other contexts. Participant Victor in the Aldeafeliz T-Lab describes how his neighbour who also participated in the T-Lab put into practice what she learned in the soap making exercise of the workshop. *"She is taking advantage of the resources from her neighbours, used vegetable oil, oil from citronella* [an aromatic plant] *so the soap is better for the body, and she sells the soap to the community. This had an impact because the soap is not commercial, and the neighboorhood is happy because it is a*

product from the area. My neighbor is also happy because she makes money from selling the soap."

In addition to valuing the practical replication of skills learnt during the T-Labs, a dominant value in this learning stage was 'optimism'. As Eber in the T-Lab in Las Islas del Rosario notes, *"It is not about giving workshops for the sake of giving workshops, but that the workshop generated positive results such as the commitment from the participants...The participants left with the expectation that all these exercises can help them expand and change towards affirmative actions in their territories."* This optimism is mirrored by CotM participant Stefen, *"...there is a common movement that is conscious of the necessity of a transition, to walk this path. But at the same time this is very lonely. If one is alone, in their project, occupied and fighting against all the obstacles, against all the resistance one receives, well this is also exhausting. To see that others are doing something similar, and this exchange of tools and solutions - ah, in this case I did it this way etc - this fills the toolbox with tools in oneself, this tool box of options, how to react, solution, support, create, this is very transformative."*

Last, the emancipatory aspect of learning to take responsibility for the transformations needed in society were represented by Anubav in the Lekker Nassuh T-Lab. *"I think one of the biggest learnings that everyone can take from here is that the power is really in the peoples' hands and we don't have to wait for anyone sitting in a bureaucratic position to make a change for us. The power to change is really in everyone's hand. I think with the combination of a lot of small changes there will inevitably be a big change. And that will have come from the ground up, instead of from top-down. And I believe that would be the most powerful and lasting change."*

In summary, at a 'practice' level, some subjects shared examples of skills learnt during the T-Labs that were replicated in other contexts. Yet a stronger value than the practical replication of skills was the value of 'optimism' expounded by subjects. This represented a strong emancipatory aspect of learning to take responsibility for the transformations needed in society, and a conviction that this was possible after participating in the T-Labs.

5. Discussion

As the quote from Anubav epitomises, at the end of the previous section, one of the most important aspects of education and learning is to motivate individuals to believe and act on the belief that they can transform themselves and the world around them. This involves the difficult task of bridging the difference between what we believe to be sustainable, and our everyday actions. This knowledge-action gap exists despite the ample scientific evidence pointing to the negative impacts of Man on the environment. That the status quo of unsustainability is still the norm highlights the limits of science, and our rational minds to change our behaviour towards more sustainable habits.

As Dahl et al. [107] argue, motivation and commitment to change are rooted at the deeper level of emotions and values. Building on research into values-based indicators in assessing Education for Sustainability [302], , the authors of this paper have developed a set of thematic values which characterise the learning stages and learning aspects of the Living Spiral model (see table 3 above). The results section above has provided representative quotes from the four respective T-Labs, derived from semi-structured interview data.

T-Learning colleague Stefan Bengtsson argues that there are no definite understanding of transgression, as transgression itself involves the undermining of rules and boundaries [61]. What we have tried to do, however, is empirically show how in specific contexts, there are situations and perceived experiences which provide value-based 'signs' of transgressive learning taking place. In this section, we will discuss the signs of transgressive learning taking place in practice.

5.1. Addressing uncertainty by taking a step back and reflecting.

The value that received the most coding references in the data was 'acknowledging uncertainty'. This value was characterized as disrupting the status quo of what is normally understood, and valuing the ability to accept and let go of what is beyond our control. Earlier research has demonstrated the importance of disruption in learning contexts through opening up possibilities for change within a system, through engaging in ontological politics [80]. This transgressive characteristic of a 'break with continuity' [61] is highlighted by participant Sebastiaan, in the Lekker Nussuh T-Lab who states that, *"we run into resistance, within ourselves or within the community... each moment that could be transgressive to me has something to do with blockage or resistance being solved in a way."*

