Exploring the Role of Climate Emotion Tools in Climate Science Learning with Youth and Indigenous Climate Activists from Mexico

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Abstract

One of the biggest problems faced by activists, youth, Indigenous people and other people at the forefront of climate impacts and the climate movement is inaction by governments and the majority of the world's population. In response, there is a growing trend of introducing climate change education in different learning environments, from schools to universities to informal education in activism spaces, resulting in a wide range of climate-related emotions in learners. This study seeks to bridge the gap between research on climate education and climate emotions by exploring the possibilities and impacts of combining climate science education with peer-to-peer tools that aim to enhance climate science learning and support the emotional resilience of youth and Indigenous climate activists. Deeply influenced by community-based participatory action research, this qualitative study consisted of semi-structured interviews with seven volunteer participants following a six-class online climate science course that was developed in collaboration with 12 potential course participants from two activist networks. The emotions tools were integrated into the classes, and participants found that these tools greatly benefit their lives, learning processes, and mental health, suggesting the importance of embedding socio-emotional learning environments in both educational and activism contexts to foster community building and proactive engagement.

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Chapter 1: Introduction

Climate change is a natural process of the Earth. We live on a dynamic and alive planet, which means changes are to be expected. In the 4,567 million years of the Earth's history, our planet has gone through many climate changes that we can observe in the geological record, many of which have meant very radical changes to our planet and mark what we now call geological eras (Lutgens & Tarbuck, 2011; Ward & Brownlee, 2000). Despite the Earth's great age, humanity has only existed in a very small part of the Earth's history.

Since the first humans appeared, we have navigated many changes. Still, since colonisation processes and the Industrial Revolution started, we began to produce a change that, today, has altered many of the Earth's natural processes. Previously, changes on this scale only occurred with large-scale natural phenomena such as the Milankovitch Cycles that mark the periods in which the Earth rotates closer or further away from the sun and therefore influence the glacial and interglacial eras (Buis, 2020), meteorite impacts, and abrupt and prolonged sequences of volcanic eruptions. Now, the significant industrial processes and extensive activities that exploit not only the land but also its inhabitants are causing a significant impact on many of the natural cycles of the earth, such as the water, carbon, nitrogen and phosphorus cycles, ocean and atmospheric circulation, and other Earth systems and processes that are changing faster than expected (IPCC, 2022; Richardson et al., 2023; Spratt, 2023). These drastic changes come from systems that seek infinite economic growth through consumer-driven societies, even if that means not respecting the cycles and processes of nature and prioritizing profit over people, aggravating other social problems such as poverty (González-Gaudiano, 2010).

Despite growing understanding of the science of climate change and environmental degradation, there are still some barriers we are facing as humans to address this life-threatening

problem (IPCC, 2022). Many territories around the world have been modified on a massive scale due to past and ongoing colonisation processes in conjunction with the Industrial Revolution (González-Gaudiano, 2010). The powerful have sought to impose a single way of life, forcing the Land to be, or give, what is not intended, ignoring that our planet is diverse and, therefore, the forms of life are different. In very Western terms, science has been a tool that, throughout human history, has helped us to know and understand the world, but also to dominate it (González-Gaudiano, 2010; McGinty & Bang, 2016; Simpson, 2014). Currently, science gives us tools to understand, in depth, anthropogenic climate change and the systems and cycles that have been altered. To understand the world, it is necessary to know it well in all its processes, cycles, and interactions; this is where learning processes and education can play an important role. Formal education, however, is a gradual process that does not always have the expected results, much less support the urgent call to action necessary to address the problem.

Anthropogenic climate change has become a problem that: (i) is causing mass extinction of species and the disruption or interruption of the lives of millions of people on the planet, so it is already being called a climate crisis (UNEP, 2021); (ii) is rapid and becoming catastrophic such that climate-specific education is needed, which requires science education as a foundation and also a call to civic engagement and action (Bhattacharya et al., 2021; Frank, 2022); (iii) has been shown to have a substantial impact on people's emotions (Galway & Field, 2023), which is linked to how they respond to the emergency. Regarding the latter, there is a growing literature describing climate grief (e.g. Atkinson, 2022; Comtesse et al., 2021; Cunsolo et al., 2020; Cunsolo & Ellis, 2018; Holthaus, 2023; Klassen & Galway, 2023; Ojala et al., 2021; Pihkala, 2022; Schlegel, 2022) as well as coping mechanisms that societies have come up with to deny or overcome grief, such as Jensen's (2013) idea of "declining baselines" that makes it hard to notice

changes over generations, normalising the worsening situation and allowing us to overlook or forget everything that has been lost and will continue to be lost while we stay inactive. For these reasons, I believe we need an approach to climate change education that can allow for the processing of climate emotions. Doing so may better enable individuals to act on their own as well as work collectively on solutions, with diverse worldviews and approaches understood as a strength.

There already are many resources to teach climate science to all ages as well as different ways of facilitating environmental education and involving students in their learning. What I think is really needed now is we educators learning how to identify and work with our own emotions around climate change so that we can better listen to students' concerns (Chawla, 2020) and set aside the idea that there are “bad,” “inappropriate,” “good” or “appropriate” emotions (Ojala, 2021). There are already suggestions for how to manage the anxiety and other challenging emotions that the climate crisis evokes, but we must go beyond simply managing our emotions (Bell et al., 2022). We need to also focus on healing, taking advantage of all the learning and creation of ideas that we are capable of through collective knowledge-sharing. Having knowledge about nature does not immediately lead to having a positive attitude and, consequently, positive actions towards nature; what motivates real behavioural change is emotions (Kretz, 2012). Therefore, we need to weave our emotions into climate change education as we oppose the destruction of our world.

Authors such as Bhattacharya et al. (2021) mention how important it is to have students be a part of co-producing scientific climate knowledge, allowing them to use actual data and model different scenarios with that data. It can be devastating, however, for students to face the worst-case scenarios and realise how fast we are reaching them (Godden, 2021; Kemp, 2022;

Ojala, 2021). An alternative approach is to cultivate hope, which can look different for each person or community according to their culture and spiritual beliefs (Bell et al., 2022; Chawla, 2020; Ojala, 2012). Another approach is emotional modelling, where educators act as role models who help shift the focus of attention from individuals to systems, recognizing that there are significant systemic changes that need to happen that rely on strengthening relationships and reciprocity and putting the community at the centre (Bell et al., 2022). Many activists already do this to enlarge our capacity to act and be resilient to the changes that are yet to come (Hoggett & Randall, 2018), recognizing that there are other ways outside the colonial, academic, institutional paths to healing and to becoming a full, active member of our societies.

I know from my previous personal, professional and academic experience that there are many ways to improve people's learning on different topics and areas of knowledge. I also recognize there are a diversity of views about life on Earth, and that Western scientific knowledge is not the only valid knowledge system (Simpson, 2014). I am curious about how combining science learning and emotional tools impacts youth and Indigenous climate activists' learning processes and/or their lives and activism. I also wondered if peer-to-peer emotional tools can be useful for people who might struggle with learning science or whether these might help combat burnout in activists by allowing them to have safer spaces to take in the information, process experiences, and co-create ideas and solutions through critical and creative thinking. These questions are the basis of my thesis study. They are also grounded in my own experiences, so I now will share a bit about myself to personally situate my research.

Positionality

My name is Malinali, pronounced “ma-lee-ná-lee,” which means “fresh grass growing on a vine" in Nahuatl (one of the most-spoken Indigenous languages in the Mesoamerican region).

It is a name chosen by my parents as an attempt to re-connect themselves and me to our Indigenous origins in central Mexico, from which we know we descend. Due to the assimilation and colonisation processes in the region, it is difficult to know precisely to which Indigenous groups our ancestors belonged. I am what is usually called “mestiza,” thanks to all the genocidal attempts to erase the native peoples of what is now known as Mexico, through mixing with other races, mainly Spanish. We “mestizos” are a bit “of everything,” fulfilling the colonial aim of not allowing us to claim to belong to any identity fully. My parents saw the choice of my name as a form of resistance to ongoing colonisation.

I was born and raised in Mexico City, one of the biggest cities in the world, that still has remnants of forests here and there thanks to the work of organised Indigenous communities that remain alive and organising in the “monster city.” I was fortunate enough to grow up living a few blocks away from one of the remaining forests in the city’s surroundings. My father used to take me and my brother hiking every weekend, telling us stories of how he grew up in that forest with the river and all the changes he has seen the forest go through during his lifetime. I could see and hear the river from our house window, watch it grow with summer rain and get smaller as days went by during winter and spring. My mom always told me to use my five senses to feel the forest and all living and non-living beings in “him.” That is how my interest in and respect for the environment began.

My mother is an interior designer who became a family therapist after her divorce from my father. She realised I was always a deeply sensitive child who struggled with a lot of big feelings when all kinds of situations occurred and she did her best to provide me with emotional tools to overcome the harsh moments I went through growing up in a challenging world full of crises, especially as a girl in a “developing” country exploited by the rich nations to keep us

"underdeveloped" and in an ongoing colonisation process, where we experience or witness injustice from a very young age. Later on in my life, I realised that not many people have the same tools I had since I was a little child to manage my emotions and to take action to address all the things I perceived as unfair, heartbreaking or enraging, like climate change or armed conflicts.

Since I was very young, I dreamt of becoming a teacher, and my love for natural science and my concerns about climate change led me to start my post-secondary education with a BSc. in Earth Science with an Environmental Science track, which led me on the path of environmental education and climate activism, currently two of my biggest passions. I started as an environmental educator at a summer camp in 2014 and have been part of many environmental and climate projects in the city where I grew up and with other communities with which I am related.

In 2021, I decided to start a non-profit organisation with my climate activist friends from Mexico to make youth climate activism our way of living. For three years now, I have been organising an ongoing project named *Defenders of the Earth* with 20 other youth and Indigenous Land defenders and activists from different parts of Mexico; we advocate for our lands, our communities and our cultures as we look for solutions to the climate emergency in national and international events and forums such as the UN Climate and Biodiversity conferences. This project has allowed me to learn more about myself, activism for social and climate justice through slowness and tenderness, and community values, and to share some of my university science knowledge with everyone involved.

My passion for science was born from my love of knowing and trying to understand the world. My sensitivity has led me to love every being and every process that allows life to exist,

but also to feel much pain and sadness with every loss and to rage with every change or situation that costs the life or stability of thousands of people. In the last few years, I have been involved in more social justice processes, forging communities and support networks to sustain myself and the people around me. I also have learned about different decision-making processes, ways to lead, and ways to see life (thanks to the Indigenous knowledge friends and family have gifted me) and I have also gained more tools that have helped me and other peers in my communities to keep wanting to learn, connect, feel, heal and work for a future where a life with dignity is available to every being.

I have experienced and witnessed a wide range of deep emotions while participating in the climate movement, from pure, energetic joy when I am alongside my peers and, after hard work, we dance to celebrate when something went well, to heartbreak when we read the data related to climate disasters or hear the stories from people who have experienced it directly, and burning rage and powerlessness when we experience adultism, racism, classism, sexism or ableism in all kinds of "official" diplomatic events. Thanks to the communities that have embraced me and the tools I have been given throughout my life, I have overcome all the drowning emotions that multiple times have caused me to want to give up learning, working, fighting, and living. I know that both the scientific knowledge and the emotional tools I have acquired are seen as a privilege instead of fundamental rights. There are many reasons for this, including the difficulties educators face in teaching multiple subjects, the many social inequities that prevent people from accessing quality education, safe learning spaces, mental health support, and safe spaces to share emotions or simply develop their true selves, and the stigma around prioritizing mental health.

The idea for this study arose from a combination of several elements. I have felt what professionals now call “eco-anxiety” (Klassen & Galway, 2023) since adolescence and it only got worse throughout my studies in environmental sciences at university. It was in that last period that my psychotherapist, a few months after discharging me, suggested that I learn about active listening supported by the Re-evaluation and Co-listening (RC) community in Mexico. It was thanks to the listening tools and the co-listening community that my eco-anxiety became more manageable, so I decided to get involved with *Sustaining All Life*, the branch of RC focused on sharing listening tools for activists and organisers around the climate crisis.

Thanks to the climate activism spaces I was involved in through the school and through *Sustaining All Life*, I met many activists who were interested in what I was doing, both climate education and the listening circles and other emotional tools I had gained. As I formed networks and organisations that I still belong to today, my peers began to show more and more interest in me teaching them about climate science, facilitating listening circles, and teaching them more listening tools. Each time I taught I received many comments about how useful the emotional tools and listening circles were in their lives, in their activism, and in their learning processes. From this, I had the idea to combine teaching on both climate science and emotional tools, to help create safer spaces for climate activists to learn, feel, heal and think together to end this climate emergency that perpetuates oppression. I also wanted to better understand what I was observing and hearing anecdotally about this work and hoped that research focused on this would be useful not only to me but to others.

Research Question

My thesis research explores how combining science learning and peer-to-peer emotional tools impacts youth and Indigenous climate activists’ learning process, their lives, and their

activism and explores if, and how, peer-to-peer emotional tools can be catalysts for learning for people who have science learning difficulties as well as help combat burnout in activists. My overarching research question is: *How does including emotional tools during climate science learning impact climate activist course participants?* There are four sub-questions:

1. How do peer-to-peer emotional tools impact activists' lives and contexts?
2. How do peer-to-peer emotional tools impact how activists perform their activism?
3. Can peer-to-peer emotional tools impact climate science learning or learning in general?
4. Can peer-to-peer emotional tools help combat burnout in climate activists?

Chapter 2: Literature Review

The initial literature review began in June, 2022 and concluded in February 2023. Databases such as Google Scholar and Lakehead University's search engine "OMNI" were searched using key terms: "climate education," "climate emotions," "climate activism," "climate education and activism*," "climate education and Indigenous*," and "climate education and socio-emotional learning." However, I did not engage in a scoping or systematic review. After making progress in data collection and analysis, I conducted a complementary literature search in OMNI, Google Scholar and Google to find more references to further support the findings, from which some non-peer-reviewed references were obtained.

Background

As the years pass, the importance of climate literacy in all life stages becomes more evident in our changing world. One aspect that has recently started to catch the attention of climate scientists, activists, teachers, and health professionals is the deep connection between learning climate science and climate-related facts and feelings of despair, hopelessness, powerlessness, apathy, or even denial (Chawla, 2020; Cunsolo & Ellis, 2018). Around the world, some people who identify themselves as climate activists, primarily Indigenous and young people, have been gathering and demanding that decision-makers, industries, governments, and individuals tackle the climate crisis (de Moor, 2018; Fine et al., 2023; Grosse & Mark, 2020). That movement has grown, but we also see that some who are part of the climate struggle have little climate science knowledge and even misunderstandings of the processes involved in global climate change and some climate activists who are being burnt out (Hoggett & Randall, 2018).

Some professions have a tremendous emotional toll, such as emergency services workers, social workers and medicine-related professions like nursing. So too does climate-focused work,

although that may not be recognized by the public given climate activism may be considered a lifestyle rather than a job. As noted, there can be emotional impacts on people who decide to engage (Hoggett & Randall, 2018). Similarly, in school, there are topics or subjects that some students find more challenging to learn than others, and that too may entail emotional challenges. Learning climate and environmental sciences may cause emotional challenges that, depending on the personal and community tools we possess, will result in an emotional response, or lack thereof, to the information received.

Not all people who engage in climate activism have accurate scientific knowledge about the issue, and I have observed how that can affect the effectiveness of activists at international climate conferences. To help me better understand what I have been observing and to lay a foundation for my study, this literature review connects research done around three main topics—climate change education, climate emotions, and climate activism—to open the door for research where all three topics are considered together. A brief overview of existing information on climate emotion tools is also included.

