



Revolutionising sustainability leadership and education: addressing the human dimension to support flourishing, culture and system transformation

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Abstract

Research shows that today's societal crises are rooted in a lack of connection to ourselves, others and nature. At the same time, there is an increasing body of knowledge showing that humans possess innate capacities for connection that can be strengthened through certain methods, and throughout our lifetimes. Such methods have, so far, however, been rarely applied, or adapted to the context of sustainability leadership and education. Critical qualitative analyses and empirical evidence that would help to understand if, and how, related interventions can support sustainability outcomes across scales are vastly lacking. The present study addresses this gap. It examines global leadership programs that aim to nourish inner development and accelerate work towards the Sustainable Development Goals. More specifically, it systematises the qualitative impacts and learnings from a Climate Leadership Program for policy and decision-makers (e.g. the European Commission) that provided the basis for co-developing similar programs for the United Nations Development Program, the Inner Development Goals Initiative, and the Inner Green Deal. The findings demonstrate how sustainability leadership and education can become a vehicle for transformation, if certain principles are in place. They highlight the importance of addressing the ontological, epistemological and praxis dimensions of inner-outer transformation to empower participants to challenge unsustainable social paradigms and enable them to systematically mainstream the consideration of inner potential and capacities into existing cultures, mechanisms and structures. Our findings advance knowledge on the complex intersection between sustainability, inner development and transformation, and set a precedent that other training institutions could follow or learn from.

Keywords Behaviour change · Climate anxiety · Change climate · Climate policy · Climate policy integration · Compassion · Inner transformation · Inner transition · MBSR · MBCT · Mindfulness · Nature connection · Paradigms · Worldviews

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1 Introduction

Emergent research shows that today's societal crises are, fundamentally, relationship crises. They are rooted in a lack of conscious connection to ourselves, others, and the world we share. They stem from modern societies' individual and collective mindsets of disconnection that drive increasing mental ill-health, social alienation and exploitative behaviours, and inhibit sustainability responses at all levels (individual, collective and system) (Figueres and Rivett-Carnac 2020; Ives et al. 2020, 2023; Scott et al. 2021; Wamsler et al. 2021; Woiwode et al. 2021; Bentz et al. 2022; Wamsler and Bristow 2022).

At the same time, there is increasing scientific evidence that shows that humans possess the innate capacity for deep conscious connection, and that it can be restored or strengthened through certain methods, and throughout our lifetime (Kegan and Lahey 2009; Hunecke 2018; Scott et al. 2021; Waldinger and Schulz 2023). Mindfulness-informed methods have been particularly highlighted in this context, as a way to support a more relational paradigm, and its potential role for sustainability has consequently received increasing attention (Thiermann and Sheate 2021; Bristow et al. 2022; Wamsler et al. 2021). Related methods have so far, however, been rarely applied or adapted to the context of sustainability leadership and education (Liao 2022).

Against this background, this research paper addresses the important topic of the potential of leadership and capacity building programs to support sustainability transformation. It particularly focuses on programs that aim to nourish inner development to accelerate change. As there are a growing number of such programs being offered to diverse audiences in and outside academia, it is high time to critically evaluate their potential (Woiwode 2020; Wamsler et al. 2021; Liao 2022).¹ The present study addresses this gap.

Based on an exploratory, reflexive case study, we investigate if, and how, related interventions (can best) support participants' inner development and sustainability outcomes across individual, collective and system levels.

The outcomes offer insights into the process and possibilities of adapting methods for inner development, and fostering (re)connection through sustainability leadership education. First, we present the background and our methodology, then our results, before we discuss some key learnings and principles for future endeavours, which other training institutions could follow or learn from.

2 Methodology

Our article presents an exploratory, reflexive case study (Burns 2007; cf. Glassman and Erdem 2014) to critically assess the development of global leadership programs, designed to nourish inner development and associated transformative capacities, to accelerate work towards the Sustainable Development Goals (SDGs). More specifically, it systematises qualitative impacts and learnings from an international Climate Leadership Program (CLP), which provided the basis for co-developing three subsequent programs: the first Global Leadership for Sustainable Development Program of the Inner Development Goals (IDGs) Initiative; the first Conscious Food Systems Leadership Program of the United Nations Development Program (UNDP) and its Conscious Food Systems Alliance

¹ In particular, qualitative analyses and empirical evidence are vastly lacking.

(CoFSA); and the Mindfulness-Based Sustainable Transformation (MBST) and associated train-the-trainer programs of The Inner Green Deal. The development process included the following steps:

- Design and experimentation of the CLP through combining mindfulness-informed methods with other tools, and adapting them to the context of sustainability (for details see Suppl. Information 1).
- Assessment and validation of the resultant inner-outer transformation processes and associated methods (presented in Section 3).
- Conceptualisation of learnings and a comparison with subsequent programs for creating guiding principles and train-the-trainer models that can shape similar endeavours (presented in Section 4).

The CLP comprised seven online modules, supported by a social learning platform and a mobile app. It combined insights from neuroscience, sustainability and behavioural science to systematically support inner, transformative qualities and capacities. Subsequent programs were very similar, and differences mainly relate to tailoring to target audiences. Participants in the CLP consisted of 94 policy and decision-makers working in the field of sustainability, mainly for the European Parliament, the European Commission and multinational companies. Recruitment involved announcements via social media and the internal communication channels of these institutions. For an overview of the program, associated methods and subsequent initiatives, see Suppl. Information 1.

Based on inner-outer transformation theory² (Wamsler et al. 2021, Ives et al. 2023), we collected qualitative data from: *i*) surveys; *ii*) participatory observation; and *iii*) group discussions, to examine participants' development and perceptions regarding: *i*) *changes in how they relate* (to self, others, work, nature and the world at large); *ii*) *changes in how they engage* in different settings (private life, the wider societal context, work, nature and the world at large); and *iii*) *the relevance of different methods* for such change across personal, collective and system levels (see Suppl. Information 2 and 3). The results offer insights into participants' development, perspectives and actions, and shed light on the importance and possibilities of adapting methods for inner development to support flourishing, culture and system transformation.

Surveys consisted of pre- and post-course questionnaires that were conducted on the first and last day of the program, as well as additional surveys after each module (see Suppl. Information 4). A thematic analysis was used to explore the survey data in relation to the research aims (Braun and Clarke 2006; Corbin and Strauss 2008; Nowell et al. 2017).³

² Inner-outer transformation refers to a profound shift in perspectives towards a more relational paradigm, by emphasising, expanding and strengthening interdependencies and connectedness between ourselves, others and the world we share, and cultivating inner qualities and capacities that support a deeply caring and compassionate quality of such relationships (Artmann 2023; CCCE; 2019; Ives et al. 2023; Walsh et al. 2021; Wamsler et al. 2021, 2022). Accordingly, the inner-outer transformation model suggests that changes in how people relate to themselves, others and the world at large provide good indicators of inner-outer transformation and associated action-taking for sustainability (see Suppl. Information 2).