Acknowledging the uncertainty resulting from barriers in learning processes promoted reflexivity in the participants. A strong example of transgressive learning taking place in the T-Labs was the case of Lekker Nassuh in the Netherlands, whereby various participants expressed the tension between resisting hierarchy in the organization of the initiative, and the increasing recognition of the need for structure so as to provide order and clear roles and responsibilities for activities. In a common sentiment shared by the other T-Labs, participants in Lekker Nassuh reached the difficult conclusion that they had to change the rhythm of their initiative; stop, take a step back, reflect, and reorganize themselves in relation to their initiative. Margarita in the T-Lab of Las Islas del Rosario described this process as inhaling and exhaling, while Andres in the CotM described this change in rhythm as the contraction of a spiral. Being able to value the need to step back, and not control everything in a process is a clear sign of transgressive learning taking place.

5.2. Community and relationality driving deeper questions of purpose and belonging.

A strong theme in the interviews was the importance of building relationships between people and territory in the T-Lab settings. A metaphor used in the CotM T-Lab was the metaphor of 'weaving' relations between participants and the territory, and these values were particularly evident in the learning stage of the roots, representing the context from where learning was taking place.

In the Aldeafeliz T-Lab, a fundamental tension was the search for belonging. This manifested itself in the tension between the desire to connect to one's ancestral place (practices and beliefs of people who previously lived in the territory) and the acknowledgement that participants had been brought up in a different modern world, and that there was a need to be true to oneself in deciding how to relate to the world around them. As co-researcher Tatiana Monroy states: *who are we?" Are we Indigenous? Are we urbanites that want to learn from the Indigenous world? or are we a blend?* This encounter with different ways of relating in the world also came out strongly in the CotM, represented by how participant Yuluka described

relating to the territory through embodying the climatic aspects of mud and rain, and how these difficult experiences taught her to question new things about herself. This relationality was similarly expressed by participant Edgardo in Las Islas del Rosario. *"One has to have a sense of belonging. If I am not aware of things, recognizing myself, then what am I doing?*

With the appearance of these values of community and relationality, a transgressive sign of deep reflection was evident in participants. This involved going beyond simply a connection to a territory, but a questioning of who one really is, and one's purpose in life.

5.3. Unveiling 'absences' through transgressive learning

While in fields such as collaborative learning there is a bias towards questions of how to work together with actors present, a fundamental aspect of transgressive learning is making visible what is absent in transformative research so as to better capture the challenges of overcoming sustainability challenges. Although this aspect is not unique to transgressive learning, being present in fields such as social learning [111], its focus on identifying and addressing subverted forms of knowledge relationships makes absence a vital concept in transgressive learning. At a superficial level, absence was reflected in the results from the different case studies. In the T-Lab in Las Islas del Rosario, there is the appreciation by participants of the importance of bringing new knowledge and skills in the workshop, which were absent before. In the T-Lab in Aldeafeliz, it is noted how the T-Lab made visible actors in the region, and like in Las Islas del Rosario, the experiential activities brought these actors together in a community process.

However, there are notably few references to people, ideas, or perspectives excluded in the T-Labs. In other words, a critical view by participants was perhaps lacking as to the possibilities of power relations being replicated through transformative processes. It is of course easier to notice and talk about what we know and see, rather than what is absent and invisible in our lives. However, this lack of a critical perspective by participants can be seen as an area to improve on in future research using critical event inquiry. As an 'inquiry of discomfort' [72], whereby a more emancipatory approach to narrative research is taken, there is an invitation for the researcher to delve deeper into the assumptions of the research subjects, and ask follow up questions which ask more explicitly about absence in the experiences of the subjects. As interviews were conducted *in situ*, at the end of each T-Lab, a reflection is that the focus was more on the empathic connection with interviewees, trying to *understand* the experiences they had gone through, rather than a more disruptive interviewing technique which wanted to *question* what the participants had experienced. In line with the characteristics of transgressive learning (table 1 above), the balance between the researcher being disruptive and empathic needs careful attention and reflection.