Climate Change Education

Environmental education has been present in various formal and informal education settings for many decades now, with one approach focused on sharing scientific data and ecological information. With increasing evidence of global climate change, accelerated after the Industrial Revolution, the need to educate about climate science and enhance climate literacy has become very clear over time. Climate change education encompasses the learning, skills and values necessary to understand and address the impacts of the climate crisis including how the climate works on our planet, including its cycles and processes and the factors that shape and modify it (UNESCO, n.d). Climate education should also nurture critical thinking to avoid

oversimplification of concepts to allow learners to understand the anthropogenic influence on the Earth's climate (Bhattacharya et al., 2021).

It is also important to recognize that some societal structures, institutions, and systems, including schooling and Western science, continue to perpetuate ideas that are root causes of this climate crisis. As McGinty and Bang (2016) describe:

> Many efforts on climate change education presume this as well; they presume that learning the knowledge of climate science that has emerged from nation-states, the same nation-states whose ways of life have created the problems causing climate change, is necessary. These issues of climate change knowledge become even more complicated when we consider how the effects of climate change are manifesting locally in ways that force shifts in Indigenous ways of living. (p. 472)

Historically, science has been linked to rationality and objectivity in the Western world (Hoggett & Randall, 2018). Supposedly, there is no room for emotions if we want to be rational, but creating this false dualism between rationality and emotion is simplistic and distorts how we acquire knowledge and co-produce ideas (Jones & Davison, 2021). Despite it being false, this dualism has influenced the way science is taught and how climate change is often communicated, where there is a strong tendency to teach scientific facts about this worldwide physical, geochemical, and biological phenomenon as a matter of pure knowledge instead of as a matter of concern or as a matter people could put their hands, hearts, and minds together to address (Jones & Davison, 2021; Kretz, 2012).

Everyone acquires knowledge in various ways, and motivation for learning comes from seeing something as helpful to your life, place and time. It also can be heightened from what or whom you learn (Simpson, 2014). We are capable of seeing the world with a sense of wonder

and excitement, especially when we are younger, meaning that every person is a natural scientist ready to discover the world and be amazed by it, which can motivate learning if that sense of wonder and excitement is cultivated (Aung Than & Carson, 2015). The beauty of our natural scientific thinking can be overshadowed by the systems that claim we are solely rational beings, including educational systems that seek to bend alternative ideas to maintain the status quo, accommodating every new challenge in a way that ensures everything stays the same (Crex Crex Collective, 2018).

We are sentient beings capable of learning, and we are currently experiencing a planetary crisis like never before. From my experiences as an educator, climate activist and inhabitant of this world, I have seen that people face climate change with various levels of knowledge and emotional readiness. I have observed that lack of knowledge or emotional readiness may lead them to feel uncertain, numb or disempowered. Given the complexity of this worldwide crisis, it is no surprise that science educators and scientists have faced challenges in teaching students and communicating to the public about climate change, biodiversity loss, environmental degradation, the greenhouse effect, and related processes. Some climate change educators have suggested that it is important to use interdisciplinary approaches (González-Gaudiano, 2010; Verlie, 2021) and to teach beyond classroom walls (Louv, 2012; Simpson, 2014). Others, such as Chawla (2020), have suggested that promoting critical thinking to create spaces for civic learning is important for opening up the possibility of fostering skilful civic action that combines information gathering with learning how to make a difference as well as creating spaces for students to talk about how they think and feel while also requiring that they attend to the perspectives of others.

Such interdisciplinary, critical, and community-minded approaches to climate change education can be challenging since, as Bigelow (2014) wrote, the mainstream school system has

a hidden curriculum that focuses on the individual rather than systems, so it fails to alert us about our interconnections, teaching us to think about ourselves and our families but not about the Earth or about cultural patterns that might be more ecologically responsible. This ensures that most people do not develop an ecological consciousness and, if they do, only individual solutions are considered and systemic responses are harder to fathom. Though mainstream schools may not be good at it, authors such as Bhattacharya et al. (2021) suggest that, depending on the educational level of the students, teaching methods that contribute to the understanding of the complexity of climate change nonetheless can be used. They advocate focusing on scientific fundamentals and the use of tools that involve interaction with data, such as the use of models to promote understanding of anthropogenic influences on the Earth's climate by analysing various forms of scientific evidence. That said, I suggest that while it is important to know the basic concepts of climate change, it is also necessary to broaden our approaches. Notably, young people are interested in having a variety of holistic and innovative environmental and climate-focused programs and activities in their schools, such as making climate change courses mandatory or integrating climate-focused project-based and design-thinking learning processes into classroom instruction (Chawla, 2020; Frank, 2022; Jones & Davison, 2021). There is a global trend to integrate climate education in formal education, but it is currently insufficient (Field, 2019; UNESCO, 2019, 2022).

Climate Emotions

On top of the current climate threat, many places are also facing a mental health crisis for a variety of reasons; in some, this is due to intergenerational trauma and a lack of resources and spaces to heal emotionally, physically, and spiritually (Bell et al., 2022; Cunsolo & Ellis, 2018). Furthermore, there is much evidence that the abrupt changes to our land and atmosphere have

had an emotional impact on communities, thereby worsening the "bloom" of mental health issues everywhere (Galway & Field, 2023; Hickman, 2022; Klassen & Galway, 2023). Everyone is affected by climate change, from people on the climate frontlines to racialized people bearing the most obvious burden to White, middle-class people in privileged nations who are living in denial to avoid feelings like despair, powerlessness, and guilt (Norgaard, 2011).

There is no consensus on the definition of "climate anxiety" in the literature. It can be understood as heightened distress related to the climate crisis that is characterized by a constellation of strong and interconnected emotions such as worry, fear, sadness, anger, and powerlessness (Ray, 2020) and is one of the impacts of climate change on people's wellbeing (Clayton et al., 2023). Many authors now identify common emotions felt by climate activists as well as those learning about climate science, hearing climate change-related news or facing the effects of climate change: anger, fear, anxiety (including climate anxiety), powerlessness, sadness, and hopelessness (Bell et al., 2022; Galway & Field, 2023; Hickman et al., 2021; Ojala, 2021; Pihkala, 2022; Poma, 2018). In the collective understanding, these are usually labelled as "bad" emotions, which not only constructs a dualism of good and bad emotions (which can differ by gender roles and what is allowed to be felt by some and not others), but also encourages people to avoid these "bad" emotions at all costs, which can impact their wellbeing (Ojala, 2021). Authors such as Galway and Field (2023) suggest that we instead should refer to these emotions as "complex" to avoid the good/bad dualism.

Emotions are a natural part of who we are as human beings and are, in large part, what drives us to do or not do things. As much as we have tried to rationalise our decisions, research is increasingly showing the role of emotions, even when we try to remain "numb" to them (Hübl, 2021; Poma & Gravante, 2017; Verlie, 2021). Accordingly, as Galway and Field (2023) note,

"there is emerging evidence indicating that emotions can motivate and promote climate action and that engaging in climate action, collective action in particular, can help people cope with challenging emotions and climate anxiety" (p. 6). That said, we also can encounter people with "eco-paralysis," where they care too much about climate change but feel unable to do anything effective, so they engage in avoidance as a psychological defence (Albrecht, 2011). It is also becoming evident that we need to go beyond individualistic coping strategies or therapy to soothe our climate emotions, and instead need to come up with strategies for healing in ways that we can use those emotions in action (Hübl, 2021; Verlie et al., 2021). Gravante and Poma (2016) noted how important emotional work can be in political and organising activities, "since it allows groups to counteract fear, channel anger, transform exhausting emotions into joy, and attempt not to be overcome by despair" (p. 657). They also suggest that emotions such as gratitude and loyalty, respect and trust, and love can help sustain the people who are taking action.

Ojala (2021) studied sixteen Swedish high school teachers' beliefs about the role of emotions in climate change education and how they act when their students express emotions about climate change. She found they had four different responses: a) emotions are irrational and they have no place in the classroom; b) "negative" emotions are dangerous and should be avoided or replaced with "positive" ones; c) some "negative" emotions (anger and fear) are constructive while others are not; and d) emotions are complex and beneficial depending on the circumstances. In the fourth theme, two key subthemes emerged, one emphasising regulation of emotions and the other advocating for the utilisation of emotions to stimulate critical thinking. Ojala notes that psychological research underscores the significance of acknowledging "negative" emotions and validating them, rather than evading or dismissing them outright. To foster psychological wellbeing and social engagement among youth, she advocates that educators

facilitate discussions around climate-related distress, providing coping strategies and safe spaces for expression.

I found it interesting that many of the educators in Ojala's (2021) study said they specifically initiated verbal check-ins and tried to be approachable so that students would feel comfortable speaking with them when they clearly were not doing well emotionally. This suggests that emotions are usually only recognized or mentioned when there are evident signs of them, which does not take into account factors such as the "masking" that many people, especially neurodivergent people, tend to do when they are in social contexts (Kidwell et al., 2023; Ojala, 2021; Syharat et al., 2023). Numerous studies indicate that teachers commonly express uncertainty about how to address climate-related emotions and concern about their capability for handling their students' ecological concerns (Chawla, 2020; Ojala, 2012, 2021; Verlie et al., 2021). A focus on promoting "positive" emotions to advance the school curriculum and promote young people's wellbeing can be perceived as a political tool to undercut social criticism (Ecclestone & Hayes, 2008) Psychological research about emotion coaching and emotion regulation shows that it is also important to acknowledge and respect "negative" emotions and to learn from them and transform them into constructive action, which can promote conditions for both emotional wellbeing and active social engagement (Ojala, 2021).

It is imperative to break the silence surrounding climate-related emotional experiences by creating diverse safe spaces where people, especially youth, can openly discuss their feelings about climate change (Godden et al., 2021; Verlie et al., 2021). The rise of various support groups, networks, and group therapy options shows a growing effort to provide non-judgmental environments to acknowledge, express, and manage emotions regarding the climate crisis (Galway & Field, 2023). As Poma (2018) states:

> Sharing emotions with other people gets us closer to them and can strengthen collective identity. As well, it has been proven that humans can reflect on what they are feeling, or feel something, because of what they thought. This shows that cognition and emotions are always interconnected. (p. 196, translated by the author of this thesis)

Around the world, young people are advocating for mental health services within educational institutions, including access to counselling, student support groups, and instruction on coping mechanisms tailored to address climate change concerns (see Galway & Field, 2023, for supports Canadian youth are requesting of education systems). Despite this demand, there is limited research on practical interventions to address ecological distress in educational settings and beyond (Verlie et al., 2021). In addition, studies on educators and their philosophies on emotions are scarce, especially concerning education about larger societal problems, and there is a clear lack of research on the challenges and opportunities for schools to become safe spaces fostering coping skills and emotional resilience to climate change across various educational levels (Bell et al., 2022; Galway & Field, 2023; Jones & Davison, 2021; Klassen & Galway, 2023; Ojala, 2012; Poma, 2018; Verlie et al., 2021). Moreover, it is also relevant to remark that, although the literature on climate emotions and their connection with climate education is on the rise, much of this research tends to focus on students (e.g. Chawla, 2020; Frank, 2022; Hernandez Gonzalez, 2023; Jones & Davison, 2021; Verlie, 2021), with little attention to educators' own emotions and how that may influence their teaching.

These gaps in the literature need filling. I am moved by the words of Hickman (2022) who recognizes that emotions can play a very important role in creating knowledge, building relationships, and facing climate change:

> I don't want to get rid of people's eco-anxiety, at all. I don't want to get rid of mine. It's an emotionally healthy response, why would I want to get rid of it? It's the one thing that helps me connect emotionally and perfectly with my friends in Nigeria, with my colleagues in the Maldives. It is what can connect us, not separate us. (15:12-15:35)

There is a common belief among educators that they should not include disaster scenarios in their teaching and should try to teach in such a way that their students do not get discouraged (e.g., Chawla, 2020; Ojala, 2012). This is an approach, however, that reflects the perspectives of privileged people working in regions of the world where the crisis has not affected them yet. Many teachers around the world do not have the luxury of such avoidance given their students are already living with, and feeling, the impacts of climate disasters.

Emotions, Climate Activism and Climate Education

I have noticed in the activism spaces which I frequent and in the literature that, even with insufficient tools and spaces to recognize, name, express, transform, and heal emotions, populations vulnerable to climate change, most notably Indigenous peoples and youth, are nonetheless increasingly involved in actions to halt climate change. It is well known that Indigenous peoples have cared for and defended the Land and the climate for many generations and continue to do so (Amnesty International, n.d.; Ritchie, 2021; UNEP, 2020) and it is noteworthy that in recent years Indigenous peoples and youth have played a very important role in work to address climate change, which is especially evident in the strengthening of youth climate organisations starting in 2019 (Godden et al., 2021; Klassen & Galway, 2023; Martiskainen et al., 2020).

As these movements strengthen, more attention is being paid to the role emotions play within them, resulting in an increase in research from different disciplines, such as sociology and

psychology to understand the emotions felt by climate activists and how these emotions connect to their reasons and actions (Poma, 2023). Although a wide range of emotions have been identified in activists, when it comes to educating or communicating about the climate crisis fear has been used as a strategy for quite some time, but when 'climate fear' is fed by the catastrophic narrative on mass media around this topic, it becomes an uncomfortable emotion that instead of mobilising more people or motivating activists even more, it may lead to more denial (Norgaard, 2011), creating the opposite effect of what activists and educators would expect from sharing information about this daunting crisis.

Activism can be seen as a personal moment of rupture in someone's life, when the person decides to act after feeling that an idea, value, place, themselves or another living being is being endangered individually or collectively, in which case fear turns out as a mobilising emotion, as a result of circumstances out of the ordinary (Poma, 2023). The key to transforming climate emotions into tools to leverage collective action might be in the emotional work that educators, organisations and activists do to channel or evoke emotions (Poma & Gravante, 2021).

Poma and Gravante (2017) observed that people who give life to social activism tend to use emotions as a political tool to create, among other things, empathy for their demands and solidarity. Klassen and Galway's (2023) research illustrates how Canadian youth recognize that emotions can lead to necessary change; even if we want to ignore or rationalise climate change, loss and grief are something that has reached us, or will reach us sooner or later. The youth in Klassen's and Galway's study highlighted that orienting towards solutions, by seeking examples of others working to make positive change and by engaging directly in collective climate action themselves, helped them cope with challenging emotions. These findings resonate with Gravante and Poma's (2016) research with Mexican grassroots environmental activists. They wrote about

the importance of activists creating a collective identity to strengthen their connections with a community that shares the same ethics and struggles and facilitating spaces where sensitivities can be expressed safely to help prevent burnout and promote long-term sustainable climate action. Authors such as Norgaard (2011) and Poma and Gravante (2021) stress the importance of emotional management techniques to transition through and channel uncomfortable emotions instead of avoiding them, which leads to a socially organized denial of the crisis despite all the information that is available nowadays.

In the next section, I focus on tools that others have used to assist the sort of emotional work that Norgaard, Gravante and Poma advocate.

Climate Emotions Tools

As noted above, there is growing evidence of the effects of the climate crisis on emotions and mental health for students, the population at large, and climate activists. However, there is not very much evidence of the effects climate change education may have on climate emotions. Chawla (2020) compiled strategies used by educators at different levels to help their students deal with the climate emotions that arise in their classrooms, but observed that these primarily consist of "distracting" students' attention from emotions by focusing on actions, possibilities, and hope, without offering concrete tools aimed at noticing, naming, accompanying, transiting, or processing emotions (e.g., Jones & Davison, 2021; Verlie, 2021). As Ojala (2021) documents, some of the strategies used by educators focus on individualised ways of dealing with climate emotions, which connects with the critique made by Hickman et al. (2021): "Current narratives risk individualising the so-called problem of climate anxiety, with suggestions that the best response is for the individual to take action" (p. 871).