³ In accordance with the research aims, the study did not seek to provide a representative picture of any quantitative or statistical differences (cf. Ramstetter et al. 2023), but to explore potential changes, and the perceived linkages of such changes to certain methods in a selected, non-representative sample of experts from different fields and sectors. Data were thus gathered from the most information-rich sources available, in order to gain a picture that was as complete and nuanced as possible (in a qualitative sense). To increase reliability and validity, the first and second authors of this article assessed participants' development and perceptions independently to validate the analyses, associated themes and patterns (researcher triangula-

The analysis involved the following steps: (1) familiarisation with the data; (2) generating initial ideas and themes through open coding; (3) interpreting and systematically categorising the content into themes and associated patterns; (4) reviewing; and (5) further defining through axial and selective coding. Data were coded and analysed until saturation was reached (i.e. when the coding categories that had been discarded were confirmed, and no more significant or relevant themes or patterns could be identified). In addition to thematic coding, inner-outer transformation frameworks were applied in order to cluster transformative qualities (i.e. the inner capacities that participants developed and reported as essential for addressing sustainability-related issues) (IDG Initiative 2021; Wamsler et al. 2021).

Analyses of participatory observation during the course's modules, and written group discussions on its online platform aimed to challenge, complement or nuance the identified patterns. Here, we first identified instances wherein participants reflected on the course's methods, related changes, and the sustainability projects they were asked to develop (see Suppl. Information 1), prior to a thematic analysis. In addition, climate mainstreaming frameworks were applied to assess the nature and relevance of the developed project measures for sustainability transformation (Wamsler and Osberg 2022).

3 Results

In the following, we present the influence of the CLP on how participants *relate* (Section 3.1) and *engage* (Section 3.2) in sustainability, before we discuss the relevance of different *methods*, associated transformative capacities and context in this regard (Section 3.3).⁴ Since this study focuses on professional leadership development, we first present outcomes regarding participants' work contexts, before we describe changes regarding the other levels of analyses (see Suppl. Information 3).

3.1 Inner change—changes in relationships

3.1.1 Relation to work

Our results show that the CLP influenced how participants relate to their work. Patterns towards a more relational paradigm could be seen in the following types of changes:

- Change in motivation for working on sustainability-related issues.
- Change in perceptions regarding which inner capacities are essential for addressing sustainability and associated systems transformation.
- Change in understanding and reflexivity regarding one's own values, capacities and needs to influence transformative change in the work context.
- Change in how participants want to relate to colleagues and cooperation partners.

Footnote 3 (continued)

tion). Based on the different data sources (data triangulation), the analysis focused on identifying themes and patterns of change across all participants. In addition, to verify the outcomes the analysis was supplemented by looking into changes in individuals (methods triangulation).

⁴ The illustrative verbatim that are included in the following subsections are anonymised to protect the privacy of participants.

The analysis of pre- and post-survey data shows a clear shift from a more extrinsic, instrumental or individualistic motivation, or ideas of wanting to change others, towards a more intrinsic, relational and embodied motivation. In their pre-survey responses, participants express their motivation mainly through negative emotions, such as anxiety regarding perceived, existential threats or concerns for close ones. In their post-survey responses, many participants continued to acknowledge their worries. However, at the same time many also express positive feelings as a source of motivation for working on sustainability-related issues: hope, love, and courage, and newly-gained perspectives of one's work as a personal source of nourishment or meaning, an opportunity to work collaboratively to support change, or even a calling or service that had become more embodied. For some, this also involves a newly-felt desire to 'integrate climate work in all parts of life', and move from a perceived separation between work and private life to a 'non-dualist work-private life'.

In addition, several answers indicate a clear change towards widening circles of identity, responsibility, care and connection as a source of motivation, for example, by expanding the focus from kin to 'future families'. Even in cases where participants' motivation, noted in their pre-survey responses, is quite elaborate regarding their feelings of responsibility (e.g. handing this world over to our children as we found it, or better), post-survey descriptions are even more elaborate. The latter refers to subtle changes or shifts in understanding, expressing interdependencies and relationality, or accentuating important facets of inner-outer transformation (e.g. ethical issues of climate change and sustainability, linking 'quality of life', 'justice and equality').

In some cases, participants explicitly record, in their post-survey response, that their motivation for sustainability-related work has changed, although they were not asked about any changes in this regard. Some explicitly state, for instance, that they gained a more profound understanding of the role (and agency) of individuals in system change, in other words, that individuals and their inner capacities matter—as opposed to the understanding that climate action is only a governmental task or responsibility. One participant explains their motivation as the possibility to 'contribute as an individual to systemic change', stating: 'In the program I learned that even small contributions matter. Now I feel less helpless and more motivated'.

Overall, the described changes in participants' motivation relate, amongst others, to the following transformative qualities/capacities: an increased awareness of one's emotions; the nourishment of intrinsic value orientation; and positive emotions such as a sense of connection and compassion (including for 'animals, nature, and the planet as a whole'), hope, courage and agency.

Apart from the described changes in motivation, our analyses also identify a change in participants' perceptions regarding the relevance of inner qualities/capacities for sustainability. Some even explicitly express that what they considered as relevant changed during the course, although the survey did not ask about such reflections. The identified changes involve a shift from a recognition of particular professional skills (i.e. hard skills regarding job-specific duties) and individually-focused inner capacities (e.g. inner resilience to deal with one's own overwhelm or anxiety), to more intrinsic and relational capacities, and their interconnection. Examples are the increased importance given to compassion towards others, the latter's interlinkages with perspective-taking, courage, agency, and an increased openness for the emergence and recognition of everybody's potential, which supports better-integration of knowledge and co-creation ('letting go of having to be right and letting new possibilities emerge, understanding the world from new/other perspectives').

The third identified pattern relates to changes in perceptions regarding the participant's *own* values, capacities and need to be able to influence change in the work context. Related

examples are illustrated by the increased reflexivity of one's intrinsic values that, in turn, can help to better-prioritise different work tasks (see also Section 3.2.1), and seeing the need to challenge unsustainable paradigms. As expressed by one participant, changes in the work context involve 'reflecting a lot about our corporate culture and my impact, my role, within it'.

The fourth identified pattern concerns participants' relations to colleagues and cooperation partners. It involves an increased sense of connection and compassion. This has, for some, translates into an increased awareness of the importance of collaboration and nurturing quality relationships to support sustainability, and, thus, increased openness, courage and trust in others and collaborative work processes (see also Section 3.2.1).

Together, the identified patterns have resulted, for many, in an increased willingness to engage in sustainability aspects at work, expressed in statements such as: 'I want to push the topic (sustainability) now more in my department', or 'I am [now] more determined to act'.

3.1.2 Relation to nature and the world at large

Our results also show changes in how participants relate to nature. The following types of changes and patterns towards a more relational paradigm were identified:

- Change in understanding one's own impact on nature.
- Change in abilities to feel connected to nature.
- Change in reflexivity and perceptions regarding one's relation with nature and associated interdependencies.

Changes concerning participants relation to nature were most dominant. Around half of the coded changes are related to this aspect. Participants' answers feature a clear shift in understanding the human-nature connection: from a general understanding of humans' impact on the natural environment and seeing nature as external, towards a deeper awareness of one's own carbon footprint and feelings of connection and interdependency.

Participants also note changes in their abilities to feel connected to nature, stating that 'the connection became deeper', and involved 'becoming more aware of the inner connection between things, people, and nature'. For many, this resulted in an increased sense of wonder and awe regarding nature that was expressed in diverse experiences with, and descriptions of animals and plants.

The identified change towards a more relational understanding of nature can also be seen in a change in participants' wording, 'seeing nature as [a] living being' (as opposed to an object to be exploited) and 'the more than human world'. Change towards a more relational understanding is often also linked to participants' reflections about their role, identity and purpose in life. Accordingly, one participant states that 'The whole course, it makes me reflect more and think more about what is really important in life.'

