

Article

Reflecting on Partnerships of Sustainability Learning: Enacting a Lewin–Deleuze–Guattari Rhizome

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Abstract: This paper works towards the enactment of a Lewin–Deleuze–Guattari rhizome. We assemble Deleuze and Guattari’s principles of the rhizome, Lewin’s idea of re-education, and reflections on the performance of one of the authors in the lecture hall, bringing into being what could be a rhizomatic partnership approach to sustainability learning in a higher education setting. The reflections are based on experiences delivering a sustainability module within a business education context, mainly for international students in Germany. The purpose of this paper is to illuminate possibilities of student–teacher partnership assemblages, aiming to motivate sustainability change agency on “people-yet-to-come”: those who are open to enacting *difference*, or multifaceted, heterogeneous, and often partial transformations addressing the current plethora of contemporary crises.

Keywords: rhizome; transformation; sustainability education; teacher–student partnership; change agency

1. Introduction

“Facing the Anthropocene, once the temptation to see it simply as a new avatar of the schema “Man facing Nature” has been set aside, there is probably a no better solution than to work at disaggregating the customary characterizations until we arrive at a new distribution of the agents of geohistory—new peoples for whom the term human is not necessarily meaningful and whose scale, form, territory, and cosmology all must be redrawn. To live in the epoch of the Anthropocene is to force oneself to redefine the political task par excellence: what people are you forming, with what cosmology, and on what territory?” [1] (pp. 143–144).

This paper reflects on a teacher–student partnership approach for the rhizomatic development of sustainability learning in higher education. In consonance with Latour’s claim for redefining the cosmology of “those-being-formed”, sustainability learning involves building one’s capacity to exert agency, which in turn is motivated by a value system that favors the enactment of multifaceted, heterogeneous, and often partial transformations.

If we, educators, want to have graduates, the “people-yet-to-come”, to be open to enacting difference; first, it is paramount to alter our thinking and behavioral habits, as well as our relation to our habitat [2]. It is within this problem that Kurt Lewin’s concept of re-education is invoked, as it shows concern with the promotion of change [3]—or “becoming other”. For Lewin, change agency is a key aspect to “rational action and democratic values” [4] (p. 14). Dominant ways of acting and thinking, such as the absolute emphasis on economic growth guided by some sort of senseless profit race, acts to the detriment of those whose voices may not be heard loud and clear—whether humans

or non-humans. In this way, education can stimulate people's agency, empowering learners to write their own biography, a biography that addresses the current plethora of contemporary crises: from climate change to the dissemination of fake news and its nefarious effects on the democratic plane. Conceptualized by Kurt Lewin [3], the term "re-education" is currently rarely used. Instead, it is more common to refer to it as transformation [5]. Coghlan and Jacobs [6] argue that "transformation is inclusive of the process of re-education" (p. 446) as it aims to change knowledge, beliefs, values, needs, emotional attachments and everyday conduct.

Moving with Lewin into the post humanist domain, paradoxically complicating and facilitating a partnership of learning-to-be, we, the authors, abandon reductionism and prevailing dichotomies, such as teacher/students and self/environment, rather forming hybrid forms of thinking and acting, where the Other, of whatever nature, is seen as a constitutive part of the assemblage—not as a mere appendix steadily experiencing the effects of human agency and will. Just as one has learned from the unfolding of Covid-19, post-philosophies do not legitimize humans and non-humans, whatever the latter may be, as independent units of analysis [7–9]. Equally, educators interested in a partnership for learning do not perform as separate from, or superior to, the students and their context. The segregation of what is *real*, *represented* and *subjective*, a pillar of more traditional ways of knowledge generation, is not considered in this article. The principle of democratic association among heterogeneous actors emphasize the importance attributed to the momentary, fragile conformation of actors and their associations in a given time and space—or "context"—when debating on the possibilities for learning partnerships. The preponderance given to relational practice sustains the political task of the "posts" [10] to rethink ontology: that of continuous relations as meaning generators. Despite the vast array of critical theoretical constructs within the "posts", they partially share an extension in the application of semiotics to make sense not only of language but also all stances of collective phenomena. One entity is determined by its relations, and that which this very entity is able to do is conditioned to the agency exerted by other related entities [8,11].

As a representative of the "posts", Deleuze and Guattari's rhizomatic philosophy [11] is particularly inspiring. Their concept of the rhizome is being discussed for some time within education studies [12–17]. Similar to Dewey [18] and Mumford's [19] interrelated understanding of notions of science, technology, and social change, the rhizome invites educators to further delve into interrelated perspectives, exploring a higher degree of freedom and creativity in knowledge generation processes. Influenced by botany, the rhizome is a non-hierarchical root system, a collective, or an assemblage of ever-changing interconnecting multiplicities with no central control system. The rhizome is not a metaphor in itself. Through the Deleuzian–Guattarian flat plane of immanence, or the abandonment of onto-epistemological hierarchies in the craft of science, rhizomes do not represent reality but are reality themselves, which in turn can be interpreted uniquely. We engage with the principles of the rhizome to think and write differently about education and student–teacher relationships. The interplay among diverse assemblages is uncertain, emergent, and complex, resulting in the phenomenon of "becoming other" or enacting difference, *ad nauseam*. It reminds us that everything—sustainability, students, teachers, ethics, theories, practices—are ontologically intertwined, rather than constituting singular entities that interact with one another without altering their very ontological substratum.