While action is necessary to combat the climate crisis, as noted by many authors cited

in this literature review (e.g., Bhattacharya et al., 2021; Hoggett & Randall, 2018), there is also literature suggesting why those who engage in climate activism are still a minority. It may be due in part to the emotional responses that many people have to climate change (Hogget & Randall, 2018); if they feel helpless and hopeless, it may be overwhelming to consider how to make change in a system that prioritises individuality and profit rather than communities and the wellbeing of living beings (Fisher, 2016; González-Gaudiano, 2010; Hamann & Reese, 2020; Hoggett & Randall, 2018). There is little evidence in the literature of tools that could help counteract this crisis of climate emotions. I thus decided it would be useful for my study to start with people who already recognize how climate change has affected their lives and mental health and who have decided to make it a central part of their lives. Understanding how climate activists have learned about climate science and climate emotions and how they sustain themselves in community could be helpful knowledge for others.

As I looked for examples of emotional tools in the literature, my search yielded only a few articles that made reference to the benefits of emotional or peer listening tools, such as listening circles that were used in corporate contexts in training employees (Itzchakov & Kluger, 2017a, 2017b; Janusik, 2023). However, I did not find anything that made direct mention of listening tools or listening circles in school or activist settings. I also looked for literature on emotional learning linked to climate education, which led me to an article in a non-peer-reviewed online journal by an educator, Lee (2023). In her discussion of her experience, she shares:

> I incorporated a number of social and emotional learning activities throughout my climate change lessons to help students grapple with and name climate anxieties. I was honest about my own climate anxieties and encouraged discussion so that students could

> take advantage of the existing classroom community to help combat the loneliness of eco-grief. (para. 4)

The lack in the peer-reviewed literature is consistent with my observation that emotional education has been delegated, for many years, primarily to early childhood education, and it has not been considered pertinent to include socio-emotional learning environments as an integral part of any educational space, formal or informal, for all ages. Perhaps, as Cranston (2022) suggests, that helps account for the rising rates of school desertion in different parts of the world, and why people tend to have few tools to regulate their emotions and face the situations that life presents day by day, without falling into a fight, flight or freeze response.

One strategy that could be used in emotional education is listening circles, which are a structured process to bring people together to better understand one another, build and strengthen connections, and solve social problems (e.g., in the community and the workplace); a key element is the willingness of participants to shift from a formal, opinionated discussion to a thoughtful, respectful process of listening with undivided attention, which sends whoever is speaking a signal that they are important and worthy of attention (Itzchakov & Kluger, 2017b). In a corporate setting, listening circles are said to support personal growth and improve the effectiveness of workers and internal dynamics between managers and employees, but it is still something relatively new and not yet given priority in most companies (Itzchakov & Kluger, 2017a,b; Janusik, 2023). I found no peer-reviewed articles or any type of research report on listening circles being used in climate education or by climate activist organisations in their day-to-day activities.

High-quality listening is shown to mitigate radical attitudes, social anxiety, and defensiveness, thereby fostering increased awareness of differing perspectives. This practical

application extends to reducing prejudices, particularly within the realm of Diversity, Equity, and Inclusion (DEI) programs (Itzchakov & Kluger, 2017a,b; Janusik, 2023). These findings have relevance for various settings, including organisations, schools, and families that want to cultivate effective listening habits for improved interpersonal dynamics and overall well-being. The existence of listening circles in the workplace has been shown to decrease job burnout and can result in more accurate transfer of information, less wasted time, and better use of organisational resources due to fewer misunderstandings (Janusik, 2023). If this type of tool or dynamics were taught from school age, as is intended with socio-emotional learning, it seems that many areas of the lives of adults could benefit. That is why I proposed that tools that are considered as basic as listening should be holistically integrated into teaching practices, especially in the teaching of topics that are known to have a great emotional impact, such as climate change.

In my search for emotional tools aimed specifically at educators, students and activists, as noted, I found nothing in the peer-reviewed literature. I did, however, find two online trainings, two tool-kits, and three listening circles or climate circles that are open to the public:

- A care and resilience tool-kit by *350.org* that consists of a series of YouTube lectures by climate psychology experts such as Caroline Hickman and Leslie Davenport, guided meditations and several digital resources to centre care and resilience as a climate activist or organiser. (350.org, n.d.)
- Climate Circles by *One Resilient Earth* that offers five climate circles per week online and the opportunity to register for training to host a climate circle. (Simon, 2023)

- Listening Circles by *Sustaining All Life* that offer a guide for listening circles, in both a YouTube video and a booklet, as well as over 20 written resources for understanding oppressions in the climate movement. (Sustaining All Life, 2019)
- The *All We Can Save Circles* by Dr. Katherine Wilkinson that consists of facilitation guides for 10 sessions. (Wilkinson, n.d.)

Prior to beginning this study, I participated in *One Resilient Earth*, *Sustaining All Life*, and *The All We Can Save Project* circles at least once. As a member of the nonprofit *Sustaining All Life* (SAL), since 2018 I have received ongoing training to lead listening circles. While I took into account some of experiences and some resources from the other trainings mentioned above, I mainly used what I had already developed for SAL's Listening Tools in the teaching part of this study, which I will describe in the next chapter.

Conclusion

Based on this literature review, I draw the conclusion that, even as the climate emotions and climate education research fields are growing but still small, there is sufficient research to assert that climate education is crucial at all stages of education as it equips individuals and communities with the necessary knowledge and understanding to address this daunting global challenge (UNESCO, n.d). Climate activists at the forefront of the struggle for climate justice are no exception when it comes to experiencing intense climate emotions, which can mean that confronting this constant emotional burden can affect their performance and mental health. However, despite the clear intersection between climate education, climate activism, and climate emotions, there remains a glaring lack of peer-reviewed research exploring the potential benefits of incorporating emotional tools into climate education.

This gap, which some have attempted to fill with social-emotional learning (Lee, 2023) and the other tools I mention above, is evident in all levels of formal education and even in the informal education of activist spaces. My study aims to bridge this gap by exploring how integrating climate emotions tools into teaching can impact learning outcomes and emotional resilience and by providing insights into more holistic and effective climate education strategies.

Chapter 3: Methodology

In this chapter, I describe the research approach, participants and the recruitment process. I briefly explain the course syllabus, how data were collected and analysed, how I enhanced trustworthiness and the possible conflict of interest. My research question was, again: *How does including emotional tools during climate science learning impact climate activist course participants?* The study consisted of seven interviews after a six-class climate change science course with integrated climate emotions tools for activists and Land defenders from Mexico.

Research Approach

This study used a qualitative research approach and is inspired by both the transformative paradigm (Creswell & Creswell, 2018) and community-based participatory action research (Burns et al., 2011). The transformative paradigm is based on the idea that research must address social issues, such as oppression and inequality (Creswell & Creswell, 2018; Mertens, 1999). Further, especially when working with people who are marginalized in one way or the other, collaboration between researcher and participants is recommended to prevent further marginalization, by giving them space to share their voices and by seeking to advance an agenda for positive change in their lives rather than prioritizing what the researcher might need personally or professionally (Creswell & Creswell, 2018; Mertens, 1999).

An example of a transformative approach is community-based participatory action research (CBPAR), which is a collaborative research framework grounded in the needs and particular issues of a specific community (Brown & Strega, 2015; Burns et al., 2011). Taking this approach fundamentally changes the roles of the researcher-researched binary that is sometimes set up in traditional research approaches through direct engagement of communities and building on their knowledge in the research process to support and enhance action for

community transformation and social change (Brown & Strega, 2015; Burns et al., 2011). CBPAR is especially useful with groups that have undergone knowledge extractivism and tokenism, emphasising that the complex social issues that the communities face cannot be well understood or resolved by "expert" researchers from outside the community (Brown & Strega, 2015; Burns et al., 2011).

Given the CBPAR framework, in this thesis I wanted to acknowledge that research can be an opportunity to renew relationships (Mulrenan, 2016). I wanted to change the ways research is usually conducted to ensure I did not reproduce the oppressions that young and Indigenous activist communities, of which I am a part, continue to experience. While I did not conduct a study fully in line with the CBPAR framework given the time limitations associated with an MEd thesis, it did influence aspects of how I structured and conducted the study. The initial research question came from me as the researcher, and I then shared this idea with potential participants who agreed with the question, focus, and approach. They made suggestions that I incorporated into the study, such as what science and emotional tools sessions I would include so that the teaching portion on which the research was based would meet their needs. None of the participants expressed interest in being part of the data analysis process, which I respected.

Methods

There were two steps in this research: a course and interviews. First, I taught a six-class, non-graded, non-credit course focused on climate science and climate emotions tools that I delivered via Zoom for 16 people who had previously worked with me and who self-identify as youth and/or Indigenous climate activists or Land defenders from different parts of Mexico. After the course concluded, I conducted semi-structured interviews with seven of these participants.

The course syllabus was developed in collaboration with 12 potential course participants from the two networks I am part of, REACCIONA[1] and Futuros Indigenas[2], as part of the capacity-building activities for the non-profits to which we belong. Preliminary talks about the syllabus and course logistics took place in May 2023. I took notes to keep track of climate science topics of interest, self-identified emotions they wanted to address or learn how to cope with, and individual and collective goals for undertaking this non-graded, non-credit course. The emotional tools that were included in the classes addressed the primary emotions potential participants identified as recurring in themselves when learning about science or climate data, or when engaged in activism. The schedule, topics, and emotional tools for the classes can be seen in Table 1. Classes were typically 150 minutes long each.

Table 1

Class Schedule, Topics and Emotional Tools

Class	Climate Science Topics	Emotional Tools
1 - June 14th	● Why geology matters in climate education ○ Rocks and fossils as tools to understand the past and present ● Earth history: ○ Ages ○ Extinctions ○ Climate changes throughout Earth's history	● The importance of emotional release ● Basics of SAL Listening Circles: ○ New and goods ○ Guidelines for a listening exchange or listening circle among peers ○ Preferential order according to identities as an equity mechanism

[1] Mexican network for climate action, made up mostly of women and gender-diverse individuals between 20 and 30 years of age.

[2] *Indigenous Futures* network is comprised largely of women and gender-diverse members.

		○ Explanation of prompt questions for listening exchanges ● Practise a listening circle - Is there something worrying you or distracting you right now?
2 - June 21st	● Milankovitch cycle ● Oceanic and atmospheric circulation and its connection to nutrient and contaminant transport	● Recapitulating the guidelines for listening exchanges ● Prompts for the first exchange: What's been hard in your life lately? How is it for you to learn science? What was it like to go to school or learn for you when you were younger?
3 - June 28th	● Climate basics: climate determining factors, weather, albedo ● Types of ecosystem and types of climates in the world ● Differences between pollution, GHG, Greenhouse Effect, global warming, climate change and climate crisis/emergency.	● How we can use listening exchanges or circles to address different emotions? ● Prompts for first exchange: What is in your mind right now? Is there something preventing you from being fully present in this class? ● Prompts for second exchange: What comes to your mind when you think about a crisis or emergency? ● Closing circle with self-appreciations
4 - July 5th	● Types of greenhouse gases, their heat retaining capacity and the time they stay in the atmosphere ● Highlight differences between the greenhouse effect and pollution ● Review the differences between climate, weather and ecosystems.	● The listening circle as a tool to make space for recurring emotions: ○ Prompt: Has any of the climate news you've heard recently or any of the topics we've covered so far in class made you feel sad, frustrated, hopeless, angry, or heartbroken? ● Taking turns to simply acknowledge and feel our emotions through sounds or movement, no words needed.

* July 19th	No climate science	● A listening circle took place instead of the planned fifth class
5 - July 26th	● Biogeochemical cycles: water, carbon, hydrogen, oxygen, nitrogen, phosphorus ● Carbon sinks ● "El Niño" and "La Niña" ocean and atmospheric events. Their differences and connections with climate change.	● Drawing our thoughts and emotions around the information seen in the first part of the class. ● Listening circle - Prompt: What comes to your mind when you think about these scientific terms?
6 - August 2nd	● Timeline of international environmental and climate change policies, conferences and agreements. ● Key elements of the Kyoto Protocol and the Paris Agreement ● What does 1.5 ºC mean and where did that number come from? ● What is the IPCC	● Listening exchange in pairs - Prompt: What comes to your mind when you think about laws and policies? ● Appreciations as a way to balance our attention ○ Appreciation to the course and the facilitator ○ Appreciation to the group ○ Self-appreciation ○ A place in nature that you appreciate

Although the class outlines were planned in advance to meet the expressed needs of the group, some modifications were made on the go following requests of the participants in real time, which aligns well with a CBPAR approach. For example, in the third class there were many questions and interest in learning more about the topics presented, all of which I then addressed in the fourth class. I also adapted my planned timing to give more time for the listening circles and exchanges based on the response the participants had to certain topics or their requests to prioritise the emotional release of their feelings. Also at the participants' request, the dates and times of the classes were modified, and an additional listening circle was

facilitated between classes four and five, following the students' request to postpone class five to prioritise space for emotional release.

A typical class began with a round of "new and goods," where each participant briefly shared a personal good thing, big or small, that happened to them recently. I taught climate science content for a maximum of 30 minutes at a time, followed by a listening circle or listening exchange in small groups of two to three people in breakout rooms. To decide the order of sharing in listening circles, we used *Sustaining All Life's* equity mechanism of giving preference to choose their turn to the people who hold less privilege in the space, which led to asking Indigenous women first, Indigenous men next, then working-class, brown and queer youth and middle-class and lighter skinned youth last, following their self-claimed identities. In the cases where they had similar identities, the younger person would choose their turn first. Also for equity, all members of the circle were given equal time to have the group's attention. Even when a participant chose not to speak, they could decide what to do during their time (e.g., stretching, yawning, laughing, sobbing, shaking, drawing, yelling).

Participants were given the basic guidelines for listening exchanges in the first class and briefly reminded of them in the second and third class. These guidelines are: listen with respect and full attention; refrain from interrupting, asking questions and giving advice; withhold judgement; welcome and make space for feelings if they come up; and, lastly, keep everything confidential. After listening exchanges, everyone would answer a silly or simple question (e.g., what colour are your socks? who would be an octopus' best friend? what is your favourite fruit? name your comfort food) to help bring their attention back to the present moment. These questions, which could be considered "icebreakers" in other spaces, along with the "new and goods" opening and appreciations at the end of every class, are referred to as "balance of

attention tools" (Sustaining All Life, 2019) meant to ensure that the focus is not always on difficult issues.

Participants and Recruitment

Course participants were people who openly expressed their concerns about the climate crisis and identified recurring emotions while learning about the topic or living with the impacts of climate change on their Land. All are people with whom I have previously worked and with whom I have developed personal relationships. Most had used peer-to-peer emotional tools on previous occasions, including with me as a listening circle facilitator. As noted, people had asked me to conduct a climate science course and to include some of the emotional tools I know. Ten of the 12 people with whom preliminary talks were held to plan the course actively participated in the course for at least one class. A total of 16 people participated in the course overall, 11 of whom attended at least half of the classes, and three who participated in all classes. These same three people had also participated in the preliminary talks.

Nine out of the 11 participants who attended at least half of the course expressed willingness to be interviewed, but due to multiple personal complications affecting two of them, only seven were able to take part in the study. I had stated my intention of doing this study in the preliminary talks when I was in the planning phase of the course, and I described the study to attendees during the classes, clarifying at all times that their participation in the course did not imply that they had to participate in the study and that participating or not participating in the study would not affect their relationship with me in any way. At the end of the course, the study was verbally described again to all participants, and I made space for course participants to ask me questions. Course participants who, at the end of the course, expressed interest in being part of the study received a formal invitation via email with the Information Letter and the consent

form in Spanish (see Appendices A and B) to read, reflect on, and ask questions about, before the interview was scheduled. No incentives were offered.

The nine prospective participants had the opportunity to ask questions about the research via email, one-on-one with me on Zoom, or using the commonly used apps in our shared workspaces, such as Telegram and Slack, before deciding whether to take part in the research. The scheduling of interviews was done based on the participants' availability and occurred between August 24 and September 15, 2023, with the understanding that interviews would last between 40 to 60 minutes.