3.1.3 Relation to others

Similar to the aspects that have been highlighted in the context of participants' changes in relation to their colleagues and cooperation partners in the work context (cf. Section 3.1.1), changes in how participants relate to others in their wider social context include the following patterns:

- Change in their sense of connection, community and shared humanity.
- Change in awareness of the importance of connecting and cooperating with others, and supporting quality relationships for sustainability.
- Change in interest in developing capacities that can support such relationships.

Around one fourth of the total reported changes concern how participants relate to others. They centre around people's increased sense of connection and community, and an associated increased sense of our shared humanity. The latter relate to an increased understanding of people's shared fears, aspirations and intrinsic, universal values.

Consequently, participants' answers also show an increased awareness and importance given to nurturing quality relationships to support sustainability and, in turn, more interest in developing capacities that can support such relationships, notably: compassion, openness, perspective-taking, trust, listening and communicating at a human level, exposing one's vulnerability, feelings and emotions.

Overall, compassion is mentioned in almost all answers. In total, the word compassion is mentioned 108 times in pre- and post-module surveys.

3.1.4 Relation to self

The CLP also influenced how participants relate to themselves. Patterns towards a more relational paradigm can be seen in the following types of changes:

- Change in self-awareness (thoughts, feelings, body sensations).
- Change in self-compassion.
- Change in self-identification.

Around one third of participants report changes in how they relate to themselves. They mainly concern an increased awareness regarding their thoughts, feelings and body sensations.

In addition, several note a shift in self-compassion, whilst at the same time feeling less egocentric or self-centred through a shift in self-identity (seeing and feeling community and interdependencies, cf. Section 3.1.3).

3.2 Outer change—change in engagement and behaviour

3.2.1 Engagement at work

The CLP influenced how participants engage at work. Patterns towards a more relational paradigm and more integrative approaches can be seen in the following changes:

- Change in foci and priorities of sustainability-related work.
- Change in cooperation and communication for sustainability.
- Change in sustainability-related strategies and measures (i.e. the integration of inner and outer dimensions of sustainability).

Most changes in this category relate to a change in work focus, making sustainability a priority. Many participants decided to 'push the topic (sustainability) more' within their current working structures (departments or units) and make it a priority within their current

work. As one participant describes: ‘Now, with every new project, I ask myself how this contributes to sustainability. And I turn down assignments that don’t directly contribute to it.’ Similarly, another states: ‘When I allocate my time at work, I now always ask myself to what extent this activity contributes to my sustainability goals, and I prioritise accordingly’. Another participant notes that the course led to ‘a clear decision about the rest of my career. I talked to my supervisor about wanting to spend more time to directly contribute to sustainability. (...) I decided to dedicate all of my working time in 2022 to a sustainability initiative.’ One participant even changed their job, to accommodate a greater focus on sustainability-related issues.

The second-most-common change regarding participants’ engagement at work relates to collaboration; that is, how they collaborate with others to support sustainability. This involves changes in both quantity and quality. On the one hand, participants report that they now collaborate with more actors across different sectors, and push for more collaborative projects and networks to support change. On the other hand, they also report that the way they collaborate has changed, particularly regarding how they listen and communicate. The latter relates to both content and approach. Participants note, for instance, that they ‘try to focus on emotions and less on statistics now’, and are ‘speaking up more in meetings’. Others describe how they are now ‘able to stay calm when faced with difficult situations’.

Finally, changes in understanding relationships and interdependencies between inner and outer aspects of sustainability (cf. Section 3.1) helped participants to see new entry points and gaps for change that need to be addressed through more integrative approaches. Some identified, for instance, ‘health as a linking factor’ and entry point for integrating inner dimensions into typical, externally-focused approaches and initiated related inter-sectoral work.

The increased understanding, and support for more integrative approaches can also be seen in participants’ proposed breakthrough project. During the final modules of the CLP, participants were encouraged to explore their ‘calling’, and collaborate with others to develop new projects (see Table 1a in Suppl. Information). Our analysis shows that all 18 projects involved inner and outer aspects of change, whilst their entry points and foci varied: four times at system level, five times at organisational level, one time at collective level, and eight times at individual level, with an emphasis on communication and capacity development. Several of these projects have been implemented. One example is the decision of two participants to work together and launch a leadership program for sustainable development that builds on the CLP (The Global Leadership for Sustainable Development Program, funded and launched as part of the IDG Initiative). Another example is a group of EU staff who decided to continue to meet regularly after the program to explore how to integrate the human dimension in their environmental work. One direct outcome of this was a high-level panel discussion during the EU Green Week on the human dimension of the Green Deal, with interventions from the EU, UNESCO, the Club of Rome and the Inner Green Deal.⁵

However, participants’ increased interest in engaging with a different approach, and their efforts to apply their learnings to their work context also shed light on related challenges. The difficulty of integrating a different language, for example, compassion, into a professional work setting was pointed out. And for many, it is unclear how inner development could be systematically addressed and embedded in their working context, beyond

⁵ These findings also show that true internalisation (digesting and making something your own) takes time. Compared to the previously- described changes in engagement, the examples listed in this paragraph took over a year to materialise.

changes in offered capacity development and communication. Broader policy measures at system levels are vastly lacking.

3.2.2 Engagement with nature and the world at large

The CLP influenced changes in how participants engage with nature, and the world at large. Patterns towards more relational paradigms and approaches can be seen in the following types of changes:

- Change in the duration and quality of time spent in nature.
- Change in the level of engagement for reducing harm and caring for nature.
- Change in communicating human-nature relations.

Most participants report spending more time in nature, and being more present in, and with, nature. The associated effects on overall wellbeing are noted and appreciated by many. Several participants note, in the post-course survey, an 'increased necessity to go for a walk now and then' and take the time to be in nature 'even if work is pressing'. Some even portray the CLP as a welcome 'excuse' to be in nature, which is needed in a production-focused culture.

The second-most-common change relates to new actions to reduce harm and care for nature. Examples include using a bike for transportation, both to be in nature and to harm less, collecting garbage in public green spaces, organising green area cleaning, eating local and organic products, and reducing meat consumption to support biodiversity and other sustainability benefits. Finally, participants started to communicate about the role of nature, and human-nature relations with others (cf. Section 3.1.2).

3.2.3 Engagement with others

Changes towards a more relational paradigm and approaches can also be seen in how participants engage with others. They include the following patterns:

- Change in listening and communicating.
- Change in social engagement for sustainability.
- Change in attention to one's own boundaries to sustain social engagement.

Participants report many changes in the way they listen to, and communicate with others. They describe themselves as being more present, more open to other perspectives, and more compassionate, leading to less aggressive, less judgemental, and more authentic encounters with others. Many describe that they 'communicate in a more compassionate way' and allow one's own vulnerabilities, feelings and sensations to become part of communicating and connecting with people. One person describes, for instance, that the course had influenced his decision to apologise to a neighbour for his behaviour during a quarrel.

Regarding sustainability, several note that they now speak up and 'relate more with others', while at the same time they pay more attention to their own boundaries to sustain engagement. Some have started to engage in new social activities, such as organising collective information and cleaning days. In this context, one participant points out that: 'Most of all the course has made me much more aware of the value of how my own awareness of

my body, my emotions etc. contributes to my effectiveness in reaching out to others in communication, in collaboration and in advocacy.'

Some also report how their increased social engagement has not only augmented their motivation to act, but also positively influenced other parts of their life, such as the fact that 'helping others increases happiness'.