We, the authors, see the assemblage Lewin–Deleuze–Guattari as the main substance of that which we ought to bring into existence: a partnership approach to sustainability learning. As much as Law [20] (p. 150) argues, we are not interested in winning arguments but allowing theoretical intersections to flourish as "a set of possibly generative partial connections". From a post humanist perspective, there are two warrants for opening this flat territory. First, a rhizome will, eventually, connect with another tree or rhizome—which stands for the dialog established between the aforementioned thinkers. Second, as we acknowledge multiplicity and the vast possibilities of knowledge generation, we endorse the lack of consensus on the criteria for what could count as "meaningful knowledge" [21] (p. 255).

In what follows, we present the higher education learning context from which we enact the assemblage Lewin–Deleuze–Guattari. The principles of the rhizome and Lewin's observations on

re-education are introduced and then woven together with the reflection on the performance of one of the authors in the lecture hall, bringing into being what could be a rhizomatic partnership approach to sustainability learning in a higher education setting.

2. Actors in Context

The reflections are based on the experience of one of the authors delivering a sustainability module that is part of a B.A. in “Business Administration with Informatics” and of an exchange program for Indonesian students in a higher education institution in Germany. The course is entirely taught in English, while the student cohort is almost exclusively formed by international students from over 60 countries, mainly from Asia, Africa and the Middle East. The module engages with four broad concepts: globalization, corporate social responsibility, sustainability, and ethics. In light of 21st-century challenges, students critically explore how ethics, sustainability and globalization have an impact on the way business is conducted—as well as discussing ethical decision-making at global, national, organizational, and individual levels. I engage in reflexivity by discussing the challenges of teaching and learning with fellow educators, especially the second author, and by seriously considering both formal and informal feedback from students. With the aid of a reflective diary, I make sense of my performance in a cyclical manner as I register my impressions and ideas on how to improve it.

3. A Lewin–Deleuze–Guattari Rhizome

Lewin [3] describes re-education in terms of ten observations. These highlight that change involves cognition, values, and behavior, depending on social perception, as well as the belongingness to a group, to occur. His observations [3] (pp. 57–67) are as follows:

- The processes governing the acquisition of the normal and abnormal are fundamentally alike;
- The re-education process has to fulfil a task which is essentially equivalent to a change in culture;
- Even extensive first-hand experience does not automatically create correct concepts (knowledge);
- Social action no less than physical action is steered by perception;
- As a rule, the possession of correct knowledge does not suffice to rectify false perception;
- Incorrect stereotypes (prejudices) are functionally equivalent to wrong concepts (theories);
- Changes in sentiment do not necessarily follow changes in cognitive structure;
- A change in action-ideology, a real acceptance of a changed set of facts and values, a change in the perceived social world - all three are but different expressions of the same process;
- Acceptance of the new set of values and beliefs cannot usually be brought about item by item;
- The individual accepts the new system of values and beliefs by accepting belongingness to a group.

For the purpose of explaining how students can be partners of learning, we *messily* [8] associate Lewin’s observations with Deleuze and Guattari’s principles of the rhizome, that of cartography and decalcomania, connection and heterogeneity, multiplicity, and signifying rapture. As much as Deleuze and Guattari [11] perceive no separation among those, Lewin [3] sees his ten observations of re-education as closely interrelated. The following assemblage is just one way to demonstrate how a dialog between the rhizome and re-education can foster a partnership approach to sustainability learning, as any momentary coalescence of practices could manifest differently [22].

3.1. Cartography and Decalcomania

Cartography applies tracing and reproduction by fostering a variation on long time established forms of thoughts, while decalcomania is a technique that generates maps by creating structures, connections, and removing blockages [11]. The coincidental generation of maps facilitates open-mindedness and experimentation [11]. In my practice as a sustainability educator who engages in a partnership approach to university teaching, I found that both principles are equivalently important as higher education is responsible for knowledge transmission *and* production.

Here, the tracing of cartography is associated with transmissive university teaching. While many initiatives supporting sustainability education are provided in the higher education system, and environmental concern presents itself as a major societal issue, the necessary knowledge is not always performed by educators of higher education [23]. They are responsible for updating themselves on research advancements in relation to sustainability challenges, as the latter may emerge from various disciplines, likely moving one away from their comfort teaching zone. However, a partnership with students for sustainability learning also encourages educators to invite the former to contribute to the lecture content. I usually keep the last lecture open for students to determine its content. This is also an illustration of how I attempt to apply the practice of decalcomania by creating maps for learning partnerships with students about sustainability. The fast, complex, and constantly evolving field of sustainability requires not only learning but also experimentation from all the actors involved.