Interviews were conducted with seven participants at the end of the course. The list of participants can be seen in Table 2. Again, participation in the research was not necessary for participation in the course and there was no "assessment" of course participants or any other mechanism whereby I, as the researcher and course leader, would have power over them.

Table 2

Participants, Preferred Names, Self-reported Gender and Pronouns

Name	Gender	Pronouns
Yoco Reyes	Man	He/him
María Tzuc	Woman	She/her
Erika Hernandez Mariaca	Woman	She/her
sacni acosta[3]	Non-binary	They/she
Ruby Bautista	Demigender (Demigirl)	She/they
Marina Flores	Woman	She/her
Paola Ruiz	Gender-questioning	She/they

[3] sacni acosta does not capitalize their name

Data Collection

Since I wanted to increase understanding of the complex and deep interconnections between learning and emotions, data were collected through one-on-one, semi-structured interviews that were audio-recorded using Zoom's recording function. The semi-structured interview guide can be found in Appendix C. Before the interviews took place, participants had two weeks to go through the information letter and consent form outlining the study's aims and purpose, its voluntary nature, and other details.

I began the interview and audio recording when I had obtained participants' signed consent forms. The Zoom interviews lasted between 39 and 58 minutes. All interviews were conducted in Spanish. Regarding confidentiality and safety, participants had the option to decline the audio recording and opt for note-taking; all were fine with recording. They also had the option of choosing to have their names or a pseudonym used. All interview participants chose to use their names, following which they were given the option to decide how precisely they wanted to be named in the research. Most opted to use only one first and one last name.

The interview transcripts were generated using Descript software due to its availability in Spanish. I reviewed these line by line while simultaneously listening to the audio to verify the accuracy of the transcript. During the transcription process repeated words were removed and colloquial expressions were substituted with terms that ensured the preservation of the original intended meaning while enhancing clarity for a non-Mexican audience. I also took comprehensive notes alongside the transcription process to help with later data analysis. Once the transcripts were saved as Word documents, and within two weeks of the interview, transcripts were sent individually to each participant via email, requesting notification of

reception within three days. I asked them to review the transcripts and make any necessary clarifications or request adjustments within a two-week window. None asked for any revisions.

Participants also had the right to withdraw from the study up to one month after receiving their interview transcript. In addition to this, they could choose to transition from having their real names disclosed to using a pseudonym instead, up until the completion of the thesis. None chose to withdraw or to change their names. The research was approved by Lakehead University's Research Ethics Board (Appendix D).

Data Analysis

After receiving the approval of the seven participants the transcripts were entered for coding into the qualitative analysis software "NVivo 14" (the free trial version). The coding was done inductively, line by line (Creswell & Creswell, 2018; Merriam & Tisdell, 2015), resulting in 25 codes. Subsequently, these codes were categorised into clusters using Microsoft Excel. Some codes originally appeared in more than one cluster, which I then assigned only to the most relevant for simplicity (see Table 3). After this process, four major themes (which share the same name as the original clusters) were identified that correspond to the research questions and one additional category called "other findings" that acted as a container for additional findings identified during the coding process that were not necessarily related to the research questions but could lead to new lines of inquiry. A complete code overview and the sorting of these, used for the final analysis and discussion, can be found in the codebook (Appendix E).

Table 3

Clusters and Final Codes

Cluster 1 - Impacts on their lives/context	Cluster 2 - Impacts on their learning process	Cluster 3 - Impacts on their activism	Cluster 4 - Mental health impact	Cluster 5 - Other findings

Applications of emotional tools in their context	Experience with the combination of climate science and emotional tools	Activism related experiences	Opinion of the emotional tools	Reflections on the course planning process and course feedback
*Contributions to community building	Previous science learning experiences	*Contributions to community building	Experience with the emotional tools in the course	*Contributions to community building
***Useful elements of the emotional tools	****Benefits for students	***Useful elements of the emotional tools	Previous knowledge or practice of emotional tools	Previous experiences with listening circles
**Sharing of climate science knowledge and concepts learned in the course.	Experience with the climate science course	**Sharing of climate science knowledge and concepts learned in the course.	****Benefits for students	Importance of knowing the other group members
	Previous climate science knowledge	Burnout experiences	***Useful elements of the emotional tools	Cultural context of emotions
	After-course knowledge of climate science	Addressing burnout	*****Management of emotional tools or safe spaces for emotions	*****Management of emotional tools or safe spaces for emotions
	**Sharing of climate science knowledge and concepts learned in the course.		Reconnecting with emotions	Importance of knowing the course educator
	Change in the perception of science			Non-useful elements for their con-text

The asterisks show which codes are in more than one cluster.

The planning process, course delivery, recruitment process and interviews were conducted entirely in Spanish. Since the data were in Spanish and the analysis software offered the option to be set up in this language, I conducted the analysis process in the original language of the interviews to preserve as much of the context and meaning as possible. The codes and

descriptions were translated into English once the entire thematic analysis was completed and the codebook was made. Only the codebook (Appendix E) and quotes from the interviews cited in the next chapter were translated into English.

Conflict of Interest

A potential perceived conflict of interest arises due to my previous professional and personal relationships with research participants. Given this study is rooted in community-based participatory action research, where pre-existing relationships play a crucial role in fostering trust and help ensure the researcher's commitment to the community and facilitate collaborative, equitable knowledge and resource sharing for the benefit of all (Burns et al., 2011), that is appropriate. Participants were aware that participating, or not, in this research would not convey advantages or disadvantages for them and that they could modify or withdraw their data, giving them control over the information. In addition, while discussing this research with the potential participants, I agreed that the results would be shared not only in my thesis but also at a public online meeting conducted in Spanish, to which the participants and others would be invited. Doing so helped show my commitment to Futuros Indigenas and REACCIONA and is true to CBPAR's values in seeking to advance anti-oppressive practice and working towards social justice as proposed by Holder (2015).

Trustworthiness

In my effort to instil confidence in me and the data I collected, I repeatedly invited participants to be completely honest in their answers throughout the entire interviewing process. Especially in the questions where I solicited feedback on the course or the emotional tools used, I emphasised that since this climate science course taught with emotional tools is a pilot project, any feedback or comments would be very useful for improving it and their comments would not

have any negative effect on me or our pre-existing relationship. Trustworthiness was also increased by the member-checking of interview transcripts (Creswell & Creswell, 2018).

Because this research was exploratory and the sample size was small, it is not expected that the findings are generalizable to all youth and Indigenous climate activists. Still, the findings provide insight into what including emotional tools during the teaching of climate science can look like.

Chapter 4: Findings and Discussion

My thesis explores the role that climate emotion tools can play in climate science learning. In this chapter, I share findings from interviewing seven youth and Indigenous climate activists and Land defenders from different parts of Mexico, portraying their perceptions, opinions, and experiences of the climate science course with integrated emotions tools. I have organized the chapter thematically, moving through each of the four themes in turn: 1) Impacts on their lives and contexts; 2) Impacts on their learning processes; 3) Impacts on their activism; 4) Impacts on their mental health. I have chosen to weave in relevant literature in this chapter to support the findings. I end the chapter summarizing other findings that, although they are not directly connected to the four main themes, offer important elements to consider for future research in this area.

Impacts on Their Lives and Contexts

In this first theme, I explore the how the participants' lives, personally, socially, professionally, or politically, have been or could be impacted by the emotional tools we used in the course. This theme responds to the first research sub-question: *How do peer-to-peer emotional tools impact activists' lives and contexts?* I organized these findings into two sub-themes: 1) Contributions to community building; and 2) Applications of the emotional tools.

Contributions to Community Building

This subtheme encompasses aspects related to the construction and strengthening of our own little community through the research process as well as the construction of a collective identity and strengthening of the communities to which the participants belong outside of the research group.

Within this subtheme, I document participants' perspectives on how the course planning and facilitation fostered a sense of community, acknowledging the principle of reciprocity and the importance of the role community-based research played in the entire process. All participants emphasised the collaborative and inclusive approach of the course design in their interviews, expressing appreciation for the efforts to create a supportive learning environment that encouraged active participation and mutual support in all stages.

To the question, "Is there any climate emotion tool or climate science concept that we saw that you don't think will be useful or is unlikely to be useful in your context," Maria responded:

> A lot of times they [researchers] approach communities wanting to teach certain things when they haven't even asked them if they need it, if they want it. So, your question is excellent, because you also asked us before teaching the classes, right? What we wanted to learn.

This collaborative approach not only facilitated knowledge sharing but also aided in the creation or strengthening of the bonds among course participants, creating a cohesive and engaged group. It also facilitated the group's internal processes while learning, since, as expressed by three of the participants, it favoured teamwork by fostering genuine connection between people, prioritising connections over productivity. For example, Ruby compared her previous knowledge of emotional tools by saying:

> The tools that I had were from a team building perspective, for people to sacrifice for the team, in a manner of speaking. And I feel that this one is really not so much for that, but it is for generating a genuine connection between the people who are collaborating. In

other words, it sparks other kinds of emotions. And it's not just focused on making a team connection, but a connection between people.

Additionally, six participants highlighted the principle of reciprocity as a fundamental aspect of the course, appreciating the emphasis on mutual exchange where both I in the educator role and they as learners benefited. When, at the end of the interview, I asked Yoco if he wanted to add any additional comments about the course that were not included in the questions I asked him, he said:

> I loved this new methodology. I have a good taste in my mouth from the learning and from participating. I feel privileged to learn in this way and that it was from a friend. It was like, modestly, I put part of my time, my efforts, my will and my heart. There are people like you who put their time, their will and their heart towards us. And that's what I take with me, that reciprocity. So, I feel very good to be able to give, but I also feel good to be able to receive. That is also something we have to learn: to receive, because we always want to give. I am very grateful for all that.

This reciprocal approach ensures that the knowledge and skills gained are applied not only for personal growth but also for the betterment of the interconnected communities, reinforcing a sense of responsibility and commitment to community welfare. When asked about their thoughts on the emotional, self-care and collective care tools that we engaged with during the course, all participants emphasised reciprocity and noted my willingness, as a facilitator, to share my feelings and experiences, which, even when there is a pre-existing close relationship, helps to reassure the intention of building a safe and non-hierarchical space. For example, sacni explained:

> It seems to me that this part of being equitable with time taught me a lot about collective care. And also not having a hierarchy when it comes to being in the listening circle. In other words, it was not in this sense like doing therapy or like you [the researcher] are the expert, because you are the person who is studying and you just give us the tools or the guidelines, but rather it is something very horizontal. I feel that this makes it more functional in the collective. Besides, time is also divided, understanding that people come from different contexts and when it comes to talking, we also talk in a very different way. There are people who are more used to talking a lot and we like to talk a lot; our time can end and we still have more things to say, but there are people who are a little more reserved. But it's great also that they know, "all this time is yours"; just as we all had all this time, you also have it and we are here to listen to you…I remember the first circle I was in with you [in 2022]. In the first session there were people who said very little and the rest of these time slots were used to stretch or yawn, to whine or grumble, and the rest of us were there, paying attention to them. That seemed important to me, that equitable and horizontal part of the listening time.

The participants' emphasizing the importance of building an equitable, non-hierarchal space is consistent with what has been found in the corporate literature regarding the importance of all people within the listening circles practising and removing barriers to listening to each other, including the "employer-employee" or, in this case, "facilitator-learner" hierarchies (Itzchakov & Kluger, 2017a,b; Janusik, 2023). In addition, it highlights the value in using CBPAR as a guiding principle for this research and the facilitation style of the classes, given that it fundamentally changes the traditional researcher-researched binary (and by extension, the educator-learner binary) (Brown & Strega, 2015; Burns et al., 2011).

Applications of the Emotional Tools

This sub-theme explores participants' perspectives on the utility of the course's emotional tools, including the specific components that participants found valuable, either because they had already found them useful or anticipated using them in the future in their personal lives. I also outline some of the key aspects participants preferred or considered effective in their learning processes or activism. One thing I found interesting is the diversity of ways participants thought the tools could be applied.

All seven participants consider learning to actively listen to one another as a critical tool and skill that, if developed and practised regularly, could have many uses, which is similar to what Itzchakov and Kluger (2017b) and Janusik (2023) stated regarding listening having to be frequently practised in order to make it a habit and benefit more from it. Yoco said:

> I believe that if we would take these practices of listening to many of our groups or our circles of friends and of collective work, perhaps we would progress more because before listening to the reasoning, we are listening to one's soul. And that is also very important... now I am practicing to be quiet a little bit and listen. With the purpose of making personal corrections, because sometimes by talking so much we end up saying something wrong.

Even though the main emotional tool recognized by the participants is peer-listening, the other tools such as the "balance of attention tools", the guidelines for listening and the equity mechanism stipulated by *Sustaining All Life* that accompanies the listening exchanges were also recognized as key for the listening to work and be applicable in their interpersonal relationships. sacni explained how she has used them within family relationships:

> It has helped me greatly on a personal level with my sister; although she is not very involved in the activist world, she is my sister and I tell her everything. Sometimes we also have our differences, our problems or we just want to tell each other things and, either to solve the problems or to tell each other things, I have used the listening tools. I have told her that we are going to set up these guidelines and we are going to listen to each other and it has worked very well.

In her workplace, Erika gives an example:

> With a colleague I have applied that same technique [of listening], but we don't see each other. Many times she sends me a message at night saying she is going to explode from anger because of something that happened and she didn't like it, and I just listen to her, then I remind her of something funny we did, and she kind of forgets the upset. I mean, she already told me that the person or the situation has got on her nerves. But then it's like we're done at night and we're going to go to bed and I tell her something funny. So I think it's like my best way, to transform a little bit, that tool that maybe I can't talk to her on the phone at that moment or go see her, but I try to do it with messages.

In their learning and teaching spaces, Ruby commented: “I teach digital marketing. Something I do now is to open and end the class with questions. Yep, all the ‘News and goods’ and those kinds of topics when the attention [of the students] is drifting away from the course”. And, also in her activism and Land defence spaces, Marina shares:

> If we apply it in our own organizational spaces, I think that talking about emotions and how this political work affects us in that sense is very necessary. It is very important and I hope we can create more spaces for this.

These applications of the emotional tools show how important their community and mutual support is to the participants at different levels, resonating with Klassen and Galway (2023): "Being involved in climate action means being involved in community…It provides support systems for grief and anxiety spawned by climate change" (p. 49).

One thing five participants identified as a possible utility of the emotional tools shared in the course was in preventing conflict or aiding in conflict resolution in their activist circles. For example, Yoco shared:

> I believe that if we practise it [pause, stay quiet and listen], we will avoid a lot of things because we are usually reactive activists; we obviously never think about what can happen until it happens. I think that if we put it into practice beforehand, we will avoid so many problems and upsets, we would save time and unnecessary steps.

This attention to managing potential conflict connects to Gravante and Poma's (2016) work when they write about the importance of creating spaces for people with a common identity with shared values and struggles to do collective emotional work. Doing so before things get too heavy or before there is a public display of emotions like anger can prevent damage to the struggle.

Impacts on Their Learning Processes

This theme encompasses participants' experience with the climate science component of the course, focusing on their perception of the impacts of the emotional tools on their overall science, specifically their climate science, learning process, and reflections and feedback on the combination of climate science and emotional tools conducted in the course. This responds to my third research sub-question: *Can peer-to-peer emotional tools impact climate science learning or learning in general?* Also included in this section are some comparisons of the participants'

previous experiences of learning science and their perceptions of the benefits that the strategy of integrating education with emotional tools could have for students of any age, although mainly at school age.

Integrating Climate Science and Emotional Tools

This subtheme explores participants' descriptions of their experience with the combination of emotional tools and climate science learning in the course. By comparing these experiences with their past science learning experiences, participants reported enhanced engagement and deeper understanding was obtained through this integrated approach. The course's climate science component was particularly noted for its effectiveness in making complex concepts more accessible and relatable, and participants appreciated the collaborative co-creation of the course syllabus to meet their needs. Participants also reflected on the knowledge they acquired during the course, emphasising its impact on their understanding of climate science.