5.4. Key conclusions and further research

Rather than understanding education in SDG 4 as a linear process towards predefined goals, such as in the United Nations SDG 4, the Living Spiral model addresses the 'messy' nature of social science research [202] through conceptualizing learning as being composed of uncertain and emergent forms, much like the conceptualization of 'wicked' sustainability challenges [62]. For this reason, alongside research by Brockwell [302], we have placed focus on the *process* of developing values which characterise the contexts we are studying, rather

than using externally developed indicators to measure transformations taking place.

Through the empirical data analyzed in this paper, the values of 'acknowledging uncertainty', 'relationality', and 'community' provided signs of transgression taking place in the four T-Labs. The enactment of these values led to the motivation of T-Lab participants to reflect deeply on their sense of belonging, and sense of order through seeking connections between different ways of learning, being and doing in life, in one of the transgressive learning characteristics of ecologies of knowledge [63] (see table I).

However, inherent to such ecologies of knowledge is the need for epistemological justice [63], whereby a strong characteristic of transgressive learning is the role of dissonance to disrupt fixed values and beliefs, and provide opportunities for new worldviews to emerge and enter into dialogue. This disruptive characteristic of transgression needs to be balanced with an ethics of care and a culture of reflection [12] (see table I). As Ojala [241] states, hope can be inspired by disrupting unsustainable norms, but such learning can also trigger anxiety at the gravity of climate change problems and the undecided nature of the future.

In conclusion, a key message for educational practitioners and academics who want to support processes of transgressive learning in their own environments is to take into account the strong power dynamics inherent in multistakeholder learning environments. This means reflexivily balancing the disruptive and empathic characteristics of transgressive learning through acknowledging and addressing 'absence' in their learning environments. Addressing this, transgressive learning can help capture the dynamic processes of learning providing inspiration and guidance to future educational programs, with the Living Spiral model acting as a means to analyse data and monitor learning processes.

Appendix 1

In the Colombian Case study of the International T-Learning project we are employing critical event inquiry to explore moments and processes of transformative learning. This is a qualitative research approach to identify patterns of transformation that we are investigating, in the form of a story with the events that a person lived through a process (or its existence in other cases). The original questions asked in Spanish are in italics, with bracketed information specifically for the interviewer.

Research questions:

1.   "What have been three to five (3-5) events or experiences that have been most significant during the process of the T-Lab you have been part of?" *(Original in Spanish: ¿Cuáles han sido los tres a cinco (3-5) eventos o experiencias que han sido más significativas en el proceso del T-lab del que hace parte?)*

2.   "If we define transformative learning as a change in reference points, and world-visions, to what extent have these experiences been transformative to you and your community?" [to interviewer: If yes, why; if no, why not? What was the transformation and why did it happen?] *(Original in Spanish: Si definimos el aprendizaje transformativo como un cambio en los puntos de referencia y visiones del mundo, ¿Hasta qué punto han sido estos eventos transformativos para usted, para el grupo? ¿Por qué si o por qué no? (¿cuál fue la transformación? Y porque la transformación sucedió?).*

3.   [To interviewer: If the answers to questions 1 and 2 only reference personal changes, ask the following question] "Was there an event or experience that was transformative for the group or the collective?" (original in Spanish: Si las respuestas de la pregunta 1 y 2 hacen referencia solo a cambios personales/individuales hacer la pregunta: ¿Hay algún evento o experiencia que haya sido transformativa para el grupo como colectivo?

4.   How would you relate these experiences with the challenges of climate change (food sovereignty/security and water, water, social justice, energy) at the personal and community level? (Original in Spanish: ¿Cómo se relacionan estas experiencias con los retos de abordar el cambio climático (soberanía/seguridad alimentaria y de agua, justicia social, energía) en los niveles personal, en tu comunidad?

Summary

This thesis represents a transgressive journey into the quest for answers in the nexus between education, sustainability, and climate change. The point of departure is our shared planetary crossroads: In one direction we have the beaten path of the status quo, replete with, socio-ecological injustice, ephemeral prospects of technological salvation, and a highly probable end to the human race as we know it. Branching off to all other sides, however, are the more overgrown and uncertain paths representing alternative futures, some of which may lead to future prosperity for all. In a world seemingly spiraling out of control, the question of our time is whether we have the will and drive to step off the known but destructive path we are on, and break into unknown but possibly liberating terrain.