A lecturer wishing to have students as partners for learning recognizes that mapping is performed while tracing requires an alleged competence [11]. The establishment of rapport and the empowerment of students [24] are my highest performance priorities from the first encounter. Shrader [25] describes empowerment as a process, supporting learners to become aware of the impact they have on their environments and the degree of control they can exert over their contexts. It requires that sustainability educators perceive themselves as change agents with the capacity to facilitate and support learners to become sustainability change agents themselves. This is brought into existence by constantly asking oneself: what can I do? Being aware that no one has a blueprint solution for many challenges we now face, I do not see myself as the only competent person in the room or “the holder of the truth”, telling students what they must do. Instead, I encourage them to ask themselves what they can do [26]. I experiment with various teaching strategies to stimulate one’s own critical reflective practice in the context of 21st-century challenges. During the lectures, I give space for a critical discussion to flourish, for which the classical Socratic method [27] turned out to be a comprehensive approach. Moreover, expressive writing [28] and the use of disruption [29] are useful strategies to motivate personal reflection.

The principle of decalcomania also reminds me to create with every cohort a new learning group. As each cohort is unique, educators are attentive to this very uniqueness, utilizing their knowledge of the cohort to perform in ways that help establish a learning group for sustainability. One of Lewin’s observation states that “*the individual accepts the new system of values and beliefs by accepting belongingness to a group*” [3] (p. 67). Re-education aims to establish an “in-group” rhizome. Members feel that they belong to the group, and a strong “we-feeling” is created [3]. Group belonging supports the engagement of members in the discovery and ownership of facts and values which may have been previously rejected. The ownership is the belief that one discovered these facts themselves [3]. This fact and value finding process for, and by, the group is crucial in re-education. Lewin points out that “the teacher and the student have to feel as members of one group in matters involving sense of values” [3] (p. 67). While keeping in mind the principle of decalcomania, I use a few strategies to foster group cohesiveness in the module.

Being a facilitator of sustainability education requires the creation of a safe space in which students feel that the facilitator is neutral, non-judgmental and an in-group member of their sustainability learning group. I begin the module by showing respect for the various perspectives students demonstrate on sustainability. I conduct an icebreaker activity where students are asked to say out loud, “what comes to mind when thinking about the term sustainability”. My task is to take note of all statements on the board and engage in a conversation about the comment with the respective student. I usually foster this small conversation by asking follow-up questions. The aim is to show that everyone’s perspective is interesting, valid, and respected.

At the first teacher–student encounter, I introduce and define with students our psychological contract [30,31]. First, I share what I expect from them. After some brainstorming time, students share their expectations of me. The contract will then be posted on our digital learning platform so everyone can access it throughout the module. The psychological contract is also beneficial for psychological

safety [32]. Edmonson [33] exposes that the team shares a belief of safety within the group, therefore *becoming able* to take interpersonal risks. Furthermore, psychological safety nurtures critical discussions. Students share their beliefs within their group, not being exposed to interpersonal or social threats to their habits, career or employment, or when engaging in learning behaviors, such as asking for help, seeking feedback, admitting errors, demonstrating lack of knowledge, trying something new, or voicing dissenting views [33]. Students are also asked to define their own essay topic and deadlines, which usually results in a few suggestions for which they democratically vote. Weekly newsletters via email act as an open communicational channel as I share newly published articles—whether academic or newspapers—related to the module content. This strategy seeks to bring into being three crucial elements: my concern about their learning, the effort to foster an in-group feeling, and a way to help students connect with the lecture content.