Participants compared this experience with previous experiences of learning climate science and other subjects such as Mathematics, Biology, Chemistry and even History. In doing so, they raised the learning difficulties they had encountered in their schooling years. Six of the seven participants spoke of the educational trend in Mexico of "learning by memorising" instead of seeking meaningful learning through experiential or process-based teaching, while recognising that this could correspond to high teacher workloads and lack of economic and educational resources for teacher training or educational support materials for students. This problem is well known in the Mexican population (Guichard, 2005). There are other factors as well; families also play a significant role when making comparisons or demeaning comments regarding school performance, as reported by sacni:

> My sister is studying mathematics in the Faculty of Science and, since I was a child, when I had math assignments... even though she is younger, she would grasp it faster than I did. And my mom always pointed it out. She would say, 'Your sister is smarter' and stuff like that. So, I think that might have been what made me say 'No, science is not for me, it's for my sister, I like other things'.

In addition, other factors that can affect learning, such as neurodivergence, were mentioned by Ruby and Paola.

It is important to mention here that five participants do not have a science background. When asked how they would describe their knowledge of climate science before the course, all of them said "very basic." Two participants have university-level scientific education and their reported previous climate science knowledge was described as "wide" or "deep."; these two said they were interested in learning other ways to teach climate science and the emotional tools for themselves and their collectives. For example, Marina, who has a background in environmental sciences, said:

> I think it's nice to sometimes get out of the space of running, organising, directing and all. And for me, for example, going back to basic concepts, to hear things that even though I already knew them, to hear them again, maybe I didn't have to pay the same stressed attention to them that I had to pay when I had to learn them [at university], right? It was very useful, I think. And well, the emotions thing is extremely valuable.

Among the things that the participants mentioned that helped them learn the science component was that it was a dynamic class using diverse strategies (storytelling, examples, metaphors, diagrams, videos, questions for the students). I addressed technical themes in simplified ways to help them understand even if they did not know that much about science

already. I also regularly paused to ascertain how they felt about the information or if there were any feelings that prevented them from asking clarification questions. Erika described her struggles with another science course compared to the one we did together:

> Learning about science does challenge me. Because, in fact, I am also now in a diploma course on traditional medicine and there is also science. Suddenly they talk about molecules and this and that and the other, and the same thing happens as with the climate topic: the ozone layer, the carbon. Often, I hear them but I say, "I'm not going to [be able to] learn them." But when you explain it with metaphors and very everyday examples, I do understand it. So that's what stays with me. And I know what the process is, more or less, without learning all those complicated terms to pronounce. I think that climate science can be complicated for me, but when you learn it in a very dynamic way, I can, like, get to appreciate the science.

All seven participants mentioned that one thing that helped them learn and stay attentive was the passion with which I approached the topics. However, when I asked whether there would be much difference in their climate science learning outcomes if the course had been given by someone else less passionate about the topic, using the same strategies and the same emotional tools and the same climate science content, Ruby explained:

> Yes, I think it would still work with that mix because there would be different stimuli. I mean, it would not be just one person explaining something specific, but there would be a more interactive class dynamic. So, that helps to keep my attention. Maybe not so much; maybe I would still get distracted from time to time. But it would help…I feel that the merging [with the climate emotion tools] did help me to learn more about science.

Speaking more generally about their learning journeys, Marina, sacni, María and Paola reflected on feeling an obligation to learn to maintain good grades, having to memorise terms to pass without truly learning or understanding, and feeling the need to compare themselves or compete with their peers, which often created a sense of "not being smart enough" to ask questions. These findings echo a critique of the dominant school systems that relies exclusively on information transfer, resulting in people tending to hold information in their short-term memory, use it for a test and then let go of it instead of truly understanding it and saving the information in long-term memory (Young, as cited in Louv, 2011, p. 32). This course was different from those experiences given the participants were intrinsically interested in climate change, there was no testing involved, questions were encouraged, and the emotional tools helped disrupt the competitive environment.

Reflecting on the integration of the emotional tools with climate science, all participants shared that they found the approach valuable. For example, María shared:

> It seems to me that having these tools and at least having those spaces within the classes themselves, where you can feel confident to express yourself without the fear of being judged, was useful to me because I also see it as another way to learn. Another way because I know that I have the undivided attention of my classmates and my classmates also have my attention.

María highlights how using the peer listening exchanges was a catalyst to feeling more confident in the learning environment as it allowed her to ask more questions; in the past, she would not have felt comfortable with asking questions for fear of being judged. Also, knowing that in the listening circles she had the attention and respect of her peers and mine, and that we were not there with competitive intentions, helped her to ask the necessary questions to help her better

understand the science topics. That, in turn, allowed her to feel more confident in her knowledge and her work as an advocate for the Earth.

One of María's goals in taking the course was to learn more about climate science to overcome her fear of being discredited in various climate workspaces for not knowing "the science" or for being Indigenous. Paola, educated as a biologist, made a comment in a similar vein but took it in a different direction:

> What changed the most was my emotional connection to these issues, because I don't feel the need to suppress my emotions so much anymore, but to let those uncomfortable feelings come up....When you learn about climate science, it's like, "Everything is wrong. Everything has been wrong for a long time and will continue to be wrong, unless" and at that point there are always two perspectives: 1. "Unless you change", or 2. "Unless the system changes, which you can't do anything about." So, there is always a sense of hopelessness. That's why I feel that emotional tools and climate science learning always have to go hand in hand because how do they expect us to learn from these issues, or especially, how do they expect younger people to learn from this, knowing that it's going to hit them harder than people who are in their 20, 30, 40s? And also, knowing that the teen years are a journey of such intense emotions, how do they expect young people to be able to learn this without having these kinds of tools? So yes, I would even see them as vital in environmental education, or climate science education.

The support for integrating emotions and climate science reminds me of Poma (2018) who wrote there is enough evidence now in the literature to say that emotions and cognition are always connected and need to be better integrated in teaching. Unfortunately, we still have a long

way to go since there still are few learning or activist spaces that take such an approach (Galway & Field, 2023; Verlie et al., 2021).

Benefits for Students

In this sub-theme, I explore participants' perspectives on the possible benefits of combining emotional tools with climate science education across various age groups and educational levels. Participants provided examples and opinions on how integrating emotional tools could make learning about climate change less intimidating and more engaging, especially for students in K-12 settings. Participants argued that by addressing climate emotions directly, educators can help students manage feelings of fear and anxiety and foster a more supportive and productive learning environment. For instance, participants suggested that peer listening circles could help young learners process their emotions, making the climate science content or any content more approachable and less overwhelming.

Among the things that stand out the most in the interviews is that all participants shared how the emotional tools helped them to be less distracted. When asked if the merging of climate science with climate emotions tools helped them in their learning process, Paola answered:

> Yes, you know, it actually helped me to not get so distracted because that's something that happens to me. I am a person who is easily distracted, so many times, whether I was in my in-person science classes, or when they were virtual, or when I was learning on my own about climate change, sometimes I had to force myself to learn about these topics, I would even get angry with myself....So something that I realized is that in this course, my tendency to get distracted decreased. Maybe it was those repressed emotions that I had, which I had not worked on...and they were in a very small box and there were a lot of

them. But yes, yes, I realized that I paid much more attention than in any class I had ever taken before.

Participants also believe these tools would have made learning more enjoyable in their school years by providing them with more outlets for expressing emotions. sacni's experience reflects the lack of space within school settings to identify and express feelings:

> I was the girl who got the stamp of the parrot.[4] I was the girl who talked a lot in class and, I mean, I think it was because there was no space to talk like that except at recess, and at recess you only had time to eat and play, or take cover from the boys' footballs.

Participants also thought that the approach we took in the course had the potential to be more inclusive. As an educator and a self-identified Land defender, Erika said:

> I feel it could be a new model of education that is more inclusive and more socio-emotional. I don't know if calling it this way is correct, but as an educator sometimes you find yourself in difficult situations with children in which you ask yourself: "How do I help them?"

Similarly, it was mentioned that the approach we took could be helpful for neurodivergent students or students with learning difficulties, not only for learning climate science but all subjects. Ruby talked about their experience:

> The truth is that I, as a neurodivergent person, believe that these types of tools would have helped me a lot, first to learn more and second to understand myself better, you know? I feel that being neurodivergent is quite difficult, and when I cannot learn something, I get frustrated and angry. Several things happen and well, in school there is no class that teaches you how to manage these kinds of things. So, I feel that if I had

[4] In Mexico, a teacher might put a parrot stamp on a student's workbook to indicate to the student and their parents or guardians that the student talks too much in class.

> learned about these kinds of things since I was little, it would have made a big difference; learning and growing up would have been easier.

Ruby also thought that this approach could be used in teaching about other loaded subjects that will feel familiar to Canadian readers given the context of "Truth and Reconciliation" (McGregor, 2018):

> I think this strategy could help with collective care in the school context because there are some very ugly topics, right? Very heavy ones that go like, "Well, that's how they killed most of the Indigenous population of Mexico. Okay, now let's go to mathematics." Ugh! I feel that since there is no transition tool, it desensitises people. And if, for example, some kid feels bad about that, they're like, "Hey, what? Let's see...wait, what happened here?" And they're processing it. And then they [teachers] say, "Stop, don't feel, didn't you hear? Let's go with math." I feel it's even violent, isn't it? For example, I feel that this would help because, I mean, already in math class, you, a sensitive person with emotions and feelings, you are not even thinking about math. As a person with ADHD, that happened to me a lot.

Ruby's goal in taking the course was to have a safe and accessible learning space that allows them to express their emotions to facilitate their learning as a neurodivergent person with ADHD, because since childhood they encountered violence and neglect in educational spaces due to ableism and a lack of strategies for neurodivergent people. In spite of their passion for learning new things since they started school, they had a hard time learning, even when they were able to hyperfocus, because they tend to have emotional crises after learning something new and distressing such as environmental issues.

The findings in this section address one of the aims of my study, which is to explore if peer-to-peer emotional tools can be catalysts for learning for people with science learning difficulties. The things participants shared about their previous and course learning experiences and their reflections on what might help current schools resonates with Cranston's (2022) assertation that there is insufficient attention paid to socio-emotional learning throughout people's lives. It is possible that this is not a recent problem, but one that has been faced in "modern" education and that is coming more to light as we start to recognize the emotional effects the climate crisis has on the entire population, including students of all ages around the world.

Another such issue relates to Ruby's reference to the genocide of Indigenous peoples in Mexico and her assertion that integrating socio-emotional learning into learning about difficult topics such as "Truth and Reconciliation" would be helpful, both for students and educators. I see possibilities in comparing and integrating strategies used in learning about climate change and decolonization education. This might allow students to regain their agency through understanding the interconnections between colonisation and the climate crisis (Alexander et al., 2011; McGinty & Bang, 2016), broadening both the perspectives and the reach of their actions and opening up space for Western scientific knowledge and Indigenous knowledges to meet (Alexander et al., 2011; Godden et al., 2021; Jones & Davison, 2021).

In general, the participants' support for weaving climate science learning and emotional tools resonates well with the literature that suggests this approach might open up the possibility to view climate science as a matter anyone could engage with (Jones & Davison, 2021). As the participants suggest, it also creates space for socio-emotional learning that may help improve students' and teachers' well-being generally (Chawla, 2020; Ojala, 2012).

Impacts on Their Activism

This third theme responds to the research sub-question: *How do peer-to-peer emotional tools impact how activists perform their activism?* In this section, I explore the participants' reports on the impacts of the emotional tools, or the course as a whole, on their activism. Their interviews involved discussion of their experiences before, during and after taking the course, and I was particularly curious about their experiences of burnout, the strategies that have helped them to cope with it, and whether they consider the emotional tools in the course could help reduce the recurrence of feeling burned out from their activism.

When I asked about difficult aspects of their activism, a variety of concerns emerged, including participants reporting having: a huge work overload; difficulty in defining the roles of each person in a working group; difficulty sharing knowledge of climate science with their families, friends and communities; trouble getting family and friends to understand their work; feeling judged by others who do not understand the importance of defending the Land and addressing the climate crisis; risky situations or threats to their own person or family; oppressions within activist groups (predominantly sexism, adultism, ableism, classism and racism) that led to violence and internal conflicts; elitism in climate work spaces such as the UNFCCC Conferences of the Parties (COPs); hardship in finding or making time for personal or collective care; and the emotional toll of being involved in climate activism and defending the Land. Since the focus of this research is not about understanding those types of challenges in depth, I did not inquire about details nor were many given. The key relevant takeaway here is that the challenges of the work they do can lead to significant emotional strain. The emotions participants identified included anger, fear, anxiety, powerlessness, sadness, and hopelessness, which are consistent with the most common emotions reported in the literature on climate

activism (Bell et al., 2022; Galway & Field, 2023; Hickman et al., 2021; Ojala, 2021; Poma, 2018).

In discussing her work, Marina discussed the stress she sometimes felt when bringing together her professional and personal worlds. She said:

> I think that sometimes, from the outside, many things are not fully understood: what one is doing when speaking about the Land defence or climate activism....Perhaps it is also a matter of communication, of how we can dialogue or how we express what is fundamental for us, which is to be able to say that this climate crisis is the result of inequalities and all such things. Sometimes I feel that for us it is very clear in our heads, but we do not live in a world where it is so clear in all heads. And that makes it very complicated, doesn't it? It is complicated, for example, to talk about what I do both professionally and politically, with people in my family or friends who are not in this sphere.

Marina further explains:

> All the elements of risk add up; for example, living in a country that is not very benevolent when you are naming the projects or mega-projects that are installed by the state that are contributing to the climate crisis. This endangers us, not only emotionally, but also physically, right? These are all different levels, from the very small things, like where it is difficult to tell my aunt, that aunt who is very close to me, but who at the same time is very distant [to the climate movement]. I mean, how do I tell my aunt that the life she lives is also part of this situation? I mean, yes, how do I manage to convey this and also without suddenly messing up personal relationships? Or, well, maybe another example. My best friend's boyfriend works for a company that is doing something

> [harmful] in my territory. So how do I talk to my friend about what I do, when it directly affects her personal life, her private life and her daily life, right?

Erika also refers to the risks of her activism to herself and her family, from a selfless perspective:

> There is a concern about the position of vulnerability in which I put myself in certain situations and the fact that I don't have the tools to know what to do if something happens; for example, if they try to intimidate me. What do I do immediately? These are some of the things I have asked myself.…Especially with the people closest to you, you put yourself in a situation of vulnerability, but you are aware of it, you assumed that. What can happen in case of a threat to you? To a certain extent you assume it, but when it involves your family, then it touches more sensitive fibres. That, recently, has really bothered me a lot.

It was clear that their activism creates challenging situations for participants as their professional and personal lives collide.

After acknowledging some of the hardships she experiences as a Land defender, Marina suggests that the emotional tools we used in the course can be especially useful in certain moments:

> I think that this [listening circles] can even be an exercise to release tension, in highly tense moments. For example, there are meetings or assemblies that become very tense and I would never know what to do. Now I could suggest, “Let's make a little [listening] circle, just to relax, and then let's talk about the birds that you have seen today.” And then see if that way the energy is redirected in a different way. I don't know; that's what I've been thinking about since we were doing these exercises. Then, for instance, I think about the people who have been on this path for longer, like my mom. I think of her fellow

> defenders who are older, over 60, 70 years old. They are also usually very foolish, like, "Things are as we say" and, in other words, in the old-fashioned way. This is what is now called adult-centric thinking, which we used to call "when your father commands you, you follow orders" or "because your mother says so or "because the leader says so," "because the person in charge says so," right? I think that precisely in those spaces there is a great need to be able to exercise other forms of communication, to exchange and to manage emotions because precisely in their childhood, they were never given the space to be able to do it.