The contention of this thesis is that, yes, such a collective decision is possible, but depends on the need to 'transgress' - move beyond - structures, paradigms, and norms which maintain the status quo. This thesis argues that learning-based transformations are needed for such transgressions to take place, based on disruptive capacity building and action-based change across diverse sectors of society. The main research question is: *To what extent can transgressive learning, as a more radical form of learning-based change, lead towards more regenerative transformations?*

Addressing the need for more action-based narratives of grassroots resistance to climate change, this thesis is based on empirical research (2016-2018) in Colombia, as part of the international project called 'Transgressive Social Learning for Social-Ecological Sustainability in Times of Change' (acronym T-learning), funded by the International Science Council (ISC). Making up the Colombian case study of the T-Learning project, this research is an action research project involving various grassroots initiatives in Colombia, from which co-researchers from participating communities have actively participated in the investigation.

This thesis has four key findings. First, if we are looking to overcome deep, structural sustainability challenges, which are highly resilient and resistant to change, then forms of learning which engage multiple stakeholders in a critical, reflective, disruptive and regenerative way, are crucial. Second, engaging in such learning demands special researcher qualities of courage, empathy, and reflection, as well as the ability to take a step back from a process and to reevaluate one's purpose. Third, in terms of levers and barriers to transgressive learning, it is fundamental to be reflexively aware of what such learning may lead to, promoting a strong transformative process which can harness disruptions in a generative way through balancing disruptive and empathic elements. Fourth, transgressive learning requires careful design to insure there is a diversity of actors and perspectives present, as well as a facilitator with a toolbox of methods to insure the space is a safe and reflexive environment, which promotes collaboration and meaningful empathic communication between participants.

These findings are represented in my thesis in two different, but complementary ways. The first nine chapters present my personal transformation narrative, where I share my learning

journey through the innovative Living Spiral model, which I have co-developed during my doctoral research (see the figure below). Delving into the emerging theory of transgressive learning, which binds this thesis together, I bring this theory to life alongside my co-researchers through moving through the learning stages of the Living Spiral model, represented in the figure below by the parts of the generic spiraling plant: Roots, Shoots, Stems, Leaves, Blossoms, and Seeds.
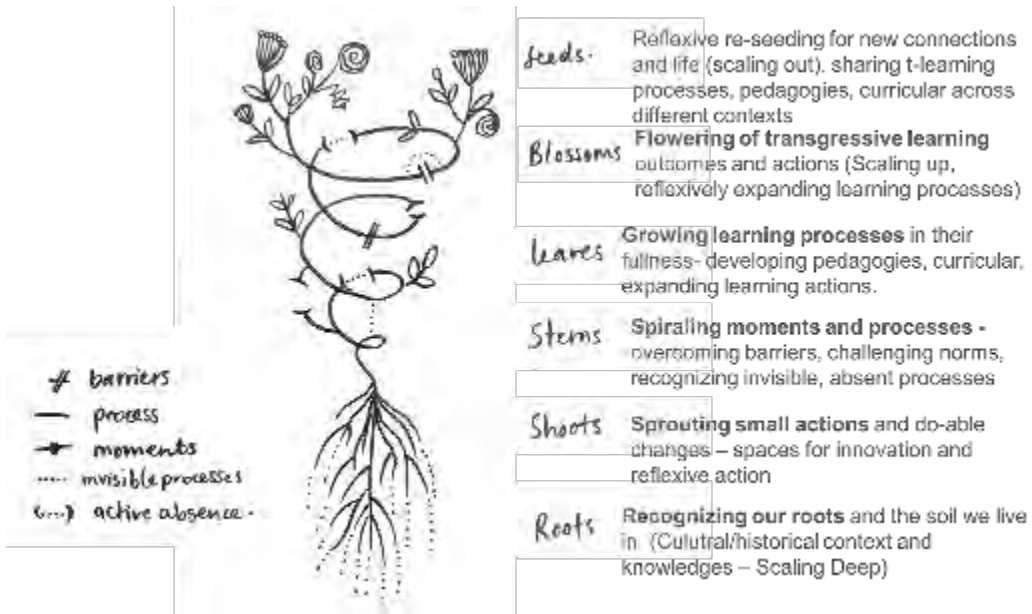
The six appendices in this thesis correspond to published and submitted peer-reviewed papers, which represent the same doctoral journey, but in a different 'scientific' language, with more focus on results, and less on the learning process. It is important to note that the main transformation narrative in chapters one to nine weaves in methods, results, and discussion points from the peer-reviewed papers in the appendix, so it is up to the reader to decide the extent to which and how he or she moves between the narrative and publications. The following are overviews of the chapters and appendices.