Compared to the abovementioned activities regarding work, nature and people's closer circles of care, activities in the wider social context are rather limited (totalling only 10% of explicitly mentioned inner-outer changes).

3.2.4 Engagement in private life

Changes in how participants engage in their private life, with their close family and friends, include the following patterns:

- Change in personal time and activities dedicated to sustainability (consumption, food, mobility, energy and water use).
- Change in listening and communicating in support of sustainability.
- Change in seeking self-care and a better life balance.

Around one third of the mentioned behaviour changes relate to the private life of participants. Examples are both numerous and diverse, small and large scale, and relate to aspects of consumption, food, mobility, energy and water use: abandonment of plastic bottles, reducing packaging, reconsidering purchase decisions, eating less meat or more vegan food, using a bike for transportation, becoming more self-sufficient through, for example, growing one's own food, reducing food waste, water or energy use, installing solar panels or water-saving valves, changing energy provider, changing to an electric car, considering sustainability aspects when looking for a new house, and increasing financial investment in renewable energy in one's own and other (particularly vulnerable) countries. As expressed by one participant: 'I'm even more aware of my own impact and try to reduce my footprint'.

In line with previous analyses (see Sections 3.1 and 3.2), changes in listening and communicating also feature in the context of participants' private lives. Interestingly, the given examples not only relate to how to better-listen and communicate (e.g. with more patience with children), but also what is communicated. One person mentions, for instance, how she now actively integrates environmental aspects in stories when playing with children, whilst others mention that they now talk more with loved ones about their own sustainability activities and engagement.

The final pattern relates to self-care: participants actively take more time for contemplation, and take care of themselves in support of the bigger whole. As expressed by one participant: 'I am discovering a new balance in my life, a deep connection to my inner wisdom'. Examples of self-care are taking time to reflect, taking walks or runs outside, noticing sounds and smells, and making more time to become one with nature.

3.3 Inner-outer change—practices and other factors

3.3.1 Transformational practices

Our analyses also provide input regarding the applied methods for supporting changes across personal, collective and system levels. Overall, the following patterns can be identified:

- Change in perceptions, relationships and engagement is supported by the offered methods, whilst indicating clear individual differences and preferences.
- Change in perceptions, relationships and engagement does not relate to a single, but a mixture of offered methods, other learning activities and conditions.
- Mindfulness-informed methods that are adapted and linked to compassion, gratitude and nature contemplation are particularly valued.
- These methods are said to be particularly relevant for expanding one's sense of awareness, connection and care, and because they offer time and space for relaxation and contemplation, which, together with other activities, play a key role in the learning process.

All participants report that the recorded changes in perceptions, relationships and engagement (presented in Sections 3.1 and 3.2) are supported by the course in different ways. Literally all of the methods and other types of learning activities are mentioned by someone in this context. As described by one participant: 'Each session led to the emergence of many insights and strengthened these [session-specific] capacities, as well as my resilience and collaboration!'

At the same time, the responses clearly show individual differences, preferences and challenges in relation to all types of methods. Accordingly, participants note that the changes they report are due to different mixtures of offered practices and other learning activities. One participant highlights, for instance, the importance of combining 'meditation and educational input on [the online learning] platform' for increasing awareness, and openness with 'talking to the other [course] members' for increasing perspective-taking, whilst others note other preferences.

At the same time, certain methods are mentioned more than others. They are mainly mindfulness-informed approaches that have been adapted to the context of sustainability, to contemplate one's identity and relationship to self, others and the world at large, and develop a caring and compassionate quality of such relationships.⁶ Integrative gratitude, compassion and nature walks were concrete examples.

⁶ Mindfulness is an innate capacity that enables people to pay attention intentionally to inner and outer present-moment experience, with an attitude of openness, allowing, curiosity and care. Compassion is an innate capacity and motivational system that involves the willingness and ability to alleviate suffering with tenderness and care (involving self-compassion, emotional regulation, a feeling of a shared, common humanity, human-nature connectedness and associated action-taking) (Gilbert 2017). Both support increasing circles of identity, care and responsibility (Wamsler et al. 2021). A typical mindfulness course includes weekly sessions over 6–12 weeks and increasingly involves aspects of compassion training. Evidence-based mindfulness courses have evolved over more than 40 years in modern cultures and tend to use MBSR curriculum as a key reference point. Compassion-based training is a newer area of innovation, without an obvious original curriculum for the field to cohere around (Bristow et al. 2022; Strauss et al. 2016).

In this context, the importance of compassion is highly appreciated by most. Compassion practices are often perceived as being intrinsically linked to participants' feelings of nature connection, experiencing interdependency, and seeing the urgency to act and protect the environment. As stated by one participant, 'during the compassion meditation [when it was said] now imagine all wild animals in their natural habitat, I became aware that I am also one of these animals, just like them'. Similarly, mindful nature walks are said to support connection and seeing interdependencies, as well as overall calmness. Their relevance is noted by many, including those who had already engaged in contemplative practices for a long time. Self-compassion practices are highlighted as being helpful in understanding that 'emotions are good friends and help us' to deal, for instance, with climate anxiety (as opposed to something negative to oppress). Together, these practices are said to be particularly relevant for expanding one's sense of awareness, connection and care, and because they offer time and space for relaxation and contemplation, which, together with other activities, play a key role in the learning process. In addition, they have been adapted to, and complement, other reflection and perspective-taking exercises that help participants to deepen related insights, and break out of either-or-thinking and dualism. As a result, one participant highlights as an important insight that 'there is not only black or white, but also grey'.

Finally, journaling is discussed as a useful way to process, structure and remember insights from the different methods and learning activities. Journaling is particularly valued by those who apply the different methods regularly: 'I found that journaling made me notice the way I talk to myself (...). I actually thought about stopping journaling because I thought that it just makes me feel worse. However, with time, I learned to change the way I talk to myself, because I could see those words on paper. So instead of being judgemental or self-critical towards myself, I learned to write more affirmations, or just state how I feel, or what I do, without judgement. Now journaling is something I look forward to in the morning, I look forward to speaking to myself nicely'. Several participants note the importance of regular practice to support transformative change, together with the relevance of contextual factors (see Sections 3.3.2).

3.3.2 Contextual factors

Apart from specific methods, participants highlight certain contextual factors that influence changes in perceptions, relationships and engagement. The following patterns can be identified:

- Safe learning spaces are a precondition for engaging in new methods, fostering transformative capacities and supporting change.
- Regular practice, i.e. engagement with, and repetition of transformative methods during and outside the class is crucial to sustain change.
- Individual preferences and levels of experience influence participants' learning and associated change.
- Current cultures, institutional mechanisms and structures make it harder for participants to see how they can translate their learning into concrete measures and strategies at collective and system levels.

Many participants highlight that the learning space provided by the program is key. It is seen as a safe container that allows them to engage in new methods, supports

associated reflections, and, ultimately, nourishes awareness, insights, connection, purpose and agency. Many participants appreciate the opportunity to have a safe space to think and feel more deeply, a space that was consciously created through setting up certain rules (e.g. confidentiality, deep listening) and different types of interaction—dyads, group discussions and sharing forums—for refining and deepening insights. Group discussions and breakout groups are also said to help increase motivation and endurance, for example, to maintain home practices despite the challenges.

Regular engagement with, and repetition of home and in-class practice is said to be crucial to sustain change. ‘When I do the practices, they certainly make a difference’. This not only relates to their application at individual level, but also at organisational, collective and system levels. A focus on inner development at the individual level, without linking it to methods to consider and integrate it into current mechanisms and structures, can hamper change.