In this excerpt, Marina refers to her mother who is a well-known Land defender in Mexico, providing the perspective of someone who grew up in the Land defence scene, became involved in climate activism in her university years, and who has observed behaviours that are connected to a lack of emotional tools, not only to cope with climate emotions, but to learn to manage all kinds of emotions that arise in activism movements, including when people from different generations and contexts come together in organisational spaces to address the climate crisis. Such spaces, according to her perception, could benefit from the use of listening circles as they transform opinion-loaded discussion spaces into a receptive and thoughtful process of speaking, as long as people are willing to do so, and fostering better understanding and building and strengthening interpersonal connections to solve social problems (Itzchakov & Kluger, 2017a,b).

Ruby brought to the table an issue that speaks to an aspect of Marina's concern, that of the many problems big egos cause in activist movements. Ruby shared her thoughts on how the emotional tools might help:

> I feel that in the climate movement there are many egos and there is a lack of building up the collective. I think the tools could help to have more empathy and understanding

among activists. And that could help to lower the ego of those people who want to do everything on their own or in their very own way.

Turning now to conversations around burnout, Erika, Maria, Marina and Yoco all mentioned their heavy workload and not having enough helping hands in the work teams of their collectives. That has resulted in an emotional burden as they feel exhausted and do not have the capacity to do more nor to rearrange their schedules, which leads to guilt since their activism has become a big part of their lives mainly due to the fact that their lives or the well-being of their Land and/or their communities depend on addressing the devastation caused by the climate crisis. Maria said:

> I have thought about giving up on several occasions....it is very tiring at times, especially when you attend forums that are "very institutional" or "very formal," where there are hours and hours in which many things are said but nothing seems to change. I think that when I have been in those spaces are the moments in which I have felt more tired and I have said, "I don't know what I am doing here when I could be doing other things." I think that the other side I see of Land defence work is precisely these relationships in the communities or within your family or with the relationships with your fellows who are in the same struggle. I think that part of feeling accompanied and listened to is what brings me back to saying, "Yes, we can do it in other ways."

Along the same lines, but from the perspective of someone who grew up in a big city, sacni comments:

> It's hard to see that one always looks for this aspect of being hopeful, of not falling into fatalistic narratives, but sometimes it's very complicated. I mean, you have to face this part of fighting, this part of always wanting to be in agreement with people or being

> positive from inside, but also facing the whole external system that doesn't let us rest, so it's very painful. Of course, sometimes I feel super burnt out and sometimes I kind of turn off, I kind of ignore some groups, some chats for a while or I say, "You know what? I'm not going to participate in this space, I'm not going to attend this event because I'm really tired"....I know that I need very strong energy, a very strong power that I don't have at that moment; I mean, it will hurt me to see many things, it will hurt me to listen to many things. No, I'm tired.

Ruby, who also carries out her life and activism mainly in urban environments, says: "When there have been very intense situations...it gives me a lot of anxiety and I feel that I can get burnt out. And then I shut down and walk away and do nothing for a while."

Yoco mentions that, after years in the climate struggle, he is finally learning some strategies to combat burnout:

> So far, I'm just sorting out my time, figuring out what I can do and what I cannot do. I'm working on not feeling bad about saying no, because telling everyone, "Yes, I can do it, I can do it, I'm doing it," was saturating me.

Ruby, sacni and Paola all talked about distancing themselves as a strategy to counteract burnout, but this highlights the privilege they have in not belonging to a frontline community; they have the possibility of distancing themselves, to "not see the problem for a while" in contrast with the other four participants. Yet that ability to distance oneself can also bring about feelings of guilt, which resonates with Flam (2005). Paola talks about guilt as a mobilising emotion that can also be unhealthy:

> I think that what creates the most conflict for me is the privilege that I know I have had all my life and that I spent a large portion of my life not being aware of it, until I talked to

> other people who have not had it. And I think this is closely related to what I said earlier, of feeling that I have a kind of debt. I think, "How can I not do this every minute of my life, if I know that there are people who are having a lot worse times than I am?" I think that is the unhealthy relationship I have with activism. And given that, a lot of times what happens is that I force myself to suppress my emotions in order to do even more things, when in reality that ends up being worse, because I end up being tired of myself, of the world, and I end up doing less things that, for sure, if I had dealt with these emotions from the beginning, I could have done more things. I am not saying that productivity is the best thing; I mean, I could have done more things that would bring not only more wellbeing to my community, but also more wellbeing to me.

Aside from distancing, Erika discusses how listening circles could be used as tools to counteract burnout:

> I consider that those spaces are like allowing yourself to have a space for yourself as well. A lot of times it's like, "Okay, it's too much work. I'm about to send everything to hell and rest." But sometimes all you need is to give yourself a little time for yourself and be able to share and get it out, and, after that, it's like recharging the battery and saying, "Well, I would also like to do this." You just have to learn how to balance that part of making time for yourself, healing and expression. The simple fact of just the talking and that moment for you, that you allow yourself that moment, when you are not doing anything else. You are simply expressing yourself.

Ruby further adds that these listening spaces can counteract feelings of loneliness and isolation:

> I feel they help you not to feel lonely, you know? I think sometimes when we get into a state of burnout or a lot of eco-anxiety, it gets very difficult. One thought that comes to

> me frequently is, “Truly, no one in the world cares,” but when you're in a listening circle, you realise that other people feel like you do or you see other perspectives on things...or you notice that you're not the only person in the world who cares at this level.

Ruby’s thoughts resonate well with what Ojala (2021) and Hickman (2021) said about the problems associated with the individualization of emotions and solutions. There is a tendency to experience ecoanxiety alone and in isolation for fear of upsetting those around us, especially if we perceive that those around us apparently do not care as much about what is happening on the planet as we do. Yet, as Klassen & Galway (2023) suggest, being part of a support system is a helpful way of addressing these challenging emotions. When I asked Paola if they consider collectivity, as promoted in the course, helps prevent burnout, they replied:

> Yes, yes. It helps more than isolating yourself. Definitely yes. I have always thought that the community brings its conflicts. It brings its things that we have to overcome, but I think its opposite doesn’t bring any benefit. And I say this as a person who has a hard time with collectivity. Many times it even scares me, it makes me panic. But inside me, I know that the moments where I have felt the least distress is when I am surrounded by people who share those same emotions as I do.

The findings in this section illustrate well why I chose to do this study with activists, because experience has led me to believe using emotional tools has some utility. I wanted to more formally explore how emotional tools, in particular listening circles, could be important for climate learning, and also to enable people, especially those involved in addressing the climate crisis, to listen to each other, collaborate, co-create ideas and make decisions based on deeper and more respectful relationships. As I suspected, these can help reduce burnout that can lead

some to want to abandon their advocacy work. This finding reinforces the sparse extant literature on this issue (Gravante & Poma, 2016; Janusik, 2023).

Impacts on Their Mental Health

This theme is organised into two subthemes: 1) Perspectives on the emotional tools, and 2) Managing emotional tools and safe spaces. The participants discussed the impacts of the emotional tools learned in the course on their mental and emotional health, their connection to their own emotions and their experiences before, during and after the course, and their reflections on institutions or professionals managing "spaces for emotions." This theme emerged as a conjunction of the four research sub-questions, paying special attention to the emotional component of the course and the impact it did, or could have, on the mental health of the participants.

Perspectives on the Emotional Tools

This sub-theme encompasses participants' overall judgments and specific experiences with the emotional tools presented in the course, highlighting both the value they attributed to these tools and their personal encounters with them during the learning process.

Maria, Erika, Paola and Marina mentioned the initial challenge they felt in opening up and being vulnerable with other people, some of whom they did not know prior to the course. They also noted that this type of vulnerability is socially stipulated in Mexico to be shared only with close friends, family or your partner. They found, however, after noticing that there was no pressure or judgement and that there was empathy and no interruptions or unsolicited advice in the listening circles, that they gained confidence in themselves and in the other people in the group. They reported that this enabled them to better use their time when it was their turn to talk

and share their emotions, and that the circles become spaces for catharsis.

Marina elaborates on the building of trust:

> At the beginning honestly, I was even a bit mistrustful. Like, “Well, I don't know these other people, I don't know what I can tell them, what I can't tell them, what I have to tell them, what I don't have to tell them, I know some of them, but we didn't always have spaces for dialogue with them in this way.” I had that feeling in the first half of the course. In the second half I kind of felt that something was unblocked, it was like, “Well, it's also a space for me to stop over-analysing if I have to be taking care of myself,” you know; sometimes it's good to know that there are healthy and caring spaces, where you can just let it all out.

Paola provides her opinion of the emotional tools, linking it to her experience of using them in the course and the impact it had on her emotional wellbeing:

> Now it is one of my favourite tools, because it helps me to realise that I am not alone when it comes to my emotions, but it also helps me, on a more personal level, to come out of my shell a little bit, because I am a person who sometimes finds it a little bit hard to open up emotionally to other people for fear of being judged, for fear that what I am saying will sound foolish. And I don't know, especially the conditions in which we all find ourselves nowadays, which encourage us to isolate ourselves more and more....I don't want it to sound corny, but, for me [listening circles] are my favourite tool, because I feel it is like the antithesis to everything we are suffering nowadays. It’s hard for me to open up, yes, but I know it's necessary....I think one of the most important things I take away from the course is that I always feel responsible for other people's emotions, so, when Malinali comes and tells us, “We are going to do a listening circle, but one of the

> main rules is that you can't make any comments when you listen, you don't have to offer help." I was like, "Wow, what is this, she is stopping me from doing something that for me has always been, well, mandatory to do." So, by no longer feeling, or at least reducing the feeling, that I am responsible for other people's emotions, I now feel my relationships are more personal. At least I no longer put up that barrier so much; I mean, I no longer feel ashamed to relate to other people. So, yes, I mean, I definitely see myself continuing to use these tools in the future...because I saw the benefits it brought us. When we were taking these classes, especially before or after difficult subjects, I saw how much it calmed us down. Yes, I saw how much it either helped us to focus on getting everything out of our minds before the class started, or how much it helped us to calm down after learning about a topic that is difficult to absorb.

Paola hoped the course would help her to weave networks of trust, because she perceived that we are becoming increasingly isolated and companionship is becoming increasingly difficult to find, especially emotional companionship. She was grateful for the opportunity to create meaningful bonds with the other participants, to be able to face certain climate science topics that in the past she found difficult to approach, to personally have a healthier relationship with climate activism that does not set aside emotional well-being, and to learn to identify when to check in to her own needs, including when she needs support, pauses, etc. For her, then, Paola felt the objectives she had for the course were fulfilled.

For Erika, the emotional tools in the course helped her feel more resilient. She says:

> Besides everything that this exercise or technique entails, the important thing is that for me, personally, it has made me a more resilient person. I am no longer like I used to be,

> focussing a lot on the problem and staying there and having only negative feelings. I think this has made me a very resilient person.

That increase in resilience might be connected to the strengthening of relationships and reciprocity encouraged by the course and emotional tools, since reciprocal emotions like respect, love and trust help sustain activists (Bell et al., 2022; Gravante & Poma, 2016; Hoggett & Randall, 2018).

There were specific aspects of the emotional tools that participants wanted to talk about. All the participants mentioned their initial difficulties in either using all the time in the listening circles or having a challenge stopping in time as well as understanding that an equal portion of time was entirely theirs. For those who found it hard to make use of their time, after several practices they noticed that making room to pause and have an emotional check in between peers helped a lot, which resonates with previous research (Bell et al., 2022; Gravante & Poma, 2016; Hickman et al., 2021). As well, five out of seven participants pointed out how relevant the "attention balance" questions were for getting to know each other, increasing confidence, paying attention in class and not staying focused on the strong emotions. sacni said:

> Sometimes there were these tools that you gave us to ask random questions to bring us back to the present. That reminded us that, yes, we are emotion, but we are also something else. Then some of the questions were funny, right....And that would make me not get triggered by trauma or something like that, right? I mean, it was all good.

Maria described how important it is to learn to listen in order to also reflect on our own experiences:

> It is super important that we learn to listen and that this listening leads us, those who are listening, to reflect, because I think that this tool also offers you the space for you to

> reflect on what you are listening to, because you may have already thought or lived through what you are listening to. And I mean, like, you're not going to share that with anybody else. But at least as a reflection about another experience of something similar, in the other person's experience.…That is one of my takeaways from this tool.

Erika and Ruby both mentioned feeling like they mattered as a person thanks to the listening tools woven into the classes. That illustrates how quality listening sends the speaker a signal that they are interesting and worthy of attention (Itzchakov & Kluger, 2017a). Ruby further elaborates on how these tools contribute to managing their emotions:

> When you have a specific time to talk, I feel like you know you have that time and, like, "verbal vomit" comes up. And the verbal vomit helps a lot in understanding what's going on in your head. So that, personally, helps me a lot. I've noticed that when I verbalise what's happening to me, what I'm feeling, I feel so much better. So, having a specific space like this to be able to talk about it and feel listened to by others gives me a lot of calm, a lot of peace, and that helps me to manage my emotions better.

In this section, it is clear that these participants found the integration of the emotional tools was useful in many ways. The listening circles, in particular, were highly valued. The elements of a successful listening exchange mentioned by participants correspond well with the *Sustaining All Life* listening circles/exchanges guidelines, which are very similar to those established by Itzchakov and Kluger (2017a,b) who referred to the importance of attention, understanding (comprehension), and relational components (benevolent intention towards the speaker).

Managing Emotional Tools and Safe Spaces

Within this subtheme I document participants' reflections on their previous knowledge and practice of emotional tools before the course. Some had prior exposure to similar techniques through personal development activities or professional training, while others were relatively new to these concepts. Five participants expressed having some emotional tools before the course, mainly individual emotional management tools. These reflections, alongside what they learned in the course, provided insights into the ways in which these emotional tools could be used to create safe spaces in climate activist circles.

One participant expressed having some emotional tools they used personally, after having undergone psychotherapy, and a few mentioned tools they had used for improving the productivity of a work team. Only one participant expressed having no emotional tools at all before the course. None of the seven participants stated that they had specific tools for addressing climate emotions. Two of them mentioned that they have been part of what Janusik (2023) calls a "traditional listening circle" where people willing to share their thoughts hold a stick and can talk for as long as they wanted or needed, but these circles were not related to climate change or climate emotions. Regardless of their starting point, all participants acknowledged the value the course had for them in building their understanding and application of emotional tools.

Yoco, the only male participant, shared his emotional experience within the cultural context in which he finds himself:

> As a Mexican, even our culture leads us to never stop to listen to ourselves and feel. I mean, who listens to you? Who shares anything to anyone? It's difficult...there has to be a very strong connection for you to express an emotion. You have to be my very close

> friend for me to tell you something...or to the psychologist, once there is a psychological problem that leads us to that, then we express ourselves.

Although Yoco was not fully explicit about how his gender may have influenced his perspective, my previous experience suggests that emotional expression can be related to gender roles, with some emotions seen as more valid for one gender or the other (see also Ojala, 2021). However, as Yoco was the only man who participated in the interviews, it is not possible for me to make any conclusions other than my interpretation that gender roles might be one of the reasons there was in fact only one cis-man participating in the course and the interview, even though he is not the only man in the networks I am part of and who was invited to join.

While my research attempts, in a way, to follow the trend of breaking the silence around climate emotions by creating safe spaces, free of judgement, where people can share their emotions (Galway & Field, 2023; Godden et al., 2021; Verlie, 2021) through the use of peer-to-peer emotional tools, that does not mean that facilitating discussion of emotions is straightforward or free of risk. Ruby provided noteworthy feedback in that regard:

> I think they are tools that are designed so that there can be a certain type of control and support to regulate. And I feel that this can help, but I also feel that [in order to replicate them in other spaces], there has to be someone who has already been in more circles, and perhaps, who has taken a training on emotional support and regulation, because perhaps if someone is using the tool who may have a more intense moment [of emotional crisis], they have to be able to be supported. Otherwise, there could be a slight problem.