One of Lewin's observation states that *"the processes governing the acquisition of the normal and abnormal are fundamentally alike"* [3] (p. 57). Behavior depends on the interaction of individuals with their environment: their belongingness to societal groups. The author [3] argues that processes of an individual either becoming a criminal or an honest person are identical and depend on the individual's perception, creating either an inadequate image (illusion) or an adequate one (reality). To assemble a partnership approach, the lecturer recognizes that processes making some learners believe that sustainability is a fad or fiction (illusion) are the same processes making others believe sustainability is an essential balancing act (reality). How one perceives sustainability is conditioned on what is socially accepted and involves peer-pressure. Lewin [3] points out that individuals are affected by group pressure *"in all areas—political, religious, social—including our beliefs of what is true or false, good or bad, right or wrong, real or unreal"* [3] (p. 58). As such, *"the re-education process has to fulfill a task which is essentially equivalent to a change in culture"* [3] (p. 59). Culture is understood analogically, referring to shared beliefs and assumptions of a group that one cannot have alone [6]. A given culture of a group enables one to incorporate new values and perceptions into daily life [3]. Lewin proposes that when the processes resulting either in *"illusions"* or *"realistic"* perceptions are identical, then re-education is a process that functions as a change in culture [3]. For example, the re-education of a carpenter to become a watchmaker requires a set of new skills and the acquisition of new routines, standards and values which characterize a watchmaker [3]. The challenge is that there is no *"right"* sustainable way of living; there is no *"right"* set of values or habits that every individual ought to acquire. As a facilitator, I support learners to build capacities in order to adapt to the ongoing threats of increasing uncertainty and risk of disasters because, *"as a rule, the possession of correct knowledge does not suffice to rectify false perception"* [3] (p. 61). I acknowledge that even extensive experience and knowledge of sustainability do not necessarily result in the *"correct"* perception of it. Lewin [3] highlights that this rule will equip one to be less surprised during encounters of resistance and inadequate illustrations or prejudices. An episode that disrupted me relates to the universe of child labor and exemplifies how the careful consideration of context—or the student's own rhizome of meaning and experience—is pivotal in enacting rhizomatic partnerships. During a lecture where child labor was being discussed, a student who had experienced such reality questioned their peers' straightforward, immediate condemnation of these practices. The student explained that their engagement with child labor was the only possible way to *"put food on the table"* at that point in time. In this case, rather than enacting an overall consensus, the child labor rhizome opened an unexpected bifurcation that led to more debate and sense-making, inevitably inviting other actors to enter the scene, such as the rights of the child, poverty, inequality, greed, and perhaps more substantially: the uniqueness and complexity of one's reality.

3.2. Connection and Heterogeneity

Deleuze and Guattari [11] (p. 7) explain that *"any point of a rhizome can be connected to anything other, and must be."* Students' personal connection with both the lecture content and the lecturer has the potential to stimulate interest and a sense of responsibility toward the environment and society, increasing the potential of becoming change agents [34]. In an interview in *"Die Zeit"* [35],

attachment researcher Liselotte Ahnert makes a strong appeal about the importance of a student–teacher relationship for the benefit of learning (translated by the authors).

Zeit: Where is attachment research not yet considered enough?

Ahnert: At schools. Because the same applies there as in the day-care center. Without ties, there is no education. Learning works best through relationships. However, teachers see themselves mainly as transmitters of knowledge. They are often unaware of the importance of their relationships with students. This is also one of the reasons why some children found it so difficult to motivate themselves to study during the school closings (as per Covid-19). Due to the lack of contact with their teachers, many no longer knew what and for whom they were supposed to study.

However, a good relationship with the students alone is not sufficient to potentialize their capacity of change agency. Students benefit from learning about individual/ group decision-making, perception, bias, worldviews/paradigms, and values for one’s understanding of *self* (in Lewin’s words) or *habits* (in Deleuze’s words)—a prerequisite for change. Lewin [3] notes that “*social action no less than physical action is steered by perception*” (p. 61). Similar to sustainability education, re-education aims to change individual social perception because it is only by transforming it that one’s social action will change [3]. My aim of establishing a partnership approach for learning is to increase one’s self-knowledge, engaging them in reflexivity and evoking a non-judgmental exchange of perspectives and perceptions, as “*incorrect stereotypes (prejudices) are functionally equivalent to wrong concepts (theories)*” [3] (p. 62). The experience of inadequate stereotyping will not change one’s understanding of the world [13]. Individuals engage in self-examination of their own perspectives and perceptions of the world—as well as alternative ones—in order to move away from stereotyping [3,6].

Lewin notes that changing perception and behavior would not happen only through experiences [3,6]. In his words: “changes of knowledge and beliefs, changes of values and standards, changes of emotional attachments and needs, and changes of everyday conduct occur not piecemeal and independently of each other, but within the framework of the individual’s total life in the group” [3] (p. 58). Sterling [36] points out that when sustainability is approached in a broad and open direction, individuals explore alternative worldviews and their own way of life. If there is not one proposition that potentially motivates change, one teaching strategy fits all would be insufficient for a partnership approach, as Lewin understands that “*even extensive first-hand experience does not automatically create correct concepts (knowledge)*” [3] (p. 60). There is a tendency in sustainability education (originated from environmental education) to promote pedagogic approaches primarily based on dialog and experience to foster critical engagement with own perspectives, dispositions and/or behavior [37–41]. Nevertheless, in order to become a change agent, open to constantly revise their understanding of self/habits in the context of sustainability challenges, the learner is collectively engaged with all its spheres. This means that we do not treat the social, economic, ecological, cultural, political and spiritual aspects in isolation from one another [7]. Nussbaum [42] suggests a holistic approach to education that should draw from different domains. Throughout the module, I am inspired by a whole system perspective [43], aiming to understand the “bigger picture” of the interconnectedness and heterogeneity of current sustainability challenges. I make use of Capra’s conceptual map of interconnected world problems based on Brown’s [44] book “Plan B 3.0”, Guattari’s ecosophy [45], illustrations of the Stern report [46]—highlighting the impact of global warming on the planet—and Delors’ [47] “21st-century tensions” to exemplify and illuminate the complex assemblage of sustainability challenges. It is important for students to recognize that many times we do not resist the temptation for the “short-cuts” offered by Cartesian dualism: frequently, students ask for “the key” or “the best way” to face a given problem. When discussing the Sustainable Development Goals (SDGs) [48], for instance, students tend to highlight one or some goals over the others, although they are interconnected, interdependent and are of systemic nature [49]. All these problems should be seen as just different facets of one single crisis: a crisis of perception. Here, the principle of heterogeneity teaches one to learn to balance and value