The results also show that individual preferences, and different levels of previous experience influence learning and associated change. The latter relates to participants’ professional experience in the field of sustainability, as well as previous engagement with certain methods. Such differences need to be considered in the way the learning space and methods are set up. Apart from the general challenge of finding 10 or 20 min every day to dedicate to practice, participants who struggle most have not previously engaged in contemplative practices, and thus find most benefits in, for example, more basic mindfulness practices (e.g. breathing space, body scan).

Finally, the link between the offered methods for inner development and the work context is not always clear to participants, both regarding the possibility of translating them into the work context, and their long-term effects. One person (a beginner) notes, for instance, that the effect of certain in-class exercises only lasted for a few hours. Others explicitly reflect on the need for continuous practice to be able to see personal change, and be able to effect changes across all levels. Very few comments explicitly note the relevance of certain methods for the work context and system change. Related questions and discussions continued throughout the course. After in-class practice, one participant states: ‘I liked this experience, I never did it before to that extent. In particular, the part about expanding the senses and connecting with the earth and the sky—that really brought me a lot of space in my mind, intuition, and imagination. Now, my question on this is: how can we link this practice, which seems to be very powerful, to enlarging our perception, for example on climate change issues, (...) looking at this from the inside-out ... (...) How do we make the link? Maybe that’s the million-dollar question?’.

These results show that it is crucial to offer a learning space and methods that integrate inner-outer transformation, avoid inner-outer dualism, and support participants in continuously applying the methods and associated learning to the work context (as opposed to related piloting only at the end of the course). To support change, methods for inner development cannot be separated from learning about sustainability and climate change action. This is particularly relevant in contexts where current cultures, institutional mechanisms and structures make it harder for participants to see how they can translate their learning to concrete measures and strategies at collective and system levels. Consequently, the identified changes in relational being and thinking (perception and relationships) translate into changes in engagement, but mainly at an individual level. Methods that support inner development and transformation (the personal sphere of transformation) thus need to be complemented with knowledge and methods that support participants in applying their learning to the organisational, the collective and the system level.

4 Discussion: key learnings and essentials for accelerating change

Our findings advance knowledge on the complex intersection between sustainability, inner development and transformation, from the individual to the global level. In addition, they provide insights for designing related leadership and education programs to accelerate work towards the SDGs.

The key learnings and associated principles for future endeavours that emerged across the identified levels of analyses, and which are supported by other emergent research, can be summarised as follows: Leadership courses aimed at integrating inner and outer development to accelerate sustainability must support participants in addressing sustainability crises through holistic approaches that link cognitive, social-emotional, ethical and embodied learning. This requires providing: *i*) a comprehensive understanding of the nature of today's sustainability crises in a complex, constantly changing world, and one's role in it; *ii*) a safe space and integrative methods for exploring related inner dimensions and transformative capacities on a continuous basis; and *iii*) practical guidance on how to design and implement measures that link individual, culture and systems change (and address associated power structures); whilst, at the same time *iv*) ensuring quality education through the explicit consideration of ethics, the role of facilitators, and adequate monitoring and evaluation. Together, these four essential pieces, or key ingredients, support individual, collective and planetary flourishing (Fig. 1), by covering all key aspects of inner-outer transformation (ontology, epistemology, praxis, ethics; see Fig. 2d in Suppl. Information and Ives et al. 2023).

4.1 Essential 1: comprehensive understanding of today's polycrisis and our role in it

The results of our study make it clear that participants' starting points and the challenges they encountered during the course are a reflection of modern society's social paradigm (e.g. self-centred individualism, dualist thinking, techno-optimism, overwhelm, exhaustion and stress). Whilst several participants report changes that are, to some extent, challenging this paradigm, many struggle to absorb new ideas about sustainability crises in a complex world, and what this means for supporting transformation and our role in it. Making related aspects more explicit is crucial to accelerate the uptake of participants' learning into their work contexts, which might operate under different norms. This was confirmed in follow-up programs, where these aspects were not addressed, and participants explicitly asked for clarity regarding the theoretical foundations of inner-outer transformation (Rupprecht and Wamsler 2023).

Our assumptions about the nature of reality shape how problems are defined and understood, and the mental models or theories of how change comes about. They influence how we understand our own agency to support change, and how and why each of us matter in responding to global crises. Providing related information is thus crucial. It requires understanding the following key aspects that relate to the ontological dimension of inner-outer transformation for sustainability (see Ives et al. 2023):

- An understanding of the nature of today's societal crises;
- The nature of the complex systems involved; and
- The associated mind-sustainability nexus.

The resultant theory of change (latent human potential, interdependence of inner/outer and individual/collective/system phenomena) is contrary to current mainstream thinking

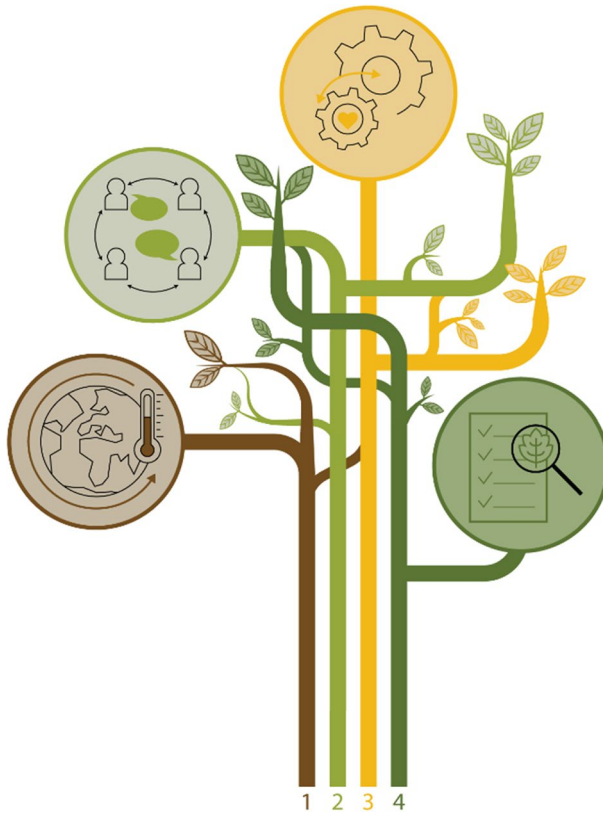


Fig. 1 The leadership education tree, indicating the four essential pieces or key ingredients for holistic learning and understanding to accelerate sustainability transformation. They involve: 1) how we see the world, 2) how we get to know, 3) how we engage, and 4) how we ensure quality and equity considerations across all aspects. Together, they support flourishing across scales—by covering all key contributions of inner-outer transformation (cf. Ives et al. 2023)

(outlined in the Introduction). In fact, there is mounting evidence that today's societal crises have one common denominator, or root cause: they are a reflection of an inner, human crisis of disconnection or separation from self, others and nature, which is grounded in modern societies' social paradigm (see Introduction). This paradigm is based on the understanding that our thinking mind is separate from our feelings and bodily emotions, that we are all separate from each other, that some humans are superior to others, and that we humans are separate and superior to the rest of the natural world (ibid). Addressing sustainability crises thus requires a shift away from these exploitative to more relational and regenerative paradigms.