That is a very important point. Although the tools used during the course are meant to be "user-friendly" so that they can be replicated in different spaces, such as educational and activism spaces, it is key to learn about and follow the established protocols in order to avoid triggering

emotional responses of great magnitude and then not being able to provide impacted participants adequate support. In addition, it is important to recognize that these tools do not seek to replace any other type of tool or professional emotional follow-up, but rather to be complementary to them.

After receiving this feedback, I followed up with Ruby and asked her if she felt it was feasible or appropriate to have peer listening circles with someone like me who, while not a mental health professional, has resources to provide people if it feels like it is getting to be too much, or if she felt these listening circles should always be facilitated or supervised by a mental health professional. Ruby responded:

> I don't feel like it necessarily has to be a mental health professional. I believe that the idea that only a mental health professional can provide a space for emotional release is something very white [Western] because no, I mean, I want to talk about how I feel and I'm not going to be able to talk about how I feel anywhere because I don't have the money to pay for a mental health professional? I think it's stupid not to have a space to express emotions among peers. It can also be just a nice space, you know? I mean, because we are in Latin America, it is very hard to find other kinds of support; I mean, mental health is a privilege. So, I feel that the fact that there can be this type of listening spaces between caring people can help a lot and if people have the possibility of accessing other types of services or something like that, maybe it can also be like a first step, right? Like a space that helps them think, “Oh, it would be good to go to therapy.”

In a similar vein, when I asked participants if they think that social justice and climate activists could benefit from learning personal and collective care tools such as the ones in the course, sacni shared their perspective grounded in their experience not only as a climate activist

but as a person who recently became a volunteer in the Brigades for the Search for Missing Persons:

> They are usually [search] collectives, composed mainly of women, and they have spent their money searching....So, what do they resort to, for their wellbeing in a country like Mexico? Well, to the Church. So, many of these listening spaces are run by the Church....So, I don't think it has to be run (exclusively) by health professionals. And above all, in a context where what is most important is the need to work with what you have and, therefore, to be very self-organised. People who constantly manage these spaces, such as priests or pastors, are usually aware that families and volunteer seekers are of diverse spiritualities....So, there is also the criticism that it is necessary to promote listening spaces that are not necessarily run with the idea of having more followers or more worshippers, but rather as a secular listening space, considering that spiritualities are diverse, but that it does not necessarily have to be run by health professionals.

Taken together, the perspectives shared in this section point to the potential of emotional tools and spaces. As shared here, these can have a positive impact on activists' lives, contexts, advocacy work and mental health, and can act as one response to the current lack of climate resources or spaces to heal emotionally, physically and even spiritually (Bell et al., 2022; Cunsolo & Ellis, 2018).

Other Findings

As I noted in the previous chapter, participants provided valuable input into the course planning process. After the course was done, they also offered constructive feedback on both the planning and the course. Many appreciated the transparency and inclusiveness of the course planning, noting that being invited to participate in the research made them feel valued and

respected. Feedback about the course itself was largely positive, with participants highlighting the well-structured curriculum and the practical application of emotional tools. Some suggestions for improvement included having in-person sessions and additional classes to go deeper into the science content as well as having more time to share their emotions. Overall, the feedback shows general satisfaction with the course design and delivery.

The cultural context of emotions was another significant "other" finding. Participants remarked on how their cultural backgrounds influenced their perceptions and comfort levels with emotional display and sharing, and they also mentioned factors such as their gender, mental health, and experience of oppression or religion, which is consistent with the body of research on emotions of several authors (e.g., Bell et al., 2022; Clayton et al., 2023; Klassen & Galway, 2023; Pihkala, 2022).

Participants also emphasised that, ideally, knowing the other group members beforehand would be beneficial for building trust and facilitating open emotional sharing. Those who did not know many people, or anyone, beforehand found it took longer to build trust and feel comfortable expressing their emotions. However, it is also important to note that I had a preexisting relationship with all the participants and had built trust with those individuals, which did help. That was said to be key reason why some decided to be part of the research at all, and it helped facilitate trust in the other participants and the emotional tools themselves. Indeed, their relationship with me seemed to play a crucial role in their learning experience because participants reported it led to them to feeling a higher level of trust and engagement, which enhanced their overall experience and receptiveness to the course content. This highlights the importance of CBPAR principles as a framework to generate a positive impact in the community (Brown & Strega, 2015; Burns et al., 2011; Holder, 2015). These additional insights underscore

the multifaceted aspects that contribute to the effectiveness of emotional tools in educational and activism settings.

Summary

This chapter, organized into four major topics— impact in their lives and contexts, learning processes, activism, and mental health—connects direct references from the seven interviews with existing literature. Participants highlighted the course's collaborative and inclusive design, which fostered a sense of community and acknowledged the principle of reciprocity. All participants appreciated the supportive learning environment that encouraged active participation and mutual support. They emphasized the course's non-hierarchical nature and the facilitator's willingness to share feelings and experiences, which helped build a safe space for emotional and collective care.

Participants noted the wide diversity of applications for the emotional tools, from conflict resolution to improving interpersonal communication, learning improvement by reducing distracting factors due to emotional overload, and teaching strategies. They considered balancing their attention out of distressing emotions as a crucial strategy to move on from complex emotions. The course was different from participants' previous experiences as they were intrinsically interested in climate change, there was no testing involved, questions were encouraged, and the emotional tools helped disrupt the competitive environment. Peer listening exchanges boosted participants' confidence, allowing them to ask more questions without fear of judgment. In addition, addressing climate emotions directly helped manage fear and anxiety , fostering a supportive learning environment. This approach could be particularly helpful for neurodivergent students or students with learning difficulties. According to my findings, the emotional tools used in the course are user-friendly and can be replicated in various spaces,

benefiting activists' lives, contexts, advocacy work, and mental health, offering a response to the lack of climate resources and emotional healing spaces. Participants appreciated the transparent and inclusive course planning and provided constructive feedback, suggesting more in-person sessions and additional classes for deeper science content and emotional sharing.

Chapter 5: Conclusion

This thesis was born from my intention to contribute to the climate movement and to the climate change education field. I wanted to better understand whether, and how, climate emotion tools could be useful for learning climate science and for helping climate activists, or anyone worried about climate change. Could these tools help people become more resilient and able to recognize and navigate their emotions, turning them into a driving force that helps them to continue to take action to address the climate crisis rather than engaging in avoidance or burning out? I was seeking to add a fresh approach to the growing body of research on climate emotions, climate education and climate activism.

My study explored whether, and how, combining science learning and peer-to-peer emotional tools impacts youth and Indigenous climate activists' learning processes (especially those with science learning difficulties) as well as their activism and their personal lives. I also explored how such a course might help combat activists' burnout. I used a community-based research lens that influenced both the course planning and delivery; this approach was highly valued by participants.

Findings show that participants saw a high value in using peer-to-peer emotional tools in climate education and activism. They reported that it improved their own learning outcomes, and they felt that such an approach would be useful in teaching about not only climate science topics, but possibly all highly emotion-laden topics tackled in K-12 schools as well as in informal education such as in workshops and training in activism spaces. They also found it useful that I, as the facilitator, took on a non-hierarchical role and engaged with all participants on equal terms, which could be especially useful in activist learning spaces.

The reported positive impacts of combining emotional tools with climate education on the participants' lives, contexts, activism, learning processes, and mental health helps to answer my research questions. It also helps to fill the gap in the literature in this area, representing one possible response to the identified need for educational spaces where people can learn about climate change through their full range of cognitive, affective and bodily registers and for accessible, safe spaces for young people to collectively recognize, explore, and process complex climate emotions, as identified by several authors (Galway & Field, 2023; Jones & Davison, 2021; Klassen & Galway, 2023; Poma, 2018; Verlie et al., 2021).

One key element of my findings is that participants believe that socio-emotional learning environments should be embedded in every form of learning at every stage of life, which could help us move away from the dichotomy of "positive" and "negative" emotions that lead to the suppression of emotions to prevent the "fight, flight, freeze response" in education and activism spaces (Cranston, 2022). Emotion tools such as *Sustaining All Life* listening circles could be integrated into educational and activism environments to promote community building, to help participants regain agency through the exercise of knowledge, and to support social and civic engagement. I am sure these listening circles and the course itself could be enhanced further, so work with future participants could seek out more suggestions for practical improvements. Of course, the use of this emotional tool does not rule out the value of using other tools that could help transform emotions into actions to counteract the climate crisis and help foster connections with other people, with nature and to renew hope.

Since one of the limitations of this research is that all participants identified the crucial role my previous relationship with them had on building trust in the process of course planning, delivery and use of the emotional tools, I would recommend further research to replicate the use

of this approach when facilitated by others, including in contexts where there is no previous trust or existing relationship of facilitator and participants. Since there may also have been other factors in play, such as the cultural context of Mexico and its impact on emotional expression or genders of participants and facilitator, it is likely that results would vary within and between countries. It would also be interesting to compare the *Sustaining All Life* listening circles' methodology and structure with other emotional tools.

I also suggest conducting comparative interviews, before and after the course, to better assess the effectiveness of the emotional tools in dissipating, transforming or moving with the emotions participants reported having before starting the course. That could help identify any specific changes in emotional states. Follow-up interviews six months, or more, after taking the course could provide insights into the long-term impact of the tools on participants' emotional wellbeing, lives and learning. That also could address the concern that there has been almost no longitudinal research conducted in environmental education (Breunig & Russell, 2020).

As I come to the end of this thesis, I want to close by reiterating that in a world lacking social and climate justice, it is vital that we continue to listen to each other in order to heal both ourselves and the planet.

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Appendix A: Recruitment Text

ORIGINAL EN ESPAÑOL

Asunto: Invitación a participar en investigación sobre herramientas para las emociones climáticas

¡Hola!

Muchas gracias por ser parte del curso “Ciencia climática y herramientas para las emociones climáticas”, espero que lo que aprendiste en estas clases te sirva mucho en tu andar, para mi fue muy grato tener la oportunidad de enseñar y, al mismo tiempo, aprender juntas.

Como sabes, estoy haciendo mi tesis para Evaluar el Papel de las Herramientas para las Emociones Climáticas en el Aprendizaje de las Ciencias Climáticas y me gustaría que fueras parte del estudio para entender un poco más sobre esto. Si te es posible, agendaríamos 45-60 min para que te entreviste por Zoom.

En este correo está adjunta una carta con la descripción más detallada de mi investigación, así como el formulario de consentimiento, el cual puedes firmar digitalmente y enviarmela por este medio si decides participar.

Quedo atenta para cualquier duda o comentario que te surja para decidir si participar o no en este estudio.

Nuevamente gracias por considerar esta invitación.

Un abrazo,

Malinali

Subject: Invitation to Participate in Climate Emotions Tools Research

Hello!

Thank you very much for being part of the course "Climate Science and Climate Emotions Tools”. I hope that what you learned in these classes will be very useful in your journey. For me, it was very nice to have the opportunity to both teach and, at the same time, learn together.

As you know, I am doing my master’s thesis, Assess the Role of Climate Emotions Tools in Climate Science Learning, and I invite you to be part of the study to understand a little more about this. If you would you like to participate, we would schedule a 45-60 min interview with me, through Zoom.

I have attached a letter with a more detailed description of my research, as well as a consent form, which you can sign digitally and send to me if you decide to participate.

I would be happy to answer any questions you may have before deciding whether or not to participate.

Thank you again for considering this invitation.

Best regards,

Malinali

Appendix B: Letter of Information and Consent Form

English version

Faculty of Education
Malinali Castañeda Romero
mcastae@lakeheadu.ca

Assessing the Role of Climate Emotions Tools in Climate Science Learning with Youth and Indigenous Climate Activists from Mexico.

Description of the Study and Consent Form

Dear Potential Participant:

You are currently participating in the non-credit course I'm leading, "Climate Science and Climate Emotion Tools." I would like to invite you to be part of an interview for my Master of Education thesis study exploring the role climate emotion tools can play in climate science learning and climate activism.

Before deciding whether you would like to participate in this study, please read this letter carefully to understand what is involved. After you have read the letter, please ask any questions you may have. You are under no obligation to participate in the study and your decision to participate, or not to participate, will not affect anything about the course you are taking with me or our previous relationship.

Description of the study: The purpose of this study is to explore how learning emotional tools as part of climate science learning impacts youth and Indigenous climate activists. For example, can peer-to-peer emotional tools be catalysts for learning for people with science learning difficulties? Might it help combat burnout in activists?

This will help me understand, as a researcher, if there are any perceived benefits associated with combining science and climate science education with emotional tools to improve learning and promote mental health practices in students and activists.

Interviews: A Zoom interview would last about 45 to 60 minutes. Participation is voluntary. Being part of the "Climate Science and Climate Emotion Tools" course does not obligate you to be interviewed. If you choose to be interviewed, you may refuse to answer any question or stop at any time without any kind of penalty or consequence. You may withdraw your participation and interview data for up to a month after you receive the transcript from your interview.

I would ask questions about your thoughts and feelings during different parts of the course, as well as your perception of how your climate science knowledge is changing, and your thoughts and feelings about burnout and self and community care practices. I will ask you what things are difficult about learning climate-related topics, what things are difficult when doing climate activism, and what things from the course were helpful to you personally, and as a climate activist.

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mcastae@lakeheadu.ca

If you agree, I will audio-record the interviews and will give you a transcript for you to review in case there are any clarifications or adjustments needed. You will have two weeks to request any changes to the transcript before it is considered for the data analysis.

Risks & Benefits: No known risk is associated with participation in the study; however, some questions might cause discomfort. If you feel uncomfortable during the interview, we can stop at any time. If this discomfort becomes a trigger for emotional distress, you can turn to the following free mental health helplines:

UNAM. Ayuda Psicológica a Distancia – 55 5025 0855
Atención en crisis y contención psicológica (República Mexicana) - 800 221 31 09

You may also request more resources from me for managing big emotions or recommendations for mental health care near you.

Although there are no direct benefits to you from participating in this research, we hope that by understanding the impact of including climate emotion tools in climate science teaching for activists, we can recommend ways to improve climate science teaching and make climate activism more sustainable and effective.

Confidentiality & Data Storage: You may choose to have your name used or to remain confidential by using a pseudonym of your choosing.

All interview data will be safely stored in a password-protected USB memory in Dr. Paul Berger's locked office at Lakehead University for a period of seven years and only the researcher's will have access to them.

Research Results: Research results will be shared in my master's thesis and at a public online meeting with the organizations and networks that are connected to the course. They may also be published in a popular article or peer-reviewed journal article and shared in conference presentations.

Researcher Contact Information:
Malinali Castañeda Romero – Educator and Researcher, Master's in Education for Change Student
Faculty of Education, Lakehead University
955 Oliver Road, Thunder Bay, Ontario, P7B 5E1
email: mcastae@lakeheadu.ca tel: +1 807-357-8125

Faculty of Education
Malinali Castañeda Romero
mcastae@lakeheadu.ca

Dr. Paul Berger
Associate Professor
Faculty of Education, Lakehead University
955 Oliver Road, Thunder Bay, Ontario, P7B 5E1
email: paul.berger@lakeheadu.ca tel: 1 807-343-8010 ext 8708

Research Ethics Board Review and Approval:

This research study has been reviewed and approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at 807-343-8010 ext. 8283 or research@lakeheadu.ca.

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Consent Form for Potential Participants

MY CONSENT:

I agree to the following:

- ✓ I have read and understand the information contained in the Information Letter
- ✓ I agree to participate
- ✓ I understand the risks and benefits to the study
- ✓ I understand I am a volunteer and can withdraw from the study at any time during and up to one month after receiving the transcript of my interview, and may choose not to answer any question
- ✓ I understand that the data will be securely stored at Lakehead University for a minimum period of 7 years following the completion of the research project
- ✓ I have the right to chose if I want to remain confidential or if I want my name to be used
- ✓ All of my questions have been answered

By consenting to participate, I have not waived any rights to legal recourse in the event of research-related harm.