everything on the same plane of immanence. In class, despite being cautious not to engulf too deeply into dense posthumanist discussions, I persistently invoke Deleuze and Guattari's [11] (p. 25) "and . . . and . . . and" ontology. I remind the students throughout the module: it is not either-or. It is and.

3.3. Multiplicity

"All multiplicities are flat, in the sense that they fill or occupy all of their dimensions: we will therefore speak of a plane of consistency of multiplicities, even though the dimensions of this "plane" increase with the number of connections that are made on it. Multiplicities are defined by the outside: by the abstract line, the line of flight or deterritorialization according to which they change in nature and connect with other multiplicities. The plane of consistency (grid) is the outside of all multiplicities" [11] (p. 9).

The principle of multiplicity reminds us that change is not linear. An educator cannot influence the nature of changes that result from educational interventions, as one would only change if they consciously decide to do so. Lewin explains that "*acceptance of the new set of values and beliefs cannot usually be brought about item by item*" [3] (p. 66). Values and beliefs are systems with their own integrity, and for individuals to maintain one's self/habit, this integrity must be respected [6]. This also further explicates why I do not see my role as the facilitator to draw an "ideal" set of values. Instead, I support individuals to build the capacity to identify and question their own values. "*A change in action-ideology, a real acceptance of a changed set of facts and values, a change in the perceived social world – all three are but different expressions of the same process*" [3] (p. 64). Re-education will only result in permanent change if all three processes are sufficiently changed [3]. Similarly, Guattari indicates that all things are "continually reinvented, started again from scratch, otherwise the processes become trapped in a cycle of deathly repetition" [45] (p. 27). Lewin [3] refers to action-ideology as the perception that guides all action. Consequently, behavioral change requires that new facts and values are perceived and that one begins to act in accordance with these values [3]. It is also essential that the individual voluntarily engages in re-education based on freedom and acceptance, which creates an atmosphere of comfort, freedom to express one's own perspectives and disagreement, emotional security, and avoidance of pressure [3]. This safe space for the exploration of one's perspectives in a non-judgmental manner helps me construing my partnership with students.

In addition, a key value to sustainability is the sense of responsibility for the role we play and the impact we have not just locally but also globally. Here, the affective domain is critical. Indeed, many environmental and sustainability educational initiatives focus on socio-emotional dimensions to assess values and actions, along with ethical drivers for perceiving and behaving differently [50]. I integrate the emotional domain into my practice by designing visual cues that initially trigger emotional reactions and challenge social norms within discussions [51]. Where there is no dissent from the group-perspective, I act as the devil's advocate and pose counter-arguments or counter-questions that require individuals to think "outside" the group assemblage.

Art is also particularly beneficial for stimulating critical thinking and reflection [52], as well as building skills for cognitive, emotional, social and physical development [53]. Art has been increasingly used to raise public awareness [54], but there seems to be little regard to the usefulness of art or work from the public domain for teaching and learning in higher education contexts, including the one permeating Education for Sustainable Development [55]. While we are only beginning to explore art to foster sustainability [56], Molderez and Ceulemans [57] highlight that art potentially motivates systems thinking and supports the acquisition of sustainability competencies. Inspired by the principle of multiplicity and Lewin's teachings, I include abstract photography in my lecture material to address the multiple intelligences of the learners [58], as pictures can act as a visual stimulus to identify formal content and semiotic meaning [59].

However, a genuine connection with students, a heterogeneous content, and a consideration of the affective domain in teaching would still not be sufficient for the teaching of sustainability. Lewin points out that "*changes in sentiments do not necessarily follow changes in cognitive structure*" [3] (p. 62).

Lewin uses the example of an alcoholic who is aware that drinking alcohol is bad and does not want to carry on with this practice to illustrate that individual change depends less on knowledge, as emotional reactions can contrast with what one knows [3]. He shows that there is a danger to intensify the gap between how one should feel and the way one really feels, which will not result in changes, but in a bad individual conscience [3]. For this reason, ideally, emotions may act only as an initial unsettlement. I purposefully avoid any emotional disturbance in class. I do not leave students alone with discomforting feelings, rather guiding them to move beyond initial disruption towards deep reflection. Consequently, we ought to know that “the individual’s real and total involvement in the change process is a significant factor” [13] (p. 449). This is valid for students and educators. The latter should use teaching strategies and activities that foster active involvement, including emotional, cognitive, and behavioral aspects of the learner, allowing the enactment of a safe space to exchange perspectives and explore feelings and thoughts—even if they disagree with the dominant values system of their social group. Furthermore, demonstrating a genuine interest in what one teaches may generate positive assemblages of learning. As Powell [60] puts it: “passionate teachers create passionate students” (p. 52).