In the introductory chapter one, I begin by providing an overview of the research context, including the research questions which have guided this investigation. I explain how the metaphor of the 'transgressive gardener' came about, and how the rest of the thesis is an attempt to provide substance and inspiration to the fields of transgressive learning and action-based change.

Chapter two presents the theoretical framework centered around learning orientations in the context of addressing climate change based on Macintyre et al. [32], and the concept of 'transgressive learning', which is the center of gravity binding this thesis together. I also present the Living Spiral framework developed as part of this doctoral work [66], whereby the following chapters tell my research journey, weaving in my research results, discussions and conclusions into a worked example of my personal Living Spiral framework.

Chapter three begins the Living Spiral exercise by exploring the 'roots' of the Colombian case study of the T-Learning project, based on earlier research into an ecovillage called Atlantida in southern Colombia, and an intercultural event called the Call of the Mountain [79]. This

section provides the embedded context or worldview of the 'Transgressive Researcher,' upon which this research is based on. It draws heavily on Macintyre and Chaves [12], emphasising the performativity of research, and the key capacities of reflection, empathy, and courage needed for the transgressive researcher to address deep-seated, socio-ecological challenges.

Chapter four continues the Living Spiral exercise by exploring the 'shoots' which evolved from the original research context, in what we can understand as the methodology section. This focuses on setting up a research team involving co-researchers from community initiatives being studied in the Colombian case study in the framework of participatory action research. Vital to this process was defining the method of Transformation Labs (T-Labs), as a means to collect data from participating initiatives, and the method of dragon dreaming as the means to arrive at a collective vision for our research team, and the method of Sociocracy to provide concrete steps to enact this vision.

The forward momentum of the previous chapters comes to an abrupt end through the disruptive events taking place in chapter five. A cornerstone of the research - the intercultural event 'The Call of the Mountain' - is dramatically cancelled, leaving the Colombian T-Learning team hanging in the air. Understanding these events as the 'shoot' of the plant breaking off and dying, this chapter, based on an article in Communities Magazine [90], explores the nature of learning in terms of 'letting go' of a process, accepting nature to take its course, and the importance of letting a process die, so as to be reborn.

Chapter six sees the reinvigoration of the spiralling process through the development of T-Labs in the respective co-researcher communities, the tarot of transgression method, and the realization of Living Spiral narratives by co-researchers. These experiences and their reflection lead to the development of the defining methodology of this thesis: Transgressive Action Research, presented in Macintyre et al. [13] We can see these processes as shoots developing into stems, moving out of comfort zones, addressing barriers to socio-ecological change.

Chapter seven moves into the realm of expansive learning, where the shoots have developed leaves, and through collaborative learning, new alliances and ideas have developed. This chapter presents a collaborative writing process on transdisciplinary research in the context of the United Nations SDGs (appendix 5), an early-career research school called 'Living Aulas,' which the author co-organised, and empirical research findings on 'signs' of transgressive learning based on critical event narrative inquiry in the T-Labs of the study (appendix 6).

Chapter eight presents the climax of the Living Spiral process, where the budding plants have blossomed, addressing the question of what transgressive learning looks like in practice. This has taken the form of a multi-stakeholder course called *Turismo de Origen*, which seeks to bridge higher education and community-based learning, through a multi-actor hybrid course which took place in November 2018 in Colombia. This chapter specifically addresses how to design and facilitate transgressive learning, and the levers and barriers to realising meaningful learning outcomes (appendix 4).