Interview # ____

☐ I consent to the interview being audio-recorded **or** ☐ I would prefer that notes are taken

☐ I would like to remain confidential by using a pseudonym of my choosing in presentations and writing about this research **or** ☐ I would like my name used in presentations and writing about this research

_____ _____

Signature of the participant Date

Spanish version

Facultad de Educación

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Evaluando el Papel de las Herramientas para las Emociones Climáticas en el Aprendizaje de las Ciencias Climáticas con Activistas Climáticos Jóvenes e Indígenas de México.

Descripción del estudio y carta de consentimiento

Estimadx posible participante:

Actualmente estás participando en el curso sin créditos "Ciencia Climática y Herramientas para las Emociones Climáticas". Me gustaría invitarte a formar parte de una entrevista para mi estudio de tesis de Maestría en Educación que explora el papel que las herramientas para las emociones climáticas pueden desempeñar en el aprendizaje de la ciencia del clima y el activismo climático.

Antes de decidir si deseas participar en este estudio, por favor lee atentamente esta carta para comprender de qué se trata. Una vez leída la carta, por favor haz todas las preguntas que necesites. No tienes ninguna obligación de participar en el estudio y tu decisión de participar, o de no hacerlo, no afectará en nada al curso que estás tomando conmigo ni nuestra relación previa.

Descripción del estudio: El propósito de este estudio es explorar cómo el aprendizaje de herramientas emocionales como parte del aprendizaje de la ciencia climática afecta a lxs activistas climáticxs jóvenes e indígenas. Por ejemplo, ¿pueden las herramientas emocionales entre pares ser catalizadoras del aprendizaje para personas que han expresado tener dificultades para aprender ciencias? ¿Podrían ayudar a combatir el agotamiento ("burn out") de lxs activistas?

Esto me ayudará a comprender, como investigadora, si se percibe algún beneficio asociado a la combinación de la enseñanza de las ciencias y las ciencias climáticas con herramientas emocionales para mejorar el aprendizaje y promover prácticas de salud mental en estudiantes y activistas.

Entrevistas: Una entrevista por Zoom con duración entre 45 y 60 minutos. La participación es voluntaria. Formar parte del curso "Herramientas para la ciencia del clima y las emociones climáticas" no te obliga a ser entrevistadx. Si decides ser entrevistadx, puedes negarte a responder a cualquier pregunta o parar en cualquier momento sin ningún tipo de penalización o consecuencia. Puedes retirar tu participación y los datos de la entrevista hasta un mes después de recibir la transcripción (notas) de tu entrevista.

Te haré preguntas sobre tus pensamientos y sentimientos durante las diferentes partes del curso, así como sobre tu percepción de cómo están cambiando tus conocimientos sobre la ciencia climática, y tus pensamientos y sentimientos sobre el agotamiento ("burn out") y las prácticas de autocuidado y de cuidado de la comunidad. Te preguntaré qué cosas te resultan difíciles a la hora de aprender temas relacionados con el clima, qué cosas te resultan difíciles a la hora de hacer activismo climático y qué cosas del curso te resultaron útiles personalmente y como activista climáticx.

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Si estás de acuerdo, grabaré el audio de la entrevista y te entregaré una transcripción para que la revises en caso de que necesite alguna aclaración o ajuste. Tendrás dos semanas para solicitar cualquier edición una vez que recibes las notas, antes de que se utilicen para el análisis de datos.

Riesgos y beneficios: No se conoce ningún riesgo asociado a la participación en el estudio; sin embargo, algunas preguntas podrían causar incomodidad. Si te sientes incómodx durante la entrevista, podemos interrumpirla en cualquier momento. Si esta incomodidad se convierte en un detonante de malestar emocional mayor, puedes recurrir a las siguientes líneas gratuitas de ayuda en salud mental:

UNAM. Ayuda Psicológica a Distancia – 55 5025 0855
Atención en crisis y contención psicológica (República Mexicana) - 800 221 31 09

También puedes solicitarme más recursos para la gestión de las emociones o recomendaciones cerca de ti para la atención de tu salud mental.

Aunque no hay beneficios directos para ti por el simple hecho de participar en esta investigación, esperamos que al comprender el impacto de incluir herramientas para las emociones climáticas en la enseñanza de la ciencia climática para activistas, podamos recomendar formas de mejorar la enseñanza de la ciencia climática y hacer que el activismo climático sea más sostenible y eficaz.

Confidencialidad y almacenamiento de datos: Puedes elegir que se utilice tu nombre o permanecer confidencial, utilizando un seudónimo de tu elección.
Todos los datos de las entrevistas se almacenarán de forma segura en una memoria USB protegida con contraseña dentro de la oficina cerrada del Dr. Paul Berger en la Universidad Lakehead durante un periodo de siete años, a los cuales sólo tendrán acceso los investigadores.

Resultados de la investigación: Los resultados de la investigación serán compartidos en mi tesis de maestría y en una reunión pública en línea con las organizaciones y redes relacionadas con el curso. También podrán publicarse en un artículo de divulgación o en un artículo de revista académica y compartirse en presentaciones en conferencias o congresos.

Información de contacto de la investigadora:

Malinali Castañeda Romero - Educadora e investigadora, estudiante de la Maestría en Educación para el Cambio

Facultad de Educación, Universidad Lakehead

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Profesor asociado

Facultad de Educación, Universidad Lakehead

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Revisión y aprobación del Comité de Ética:

Este estudio ha sido revisado y aprobado por el Comité de Ética de la Investigación de la Universidad Lakehead. Si tienes alguna pregunta relacionada con la ética de esta investigación y deseas hablar con alguien ajeno al equipo de investigación, ponte en contacto con Sue Wright, de la Junta de Ética de la Investigación, llamando al 807-343-8010 ext. 8283 o escribiendo a research@lakeheadu.ca (Se puede solicitar traducción por correo).

Facultad de Educación

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Formulario de consentimiento para posibles participantes

"Evaluando el Papel de las Herramientas para las Emociones Climáticas en el Aprendizaje de las Ciencias Climáticas con Activistas Climáticos Jóvenes e Indígenas de México"

Mi consentimiento

Estoy de acuerdo con lo siguiente:

- ✔ He leido y comprendo la información contenida en la carta informativa
- ✔ Estoy de acuerdo en participar
- ✔ Entiendo los riesgos y beneficios del estudio
- ✔ Comprendo que participo de forma voluntartia y puedo retirarme del estudio en cualquier momento durante y hasta 1 mes después de recibir la transcripción de mi entrevista, así como puedo elegir no responder cualquiera de las preguntas
- ✔ Entiendo que la información recabada será almacenada de forma segura en la oficina del Dr. Paul Berger en la Universidad Lakehead por un period mínimo de 7 años posteriores a la conclusión de este estudio
- ✔ Tengo el derecho a decider si quiero permanecer confidencial o si quiero que en los escritos se use mi nombre
- ✔ Todas mis preguntas fueron respondidas pertinentemente

Al consentir en participar, no renuncio a ningún derecho de recurso legal en caso de daños relacionados con la investigación.

Entrevista # ____

☐ Estoy de acuerdo en que se grabe el audio de mi entrevista **o** ☐ Prefiero que sólo se tomen notas de mi entrevista

☐ Quiero permanecer confidencial en presentaciones y escritos sobre esta investigación **o** ☐ Quiero que se utilice mi nombre en presentaciones y escritos sobre esta investigación

_____ _____

Firma del participante Fecha

Appendix C: Semi-Structured Interview Guide

English version

1. How would you describe your knowledge of climate science before the course? Did it change through the four course meetings? If it did, how did it change?
2. How many emotional, self-care and collective care tools do you consider you had before the course? What do you think of the emotional, self-care and collective care tools that we engaged with during the course?
3. Is it generally easy or difficult for you to learn general science topics or, particularly, science about climate change? Did anything change with this course?
4. Do you find aspects of your activism or your advocacy work difficult? If so, please describe them.
5. Do you ever feel burned out by climate advocacy or activism? If so, please explain what that's like. Do you think that the emotional tools from the course might help you feel differently?
6. Do you think any of the tools you learned in the course will be useful for you as a person, your community, or your activism? Please explain
7. Of the components for climate emotions that we learned in the course, do you have a particular tool or concept in mind that you find most useful or applicable to your life, your community and your activism?
8. Were there climate emotions tools or concepts that you are not likely to find useful, or less likely to find useful, in your contexts?
9. Do you feel that learning climate science and climate emotion tools together helped you in your personal and collective learning and care process as a climate activist? If so, how?

Possible prompts: Did the inclusion of emotional tools help your climate science learning? Did their inclusion help you know how to promote collective or individual mental health care?

10. Did learning climate emotion tools detract in any way from your experience learning climate science?
11. Do you think students of all ages and social justice and climate activists could benefit from learning personal and collective care tools such as the ones you learned in this course?
12. Is there anything else you would like to say about your experience of learning climate emotions tools as part of a climate science learning course for climate activists?

Spanish version

Guía de entrevista semi-estructurada

1. ¿Cómo describirías tu conocimiento en Ciencias climáticas antes del curso? ¿Cambió algo después de las clases? En caso de que sí, ¿Cómo?
2. ¿Qué tantas herramientas emocionales y de cuidado personal y colectivo consideras que tenías antes del curso? ¿Qué piensas de las herramientas emocionales y de cuidado personal y colectivo que vimos en el curso?
3. ¿Generalmente se te facilita o se te dificulta aprender temas de ciencia, en general o, en particular, sobre ciencia climática? ¿Cambió algo con este curso?
4. ¿Consideras que es dificil algún aspecto de tu activismo o tu trabajo de defensa del territorio? Por favor describelo(s)

5. ¿Consideras que te sientes agotado (burn out)? Explica cómo es eso para ti ¿Crees que las herramientas emocionales del curso te pueden ayudar a sentirte diferente?
6. ¿Piensas que las herramientas que aprendiste en el curso te podrán ser útiles para ti como persona, tu comunidad y tu activismo? ¿Cómo?
7. ¿De los componentes para las emociones climáticas que aprendimos en el curso, tienes en mente alguna herramienta o concepto en particular que consideras más útil o aplicable para tu vida, tu comunidad y tu activismo?
8. ¿Hay alguna herramienta para las emociones climáticas o algún concepto de ciencia climática de los que se vieron que no consideres que te será útil o que es poco probable que lo sea en tu contexto?
9. ¿Podrías describirme si consideras que aprender ciencia climática y herramientas para las emociones climáticas a la par te ayudó en tu proceso de aprendizaje y cuidado personal y colectivo como activista climático? ¿Cómo?

   (p.e. Propicia el cuidado de la salud mental en colectivo, individual, ayuda a aprender mejor, etc)
10. ¿El aprendizaje de las herramientas para emociones climáticas te ha perjudicado de alguna manera en tu experiencia de aprendizaje de ciencia climática?
11. ¿Crees que tanto estudiantes de todas las edades, como activistas por la justicia social y climática podrían beneficiarse de aprender herramientas de cuidado personal y colectivo como las que aprendiste en este curso?
12. ¿Hay algo más que quieras decir sobre tu experiencia de aprender herramientas para las emociones climáticas como parte de un curso de aprendizaje de ciencia climática para activistas climáticos?

Appendix D: Research Ethics Board Approval Letter

Research Ethics Board
t: (807) 343-8283
research@lakeheadu.ca

August 15, 2023

Principal Investigator: Dr. R. Paul Berger
Student: Malinali Castañeda Romero
Education
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1

Dear Dr. Paul Berger and Malinali:

Re: Romeo File No: 1469935
Granting Agency: n/a
Agency Reference #: n/a

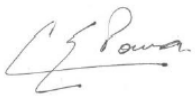
On behalf of the Research Ethics Board, I am pleased to grant ethical approval to your research project titled, "Assessing the Role of Climate Emotion Tools in Climate Science Learning with Youth and Indigenous Climate Activists from Mexico".

Ethics approval is valid until August 15, 2024. Please submit a Request for Renewal to the Office of Research Services via the Romeo Research Portal by July 15, 2024, if your research involving human participants will continue for longer than one year. A Final Report must be submitted promptly upon completion of the project. Access the Romeo Research Portal by logging into myInfo at: https://erpwp.lakeheadu.ca/

During the course of the study, any modifications to the protocol or forms must not be initiated without prior written approval from the REB. You must promptly notify the REB of any adverse events that may occur.

Best wishes for a successful research project.

Sincerely,



Dr. Claudio Pousa
Chair, Research Ethics Board
/sa

Appendix E: Codebook

Name	Description
1. Impacts in their lives or context	**Includes all references made by the participants to the impacts of the emotional tools in their life (personal) or in their context (social, professional, political).**
Applications of emotional tools in their context	Experienced situations or examples of possible situations in which participants use the emotional tools they learned in the course, in their daily lives, in their learning processes or in their activism.
Contributions to community building	Participants' insights on course planning and execution, community-based research and reciprocity.
Useful elements of the emotional tools	Elements from the delivered tools that the participants identified as most beneficial for their contexts
2. Impacts on their learning processes	**Includes all references participants made about the impacts on their overall science or specifically climate science learning process of the emotional tools or the combination of climate science and emotional tools conducted in the course.**
Benefits for students	Examples or opinions provided by the participants of the benefits that this combination could have for students of different ages and levels
Change in the perception of science	Participants' statements about their relationship with or perception of science or science learning after the course.
Sharing of climate science knowledge and concepts learned in the course.	Participants' remarks about already experienced or future projections of sharing knowledge and concepts of climate science learned in the course with their groups, networks, families, and organizations.
After-course knowledge of climate science	Participants' perceptions regarding acquired knowledge during the course
Previous climate science knowledge	Participants' reported level and descriptions of their climate science knowledge before the course.
Experience with the climate science course	Participants' perceptions and opinions of the course regarding their climate science learning.
Experience with the combination of climate science and emotional tools	Participants' opinions and perceptions of their experience with the combination of emotional tools and climate science learning.
Previous science learning experiences	Past experiences or perceptions of participants' science learning skills

3. Impacts on their activism	**Includes all references participants report on the impacts of the emotional tools or the course as a whole on their activism, including experiences before, during and after taking the course.**
Addressing burnout	Experiences or future projections of possible applications of the emotional tools of the course to counteract burnout.
Activism related experiences	Participants' positive and negative experiences in their activism
Burnout experiences	Participants' recall of past or present burnout experiences.
4. Impacts on their mental health	**Includes all references participants made about the impacts of the emotional tools learned in the course on their mental and emotional health, their connection to their own emotions and their experiences before, during and after the course.**
Experience with the emotional tools in the course	Participants' opinions and perceptions of their experience referring only to the emotional tools during the course.
Management of emotional tools or safe spaces for emotions	Participants' remarks regarding the different people or institutions who should or should not be in charge of creating spaces or handling emotional tools.
Previous knowledge or practice of emotional tools	Emotional tools participants had or knew about before starting the course
Opinion of the emotional tools	Participants' judgment of value attributed to the emotional tools presented in the course.
Reconnecting with emotions	Experiences of reconnecting with their own emotional side during or after the course.
5. Other findings	**Includes all references to information that may be relevant to consider in this or future research, which are not directly related to the research questions of this thesis.**
Non-useful elements for their context	Elements from the delivered emotional tools or climate science concepts that the participants identified as not useful for their contexts
Cultural context of emotions	Participants' remarks on their cultural perception of emotional display and emotions sharing
Previous experiences with listening circles	Notes on previous experiences of course participants with listening circles facilitated by Malinali in the past (2021 and 2022)
Importance of knowing the course educator	Participants' reflections on the role of the previously existing relationship with the educator in their learning and the trust built in the course.
Importance of knowing the other group members	Participants' opinions regarding the role of having known or not known the other participants before the course.
Reflexions on the course planning process and course feedback	Comments from participants on the course planning process, the invitation to participate in the research, and any feedback from the course.