3.4. Signifying Rapture

According to Deleuze and Guattari [11] (p. 9), “there is a rupture in the rhizome whenever segmentary lines explode into a line of flight, but the line of flight is part of the rhizome. These lines always tie back to one another. That is why one can never posit a dualism or a dichotomy, even in the rudimentary form of the good and the bad. You may make a rupture, draw a line of flight, yet there is still a danger that you will reencounter organizations that restratify everything, formations that restore power to a signifier, attributions that reconstitute a subject—anything you like, from Oedipal resurgences to fascist concretions.”

The idea of a line of flight washes away my expectations that students must show signs of changes at the end of the module. Lines of flights are signifying ruptures of assemblages, a result of mapping rather than tracing, that is either creative, resulting in change, or destructive, for example, by reaffirming the status quo. A key theme in sustainability is the butterfly effect [61], which links closely with Deleuze and Guattari’s [11] idea of multiplicity. It is the understanding that every action has a multitude of reactions in other planes, making it impossible for educators to notice all the small changes triggered via learning interventions.

In a rhizome, there are three processes that can alter the assemblage components: territorialization, deterritorialization and reterritorialization. Territorialization stabilizes the nature of a given assemblage. A facilitator simply territorializes via transmissive delivery of a learning unit, a tracing of knowledge where students become a piece in the learning unit’s reproductive apparatus. On the other hand, the process of deterritorialization destabilizes an assemblage. For example, a student can deterritorialize the learning unit by giving feedback on, making contributions to, and engaging in it, if their voices are being considered by the educator. The process of reterritorialization happens when a given assemblage relates to another, therefore forming a new assemblage. This can be illustrated by a rethinking of the student–teacher relationship in higher education. Through passionate facilitation, with consideration of the principles of the rhizome and Lewin’s observations, we may enhance the possibilities to draw lines of flight.

4. Moving Forward with a Lewin–Deleuze–Guattari Rhizome

Concluding in totum is utopian if one considers reality as a continuum of uncertainty. We, the authors, traveling with *post* philosophies, see sustainability change agency as “becoming-enablers”, rather than “remaining-confiners”. As one delves into Lewin–Deleuze–Guattari rhizome, it becomes progressively easier to accept that conclusions favor the reductionist, unwanted loss of complexity within learning assemblages. As such, this rhizome-paper is only one way of how a partnership with students may come into being and by no means seeks to exhaust the enactment of future assemblages of meaning,

for example, one that highlights non-human entanglements within student–teacher relationships and technological artifacts. Partnerships for sustainability learning are based on complex enactment of realities, empirically localized tactics and strategies, theoretical experimentations, and aversion to generalizations. The rhizome enacted in this paper opens spaces for unpredictability and continuity. We deny the existence of a single world “out-there” waiting to be unproblematically discovered [8], which in turn philosophically nullifies the existence of any a priori “essence” [7]. A partnership approach to sustainability education relies on continuous experimentation. No ends. Only beginnings.