This change involves engaging in complex systems, both individually and collectively (see the second point listed above). Engaging in complex systems is, however, challenging, because they are fundamentally different from machines (thus questioning our modern, mechanistic worldview). Complexity research indicates that they undergo a self-organization process that ultimately shapes the state they are in, and which emerges from relationship patterns within the system (Slingo et al. 2008). Consequently, and in accordance with the above- described understanding of today's metacrisis, system transformation is about

changing relationship patterns, and requires addressing human, inner dimensions that influence these relationships.

Addressing such dimensions requires, in turn, an in-depth understanding of the mind-sustainability nexus (the third aspect listed above).⁷ Related research shows that this nexus is fourfold, with the mind currently being: *i*) a root cause or driver of today's crises (see the first point above); *ii*) a victim of these crises (e.g. seen in increasing levels of ecoanxiety); and *iii*) a barrier for adequate action (e.g. due to cognitive biases and a related increase in polarisation); together resulting in *iv*) a vicious cycle of deteriorating individual, societal and planetary wellbeing (Wamsler and Bristow 2022; see Fig. 2e in Suppl. Information). At the same time, research also reports that humans possess the innate capacity for deep conscious connection (Kegan and Lahey 2009; Hunecke 2018; Scott et al. 2021), which can help to reverse this vicious cycle, and start a virtuous cycle that supports flourishing across all scales.

Taken together, the described aspects provide an understanding of how and why each of us matter in responding to today's polycrisis, moving from an understanding of people being 'agents to be changed' to being 'change agents'. They also show that tapping into this potential is about supporting human capacities and conditions for (re)connection. Such capacities are called transformative capacities, or inner development goals, and they have been systematised in emergent research under five broad clusters (IDG Initiative 2021, 2022; Wamsler et al. 2021; see Essential 2).

4.2 Essential 2: integrative methods for exploring inner dimensions and nurturing transformative capacities

The understanding presented under Essential 1 means that change cannot be approached using the same mindsets and conceptions of knowledge that underpin it. It necessitates a different approach to epistemology, i.e. the inclusion of different kinds of knowledges, different approaches to knowledge development, how we come to know, and weaving together diverse perspectives. Sustainability leadership and education thus requires the following aspects that relate to the epistemological dimension of inner-outer transformation (see Ives et al. 2023):

- A balanced mix of methods that support holistic learning and (re)connection (through cultivating cognitive, social/relational, emotional, and ethical capacities/qualities), which requires
- The adjustment of methods for inner development to the context of sustainability;
- The consideration of the foundational role of mindfulness- and compassion-based methods; and
- A process that supports repeated, regular and continuous practice (associated fields of change/communities of practise).

Based on a comprehensive understanding of how, and why, each of us matter in responding to societal crises (Principle 1), sustainability education and leadership

⁷ The term 'mind' is used here as an umbrella term to describe our inner lives (i.e. our thoughts, emotions, body sensations and their complex interrelationships), which are, in turn, an expression of our individual and collective values, beliefs, worldviews and associated inner qualities and capacities (cognitive, emotional, relational).

require applying methods that, in combination, can support holistic learning (CCCE 2019) and restore the connection to self, others and nature in an integrative way. Increasing scientific evidence shows that humans possess the innate capacity for deep conscious connection, and that it can be restored or strengthened through certain methods, and throughout our lifetime (Kegan and Lahey 2009; Hunecke 2018; CCC 2019; Scott et al. 2021; Waldinger and Schulz 2023). In the context of sustainability, it involves nourishing all clusters of transformative inner capacities and addressing all facets of the mind-sustainability nexus (see Essential 1 and Suppl. Information: Fig. 2e, Table 2c and Table 2d). Applied in such a way, they can become a vehicle for transformation across individual, collective and system levels. Through restoring conscious connection, they increase not only personal resilience amid adversity, but also our chances of addressing the root causes of today's sustainability crises and mobilising change. Relevant methods include contemplative, psychological, cognitive-behavioural, communication and facilitation techniques (see Suppl. Information 1) and creating safe spaces to allow related engagement and reflections (Mar et al. 2023; Wamsler et al. 2020). In this context, our results also support other studies that indicate the foundational role of mindfulness and compassion practices (CCCE 2019). Tracing the roots of the climate crisis through a culturally entrenched story of separateness (Principle 1), the relevance of mindfulness and compassion becomes obvious, as they can foster fundamental aspects of connection, and thus revert from a vicious to a virtuous cycle of individual, collective and planetary wellbeing (Wamsler and Bristow 2022).

At the same time, our findings show that working on inner and outer dimensions, or on IDGs and SDGs separately misses the point, and highlight the importance of adapting methods for inner development to the context of sustainability. As supported by other research, it should not be assumed that methods for inner development automatically or quickly translate into sustainability advocacy and action on a broader scale (Scott et al. 2021; Wamsler et al. 2021). Against this background, our case study shows how mindfulness-based approaches can be oriented towards sustainability. Similar to the way they have been adapted to the context of stress and depression, in the form of mindfulness-based stress reduction (MBSR) (Grossman et al. 2004; Woods et al. 2021) and mindfulness-based cognitive therapy (MBCT) (Segal et al. 2012), our results provide some guiding principles for mindfulness-based sustainable transformations (MBST). The latter involves linking mindfulness closely to compassion, gratitude, nature-based approaches and reflection practices (such as reflective dyads and group discussions) that proved to be particularly relevant in developing more relational perspectives, beliefs and engagement (cf. Kok and Singer 2017). In addition, it requires building (back) normative mindfulness ethics that were stripped away when the approach was popularised for the Western context, as they are crucial for the context of sustainability and associated intrinsic, universal values (Stanley 2012; Walsh 2016; see Suppl. Information 5).

Finally, our study demonstrates that inner-outer transformation is a continuous process, and thus processes must be in place to help participants to engage regularly and continuously in the offered methods throughout the program and extending to after the program ends. Especially when participants come from different organisations or communities, targeted efforts are required to sustain momentum and follow-up. The establishment of communities of practice and book circles are concrete examples of measures that can help participants to keep their practices and engagement alive (Stuckey and Smith 2004).

4.3 Essential 3: practical guidance on how to design and implement measures that link individual, culture and systems change

The results of our study make it clear that inner-outer transformation is not a purely introspective exercise that is an alternative or separate complement to tangible, practical change. In fact, understanding and experiencing how and why each of us matter, and nourishing transformative capacities through different methods (Essentials 1– 2) has shown to be insufficient to adequately translate participants' learning into concrete measures across levels and scales. They indicate that it requires explicit guidance on how to design and implement integrative approaches that link inner and outer dimensions of sustainability, which is the praxis dimension of inner-outer transformation (Ives et al. 2023). It involves:

- A collaborative action-oriented platform for the continuous application of learning to participants' work contexts;
- Practical knowledge on how the consideration of the human, inner dimension can be systematically mainstreamed across all levels of transformation; and
- The combination of solution-oriented and creative approaches to sustain related engagement.

To avoid an inner-outer dichotomy and dualism, inner work has to go hand-in hand with the continuous application to the work context, not only in the final modules. This was an important result from the CLP and has been increasingly considered in subsequent programs, with participants being asked to reflect on work-related needs, challenges and potentials from the beginning of the course (e.g. Rupprecht and Wamsler 2023).

Translating learning to participants' work contexts requires specific knowledge and skills regarding how to work with others to systematically mainstream/integrate the consideration of sustainability and associated inner dimensions within existing mechanisms and structures. Whilst linking individual, culture and system change are crucial for supporting transformation, integrative approaches rarely featured in participants' reported projects and engagement. Isolated changes in strategic priorities, aims or visions of organisations or teams, working structures, communication, project management approaches, staff development, monitoring, evaluation or human and financial resource allocation is not sufficient.