Chapter nine concludes the research narrative, whereby I return to the four research questions reflecting on the reseeding of transgressive learning in other societal contexts, and the possibilities and challenges ahead. I finish with a personal insight on how this doctoral journey has transformed my understanding of my role in the world, and how I forsee future transgressive learning.

Having finished the narrative section of the story, the following six appendixes correspond to the scientific publications which accompany this thesis. Appendix one presents a paper published in the journal COSUST called: *Towards transformative social learning on the path to 1.5 degrees.* This paper provides insights into learning orientations and approaches that encourage change and transformation on the path to achieving the 1.5 degree C target. It argues that a wide range of learning orientations, including more inclusive and transformative social learning approaches, are needed to address the colossal challenges facing society.

Appendix two presents a paper published in the Canadian Journal of Environmental Education called: *Balancing the Warrior and Empathic Activist: The role of the Transgressive Researcher in Environmental Education.* This paper explores the complex relationship between environmental education and researcher activism from the perspective of transgressive learning. This paper argues that key capacities of reflection, empathy, and courage are imperative in order for the transgressive researcher to address deep-seated socio-ecological challenges.

Appendix three presents a paper published in the journal Action Research, called: *T-labs and climate change narratives: Co-researcher qualities in transgressive action—research.* This paper introduces a concept of Transgressive Action Research as a methodological innovation that enables the co-creation of counter hegemonic pathways towards sustainability. Through the method of the Living Spiral Framework, fieldwork reflexions from the Colombian case study of the international T-Learning project were elicited, uncovering and explicating the transgressive learning qualities needed to respond to climate change.

Appendix 4 presents a paper submitted to the journal Sustainability called: *Transgressing educational boundaries: Levers and barriers towards bridging community learning and higher education through the Koru educational approach.* This paper explores the levers and barriers for connecting community learning and higher education through the theory and practice of transgressive learning in the form of a multi-stakeholder course called *Turismo de Origin.* Results show that ICT, relations to place, and experiential learning acted as levers towards bridging forms of learning between participants, but that addressing underlying power structures between participants need more attention for educational boundaries to be genuinely transgressed.

Appendix 5 presents a book chapter submitted to the book *Transdisciplinary for sustainability - Connecting diverse practices* (accepted upon revision) called: Embracing transdisciplinary tensions on the road to 2030. This chapter explores the emerging field of transdisciplinary research from the perspective of the social sciences, with the goal of raising critical questions as to the forms of knowledge co-production needed towards meeting the 2030 agenda for sustainable development. We contribute to the TD debate through highlighting the importance of surfacing the inherent tensions and paradoxes of diverse perspectives, values and knowledge systems in society, contributing to TD as a more reflexive practice for sustainability.

Appendix 6 presents a paper submitted to the journal Sustainability called: *Signs of transgressive learning in the Living Spiral Model.* This empirical paper explores value-based 'signs' of transgression through employing the innovative Living Spiral model to track critical learning moments by facilitators and participants in multi-stakeholder Transformation Labs (T-Labs), which took place in 2017/2018 in various grassroot sustainability initiatives in Colombia and The Netherlands. Results demonstrate the importance of the values of 'addressing uncertainty', 'community', and 'relationality' in disrupting world-views through promoting reflexivity in participants and facilitators. It also shows the importance of further researching the power dynamics of 'absences' in transformative research so as to better capture the challenges of overcoming sustainability challenges.

About the Author

Thomas Macintyre has a masters degree in International Development Studies, with a specialization in Rural Anthropology. He is finishing a Ph.D. with the Education and Learning Sciences Group at the University of Wageningen, The Netherlands. His interests lie in the fields of rural development, transformative learning and narrative ethnography. A central question in his research is how radical learning-based transformations can break stubborn unsustainable norms, leading to more social and ecologically just futures.

Thomas lives on a farm in the coffee region of Colombia with his wife Martha, and son Mateo. His life project is to develop an agroecological farm which can contribute to regenerative ideas and practices within his local community and beyond. He enjoys planting banana trees and coffee bushes, and listening to the howling monkeys in the surrounding forest.

List of publications

Refereed journal publications

Macintyre, T., Monroy, T., Coral, D., Zethelius, M., Tassone, V., & Wals, A. E. (2019). T-labs and climate change narratives: Co-researcher qualities in transgressive action–research. *Action Research*, 17(1), 63-86.