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References

1. Latour, B. *Facing Gaia: Eight Lectures on the New Climatic Regime*, 1st ed.; Polity Press: Cambridge, UK, 2017.
2. Hroch, P. Deleuze, Guattari, and Environmental Pedagogy and Politics: Ritournelles for a planet-yet-to-come. In *Deleuze and Guattari, Politics and Education*; Carlin, M., Wallin, J., Eds.; Bloomsbury: London, UK, 2014; pp. 49–75.
3. Lewin, K. *Resolving Social Conflicts: Selected Papers on Group Dynamic*; Harper & Brothers: Washington, DC, USA, 1948.
4. Caldwell, R. *Agency and Change: Rethinking Change Agency in Organizations*; Routledge: New York, NY, USA, 2006.
5. Reason, P.; Torbert, W.R. The action turn: Toward a transformational social science. *Concepts Transform.* **2001**, *6*, 1–32. [CrossRef]
6. Coghlan, D.; Jacobs, C. Kurt Lewin on Reeducation: Foundations for Action Research. *J. Appl. Behav. Sci.* **2005**, *41*, 444–457. [CrossRef]
7. Latour, B. *Pandora’s Hope: Essays on the Reality of Science Studies*; Harvard University Press: Cambridge, MA, USA, 1999.
8. Law, J. *After Method: Mess in Social Science Research*; Routledge: London, UK, 2004.
9. Salomão Filho, A.; Kamp, A. Performing mundane materiality: Actor-Network theory, global student mobility and a reformation of ‘social capital’. *Discourse Cult. Politics Educ.* **2019**, *40*, 122–135. [CrossRef]
10. St. Pierre, E.A. The posts continue: Becoming. *Int. J. Qual. Stud. Educ.* **2013**, *26*, 646–657. [CrossRef]
11. Deleuze, G.; Guattari, F. *A Thousand Plateaus: Capitalism and Schizophrenia*; The University of Minnesota Press: Minneapolis, MN, USA, 1987.
12. Kinchin, I.M.; Gravett, K. Concept mapping in the age of Deleuze: Fresh perspectives and new challenges. *Educ. Sci.* **2020**, *10*, 82. [CrossRef]
13. Beighton, C. Assessing the mess: Challenges to assemblage theory and teacher education. *Int. J. Appl. Behav. Sci.* **2013**, *26*, 1293–1308. [CrossRef]
14. Le Grange, L.L.L. Sustainability in higher education: From arborescent to rhizomatic thinking. *Educ. Philos. Theory* **2011**, *4*, 742–754. [CrossRef]
15. Sellers, W.; Gough, N. Sharing outsider thinking: Thinking (differently) with Deleuze in educational philosophy and curriculum inquiry. *Int. J. Qual. Stud. Educ.* **2010**, *23*, 589–614. [CrossRef]
16. Clarke, D.A.G.; Mcphie, J. From places to paths: Learning for sustainability, teacher education and a philosophy of becoming. *Environ. Educ. Res.* **2015**, *22*, 1002–1024. [CrossRef]
17. Carlin, M.; Wallin, J. *Deleuze & Guattari, Politics and Education: For a People-Yet-to-Come*; Bloomsbury Publishing Plc: London, UK, 2014.
18. Dewey, J. *The Public and its Problems*; Henry Holt and Co.: New York, NY, USA, 1927.
19. Mumford, L. *Technics and Civilization*; Harcourt, Brace and Co.: New York, NY, USA, 1934.
20. Law, J. Actor Network Theory and Material Semiotics, 2007. Available online: <http://www.heterogeneities.net/publications/Law2007ANTandMaterialSemiotics.pdf> (accessed on 30 September 2020).
21. Cilliers, P. Complexity, deconstruction and relativism. *Theory Cult. Soc.* **2005**, *22*, 255–267. [CrossRef]

22. Woolgar, S. Struggles with representation: Could it be otherwise? In *Representation in Scientific Practice Revisited*; Coopmans, C., Vertesi, J., Lynch, M., Woolgar, S., Eds.; MIT Press: Cambridge, MA, USA, 2014; pp. 329–332.
23. del Carmen Olmos-Gómez, M.; Estrada-Vidal, L.I.; Ruiz-Garzón, F.; López-Cordero, R.; Mohamed-Mohand, L. Making future teachers more aware of issues related to sustainability: An assessment of best practices. *Sustainability* **2019**, *11*. [[CrossRef](#)]
24. Harvey, L.; Burrows, A. Empowering Students. *New Acad.* **1992**, *1*, 1ff.
25. Shrader, S.R. Learner Empowerment—A perspective. *Internet TESL J.* **2003**, *9*. Available online: <http://iteslj.org/Articles/Shrader-Empowerment.html> (accessed on 30 September 2020).
26. Le Grange, L.L.L. Environmental education after sustainability. In *Post-Sustainability and Environmental Education: Remaking Education for the Future*; Jickling, B., Sterling, S., Eds.; Palgrave Macmillan: Cham, Switzerland, 2017; pp. 93–110.
27. Socratic Method Research Portal. Available online: <http://socraticmethod.net> (accessed on 30 September 2020).
28. Pennebaker, J.W.; Chung, C.K. Expressive writing: Connections to physical and mental health. In *The Oxford Handbook of Health Psychology*; Friedman, H.S., Ed.; Oxford University Press: Oxford, UK, 2011; pp. 417–437.
29. Tillmanns, T. Learning sustainability as an effect of disruption. *Environ. Educ. Res.* **2019**, *26*, 14–26. [[CrossRef](#)]
30. Rousseau, D.M. Psychological and implied contracts in organizations. *Emp. Responsib. Rights J.* **1989**, *2*, 121–139. [[CrossRef](#)]
31. Argyris, C. *Understanding Organizational Behavior*; The Dorsey Press: Homewood, IL, USA, 1960.
32. Schein, E.H.; Bennis, W. *Personal and Organizational Change through Group Methods*; John Wiley: New York, NY, USA, 1965.
33. Edmonson, A. Psychological safety and learning behavior in work teams. *Adm. Sci. Q.* **1990**, *44*, 1–20.
34. Thomas, I. Critical thinking, transformative learning, sustainable education, and problem-based learning in universities. *J. Transform. Educ.* **2009**, *7*, 245–264. [[CrossRef](#)]
35. Zeit Online—Bindung Muss Sich Jeder Selbst Erarbeiten. Available online: <https://www.zeit.de/2020/35/kinderpsychologie-eltern-bindung-kita> (accessed on 30 September 2020).
36. Sterling, S. Transformative learning and sustainability: Sketching the conceptual ground. *Learn. Teach. High. Educ.* **2010**, *5*, 17–33.
37. Scott, W.; Gough, S. *Sustainable Development and Learning: Framing the Issues*; Routledge: London, UK, 2003.
38. Cotton, D.R.E.; Winter, J. It's not just bits of paper and light bulbs: A review of sustainability pedagogies and their potential for use in higher education. In *Sustainability Education: Perspectives and Practices across Higher Education*; Jones, P., Selby, D., Sterling, S., Eds.; Earthscan: London, UK, 2010.
39. Thomas, I. Special issue—Pedagogy for education for sustainability in higher education. *Sustainability* **2014**, *6*, 1705–1708. [[CrossRef](#)]
40. Wals, A.E.J. Sustainability in higher education in the context of the UNDES: A review of learning and institutionalization processes. *J. Clean. Prod.* **2014**, *62*, 8–15. [[CrossRef](#)]
41. Tilbury, D. *Education for Sustainable Development: An Expert Review of Processes and Learning*; UNESCO: Paris, France, 2011.
42. Nussbaum, M.C. *Not for Profit: Why Democracy Needs the Humanities*; Princeton University Press: Princeton, NJ, USA, 2010.
43. Sterling, S. Whole Systems Thinking as a Basis for Paradigm Change in Education: Explorations in the Context of Sustainability. Ph.D. Thesis, Centre for Research in Education and the Environment, University of Bath, Bath, UK, 2003.
44. Brown, L.R. *Plan B 3.0: Mobilizing to Save Civilization*; Earth Policy Institute: Washington, DC, USA, 2008.
45. Guattari, F. *The Three Ecologies*; Éditions Galilée: Paris, France, 1989.
46. Stern, N. *The Economics of Climate Change: The Stern Review*; Cambridge University Press: Cambridge, UK, 2007.
47. Delors, J. *Learning: The Treasure Within*; UNESCO: Paris, France, 1996.
48. UN. *Transforming Our World: The 2030 Agenda for Sustainable Development*. 2015. Available online: <https://sustainabledevelopment.un.org/post2015/transformingourworld/publication> (accessed on 30 September 2020).
49. Nillsson, M.; Griggs, D.; Visbeck, M. Map the interactions between Sustainable Development Goals. *Nature* **2016**, *534*. Available online: <https://www.nature.com/news/policy-map-the-interactions-between-sustainable-development-goals-1.20075> (accessed on 30 September 2020).