Finally, methods that can support a move from problem-solving approaches (that focus on responding to problems and what has to be fixed) towards more creative approaches (that focus on tapping into people's inner potential and realising sustainability imaginaries) are, in this context, key to sustaining engagement and transformation (Fritz 1989; Senge 1999, 2006; Sharma 2017).

4.4 Essential 4: quality education through the consideration of differences, ethics, adequate facilitation, monitoring and evaluation

To adequately implement Essentials 1–3, it is crucial to ensure quality and ethics considerations. They involve the following aspects that cut across the ontological, epistemological and praxis dimensions of inner-outer transformation (see Ives et al. 2023):

- The experience of the trainer(s) (relational pedagogies, ethics);
- The consideration of contextual and individual differences, fostering inclusivity and intercultural learning; and

- Adequate program monitoring and evaluation (relational, learner-focused and collaborative alternatives).

Our results support research that indicates that trainers themselves play a key role in the participant's learning (Mezirow 2018). The ability to move beyond traditional, teacher-centric pedagogy towards relational, dialogic, human-centred methods, invite different perspectives, and give a sense of the complexity without overwhelming or confusing participants, is important. Facilitators that lack extensive experience with the offered methods, or an in-depth understanding of today's polycrisis might do more harm than good to individual wellbeing and sustainability agendas. Personal burnout, reinforcing either-or propositions in inner-outer work, or preserving business-as-usual through 'fix-it' and 'fix-others' approaches that reinforce current, unsustainable paradigms are concrete examples (Bentz et al. 2022).

Our results also show that learning is highly personal, multifaceted and contextual. Offering a diversity of methods and entry points for exploring inner-outer transformation is thus crucial, together with continuously improving and decolonising pedagogy to foster inclusivity and intercultural learning.

Finally, our study also highlights that it is challenging to assess and evaluate leadership and education programs that involve both inner and outer transformation, and distil what contributed to the success of a program. It indicates that current monitoring and evaluation approaches must be adjusted to take account of a more comprehensive understanding of today's sustainability crises and the associated theories of change (see Essential 1). The presented approach proved to be valuable to shed light on the complexities at play. Changes in relationships are shown, in this study, to be a good proxy for inner-outer transformation and action-taking.

Evaluation approaches need to assess what must be changed. Following the presented essentials and their inherent logic, the focus should thus be on assessing the quality of relationships and associated integrative approaches at individual, collective and system levels that 'rattle' unsustainable social norms, cultures, political systems and structures, whilst moving from an understanding of people being 'agents to be changed' to being 'change agents'. Accordingly, methods have to identify change in narratives and levels of mainstreaming, as illustrated in this study.

At the same time, further research is needed to address the limitations of the present study, particularly more longitudinal studies to monitor long-term impacts and change, to better-understand how people absorb, internalise and subsequently integrate new insights into their work, and what can be done to further support this process, ultimately creating the knowledge base for evaluating and advancing the combination of methods for learning and implementation.

5 Conclusions

This research paper addresses the important topic of the potential of leadership and capacity building programs on sustainability transformation. It specifically focuses on programs that aim to nourish inner development to support culture and system change and accelerate work towards the Sustainable Development Goals. As there are a growing number of such courses been offered to diverse audiences in and outside academia, it is high time to critically evaluate their potential to contribute to sustainability outcomes across different scales. The present study addresses this gap.

On the basis of our results, we provide key principles for designing sustainability leadership and education programs (Fig. 1). They relate to:

- **Context and understanding: how we see the world** (comprehensive understanding of the nature of today's sustainability crises in a complex, constantly changing world, and one's role in it);
- **Learning approach: how we get to know** (safe space and integrative methods for exploring related inner dimensions and nurturing transformative capacities on a continuous basis);
- **Practical guidance and solutions: how we engage** (practical guidance on how to design and implement measures that link individual, culture and systems change); and
- **Quality control: how we ensure quality and equity considerations across all aspects** (ensuring quality education through the explicit consideration of ethics, the role of facilitators, and adequate monitoring and evaluation).

Together, these four essential pieces, or key ingredients, support individual, collective and planetary flourishing, by covering all key aspects of inner-outer transformation (ontology, epistemology, praxis, ethics; cf. Ives et al. 2023).

Put together, our results show how sustainability leadership and learning can become a vehicle for transformation across individual, collective and system levels, by adapting and combining inner development methods in ways that support participants in challenging current unsustainable social paradigms, and knowing how they can systematically integrate the consideration of the human dimension of sustainability within existing cultures, mechanisms and structures. Our findings advance knowledge on the complex intersection between sustainability, inner development and transformation, and set a precedent that other training institutions could follow or learn from.

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Data availability Anonymized intervention data have been deposited and are publicly available as of the date of publication. Data and code have been deposited at Zenodo <https://doi.org/10.5281/ZENODO.7277332>.

Declarations

Competing interests The authors declare no competing interests. The presented study is an exploratory, reflexive case study/ applied participatory analysis. It was carried out as a specific activity unfolded (the

development of the climate leadership program); and the author of the study was invited to accompany related processes, whilst simultaneously conducting research (Burns 2007; Glassman and Erdem 2014).

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References

- Artmann M (2023) Human-nature resonance in times of social-ecological crisis—a relational account for sustainability transformation. *Ecosyst People*. <https://doi.org/10.1080/26395916.2023.2168760>
- Bentz J, O'Brien K, Scoville-Simonds M (2022) Beyond “blah blah blah”: exploring the “how” of transformation. *Sustain Sci* 17:497–506. <https://doi.org/10.1007/s11625-022-01123-0>
- Braun V, Clarke V (2006) Using thematic analysis in psychology. *Qual Res Psychol* 3:77–101. <https://doi.org/10.1191/1478088706qp0630a>
- Bristow J, Bell R, Wamsler C (2022) Reconnection: meeting the climate crisis inside out. The Mindfulness Initiative and LUCSUS. <https://www.themindfulnessinitiative.org/Handlers/Download.ashx?IDMF=8d566cb4-15a0-4b39-9236-064eb302ef99>. Accessed 2 Sept 2023
- Burns D (2007) Systemic action research: a strategy for whole system change. Bristol University Press, Bristol
- CCCE (Center for Contemplative Science and Compassion-based Ethics) (2019) The SEE learning companion: social, emotional & ethical learning. Emory University. https://compassion.emory.edu/_includes/documents/SEE_Learning_Docs/SEE_Companion_March.pdf. Accessed 2 Aug 2023
- Corbin J, Strauss A (2008) Basics of qualitative research: techniques and procedures for developing grounded theory, 3rd edn. Sage Publications
- Figueres C, Rivett-Carnac T (2020) The future we choose: surviving the climate crisis. Knopf Publishing Group, New York
- Fritz R (1989) Path of least resistance: learning to become the creative force in your own life. Ballantine Books, New York
- Gilbert P (2017) Compassion: concepts, research and applications. Routledge, London
- Glassman M, Erdem G (2014) Participatory action research and its meanings: Vivencia, Praxis, Conscientization. *Adult Educ Q* 64:206–221. <https://doi.org/10.1177/0741713614523667>
- Grossman P, Niemann L, Schmidt S, Walach H (2004) Mindfulness-based stress reduction and health benefits: a meta-analysis. *J Psychosom Res* 57:35–43. [https://doi.org/10.1016/S0022-3999\(03\)00573-7](https://doi.org/10.1016/S0022-3999(03)00573-7)
- Hunecke M (2018) Psychology of sustainability: psychological resources for sustainable lifestyles. In: Hunecke M (ed) Personal sustainability: exploring the far side of sustainable development. Routledge, London, pp 33–50
- IDG Initiative (2021) Inner Development Goals (IDG): background, method and the IDG framework. IDG Initiative. https://static1.squarespace.com/static/600d80b3387b98582a60354a/t/61aa2f96dfd3fb39c4fc4283/1638543258249/211201_IDG_Report_Full.pdf. Accessed 2 Jun 2023
- IDG Initiative (2022) Inner Development Goals (IDG): phase 2 research report. https://idg.tools/assets/221215_IDG_Toolkit_v1.pdf. Accessed 2 Jul 2023
- Ives CD, Freeth R, Fischer J (2020) Inside-out sustainability: the neglect of inner worlds. *Ambio* 49:208–217. <https://doi.org/10.1007/s13280-019-01187-w>
- Ives CD, Schöpke N, Woiwode C, Wamsler C (2023) IMAGINE sustainability: integrated inner-outer transformation in research, education and practice. *Sustain Sci*. <https://doi.org/10.1007/s11625-023-01368-3>
- Kegan R, Lahey L (2009) Immunity to change: how to overcome it and unlock potential in yourself and your organization. Harvard Business Press, Brighton
- Kok BE, Singer T (2017) Effects of contemplative dyads on engagement and perceived social connectedness over 9 months of mental training: A randomized clinical trial. *JAMA Psychiat* 74(2):126–134. <https://doi.org/10.1001/jamapsychiatry.2016.3360>