Macintyre, T., Lotz-Sisitka, H., Wals, A., Vogel, C., & Tassone, V. (2018). Towards transformative social learning on the path to 1.5 degrees. *Current Opinion in Environmental Sustainability*, 31, 80-87.

Macintyre, T., & Chaves, M. (2017). Balancing the Warrior and the Empathic Activist: The Role of the Transgressive Researcher in Environmental Education. *Canadian Journal of Environmental Education*, 22, 80.

Lotz-Sisitka, H., Ali, M. B., Mphepo, G., Chaves, M., Macintyre, T., Pesanayi, T., ... & Joon, D. (2016). Co-designing research on transgressive learning in times of climate change. *Current Opinion in Environmental Sustainability, 20, 50-55.*

Manuscripts under review

Macintyre, T., Witjes, S., Vildåsen, S., & Ramos-Mejía, M. (Accepted upon revision) Embracing transdisciplinary tensions on the road to 2030. In W. Vermeulen & M. Keitsch (Eds.), *Transdisciplinary for sustainability - Connecting diverse practices*. Abingdon: Routledge.

Macintyre, T., Chaves, M., Monroy, T., Zethelius, M., Tassone, V. and Wals. A. (under review) Transgressing educational boundaries: Levers and barriers towards bridging community learning and higher education through the Koru educational approach. *Sustainability*

Macintyre, T., Tassone, V. and Wals. A. (under review) Signs of transgressive learning in the Living Spiral Model. *Sustainability.*

McGarry, D., Kulundu, I., Macintyre, T., and Kronlid, D. (under review). Ethical action to transgress hot messes: insights from the t-learning research network. *Sustainability.*

Magazine articles

Macintyre, T. (2018a). Answering the "Call of the Mountain" through a Spiralling Network of Sustainability. *Communities Magazine*, #180, 10–13.

Professional publications

Macintyre, T., Chaves, M., & McGarry, D. (2018). Marco Conceptual del Espiral Vivo / Living Spiral Framework (Version 1). Retrieved from Project T-Learning website: http://transgressivelearning.org/wp-content/uploads/2018/10/Living-Spiral-Framework.Marco-conceptual-del-espiral-vivo.pdf

Thomas Kloster-Jensen Macintyre
Wageningen School of Social Sciences (WASS)
Completed Training and Supervision Plan

Name of the learning activity	Department/Institute	Year	
A) Project related competences			
Writing research proposal	ELS	2016	6
T-Learning team-building workshop	Fundación Mentes en Transición	2017	2
T-Lab methodology workshop	Aldeafeliz Ecovillage	2017	2
International T-Learning workshop, Sweden	Rhodes University, SA	2017	2
'Towards 'Transgressive Learning' in Bioregional Transition Labs in Colombia.'	Los Andes University, Colombia	2017	1
'*El Aprendizaje Transgresivo en tiempos de Cambio Climático: conceptos, investigación, ética y criterios.*'	Universidad de Quindio, Colombia	2018	1
'*Alternativas al desarrollo, reivindicando la identidad local.*'	Grupo de Investigación en Noviolencia, Paz y Desarrollo Humano-DEPAZ, Colombia	2017	1
B) General research related competences			
WASS Introduction course	WASS	2019	1
Organizing research school	ISC	2018	3
Collaborative writing project	ISDRS	2019	1
Webinar series	Action Research Plus Foundation	2019	1
Living Spiral Methodology booklet on the Living Spiral Framework	Fundación Mentes en Transición	2018	4
Curriculum development course	Fundación Mentes en Transición	2018	4
C) Career related competences/personal development			
Permaculture design course	Fundación Viracocha	2017	4
Organizing and facilitating international action research conference	Action Research plus Foundation	2019	3
Supervision internships	Fundación Mentes en Transición	2017-2018	2
Non-academic publications resulting from PhD project (see publication list in thesis)	WU	2018-	1
Teaching course *Koru*	WU, Fundación Mentes en Transición	2018	2
Total			**41**

*One credit according to ECTS is on average equivalent to 28 hours of study load