- Liao Y (2022) Sustainable leadership: a literature review and prospects for future research. *Front Psychol* 13. <https://doi.org/10.3389/fpsyg.2022.1045570>
- Mar KA, Schöpke N, Fraude C et al (2023) Learning and community building in support of collective action: toward a new climate of communication at the COP. *WIREs Clim Change* 14:e832. <https://doi.org/10.1002/wcc.832>
- Mezirow J (2018) Transformative learning theory. In: Illeris K (ed) *Contemporary theories of learning: learning theorists ... in their own words*, 2nd edn. Routledge, London, pp 114–128
- Nowell LS, Norris JM, White DE, Moules NJ (2017) Thematic analysis: striving to meet the trustworthiness criteria. *Int J Qual Methods* 16:1609406917733847. <https://doi.org/10.1177/1609406917733847>
- Ramstetter L, Rupprecht S, Mundaca L, et al (2023) Fostering collective climate action and leadership: insights from a pilot experiment involving mindfulness and compassion. *iScience* 26(3):106191
- Rupprecht S, Wamsler C (2023) The global leadership for sustainable development program: inner development for accelerating action toward the sustainable development goals, evaluation report written for the IDG initiative and the templeton world charity foundation. Published by the Inner Green Deal and LUCSUS, Lund, Sweden
- Scott B, Amel E, Koger S, Manning C (2021) *Psychology for sustainability*, 5th edn. Routledge
- Segal Z, Williams M, Teasdale J (2012) *Mindfulness-based cognitive therapy for depression: a new approach to preventing relapse*. Guilford Press, New York
- Senge P (1999) *The dance of change: the challenges of sustaining momentum in learning organizations*. Bantam Doubleday Dell Publishing Group, New York
- Senge P (2006) *The fifth discipline: the art & practice of the learning organization*. Crown Business, New York
- Sharma M (2017) *Radical transformational leadership: strategic action for change agents*. North Atlantic Books, Berkeley
- Slingo J, Bates K, Nikiforakis N et al (2008) Developing the next-generation climate system models: challenges and achievements. *Phil Trans R Soc A: Math Phys Eng Sci* 367:815–831. <https://doi.org/10.1098/rsta.2008.0207>
- Stanley S (2012) Mindfulness: towards a critical relational perspective. *Soc Pers Psychol Compass* 6:631–641. <https://doi.org/10.1111/j.1751-9004.2012.00454.x>
- Strauss C, Lever Taylor B, Gu J et al (2016) What is compassion and how can we measure it? a review of definitions and measures. *Clin Psychol Rev* 47:15–27. <https://doi.org/10.1016/j.cpr.2016.05.004>
- Stuckey B, Smith J (2004) Building sustainable communities of practice. In: Stuckey B, Smith J (eds) *Knowledge networks: innovation through communities of practice*. IGI Global, Hershey, pp 150–164
- Thiermann UB, Sheate WR (2021) The way forward in mindfulness and sustainability: a critical review and research agenda. *J Cogn Enhanc* 5:118–139. <https://doi.org/10.1007/s41465-020-00180-6>
- Waldinger R, Schulz M (2023) *The good life: lessons from the world's longest scientific study of happiness*. Simon & Schuster, New York
- Walsh Z (2016) A meta-critique of mindfulness critiques: from McMindfulness to critical mindfulness. In: Purser RE, Forbes D, Burke A (eds) *Handbook of mindfulness: culture, context, and social engagement*. Springer International Publishing, Cham, pp 153–166
- Walsh Z, Böhme J, Wamsler C (2021) Towards a relational paradigm in sustainability research, practice, and education. *Ambio* 50(1):74–84
- Wamsler C, Bristow J (2022) At the intersection of mind and climate change: integrating inner dimensions of climate change into policymaking and practice. *Clim Change* 173:7. <https://doi.org/10.1007/s10584-022-03398-9>
- Wamsler C, Osberg G (2022) Transformative climate policy mainstreaming – engaging the political and the personal. *Glob Sustain* 5:e13. <https://doi.org/10.1017/sus.2022.11>
- Wamsler C, Osberg G, Osika W et al (2021) Linking internal and external transformation for sustainability and climate action: towards a new research and policy agenda. *Glob Environ Chang* 71:102373. <https://doi.org/10.1016/j.gloenvcha.2021.102373>
- Wamsler C, Bristow J, Cooper K, et al (2022) Theoretical foundations report: research and evidence for the potential of consciousness approaches and practices to unlock sustainability and systems transformation. Report written for the UNDP Conscious Food Systems Alliance (CoFSA), United Nations Development Programme UNDP. https://www.contemplative-sustainable-futures.com/_files/ugd/4cc31e_143f3bc24f2c43ad94316cd50fb88e4a.pdf. Accessed 23 May 2023
- Wamsler C, Schöpke N, Fraude C et al (2020) Enabling new mindsets and transformative skills for negotiating and activating climate action. Lessons from UNFCCC conferences of the parties, *Environ Sci Pol* 112:227–235. <https://doi.org/10.1016/j.envsci.2020.06.005>
- Woiwode C (2020) Inner transformation for 21st-century futures: the missing dimension in higher education. *Environ: Sci Policy Sustain Dev* 62:30–38. <https://doi.org/10.1080/00139157.2020.1764299>

- Woiwode C, Schöpke N, Bina O et al (2021) Inner transformation to sustainability as a deep leverage point: fostering new avenues for change through dialogue and reflection. *Sustain Sci* 16:841–858. <https://doi.org/10.1007/s11625-020-00882-y>
- Woods S, Rockman P, Kabat-Zinn J, Reibel D (2021) *Mindfulness-based stress reduction: protocol, practice, and teaching skills*. New Harbinger Publications, Oakland