50. O'Donoghue, R.; Taylor, J.; Venter, V. How are learning and training environments transforming with ESD? In *Issues and Trends in Education for Sustainable Development*; Leicht, A., Heiss, J., Byun, W.J., Eds.; UNESCO: Paris, France, 2018.
51. Tillmanns, T.; Holland, C.; Salomão Filho, A. Design criteria for visual cues used in disruptive learning interventions within sustainability education. *Discourse Comm. Sustain. Educ.* **2017**, *8*, 5–16. [[CrossRef](#)]
52. Kakouris, A. Using art to trigger critical reflection in entrepreneurship. *Exp. Entrep. Exer. J.* **2014**, *1*, 26–33.
53. Dewey, J. *Art as Experience*; The Berkley Publishing Group: New York, NY, USA, 1934.
54. Kilaru, A.S.; Asch, D.A.; Sellers, A.; Merchant, R.M. Promoting public health through public art in the digital age. *Am. J. Public Health* **2014**, *104*, 1633–1653. [[CrossRef](#)] [[PubMed](#)]
55. Eernstman, N.; Wals, A.E.J. Locative meaning-making: An arts-based approach to learning for sustainable development. *Sustainability* **2013**, *5*, 1645–1660. [[CrossRef](#)]
56. Chong-Wen, C. Incorporating artistic thinking into sustainability. *J. Clean. Prod.* **2018**, *198*, 1007–1012. [[CrossRef](#)]
57. Molderez, I.; Ceulemans, K. The power of art to foster systems thinking, one of the key competencies of education for sustainable development. *J. Clean. Prod.* **2018**, *186*, 758–770. [[CrossRef](#)]
58. Gardner, H. *Frames of Mind: The Theory of Multiple Intelligences*; Basic Books: New York, NY, USA, 1983.
59. Récka, A. Interpretation of visual inputs as a tool for measuring the effectiveness of fine arts education with an emphasis on the disciplines of theory and art history. *Ad Alta: J. Interdiscip. Res.* **2019**, *8*, 204–209. Available online: http://www.magnanimitas.cz/ADALTA/0802/papers/A_recka.pdf (accessed on 30 September 2020).
60. Powell, M.G. Passionate teachers create passionate students. *Delta Kappa Gamma Bulletin* **2005**, *71*, 52–54.
61. McMahon, M.; Hadfield, M. The butterfly effect: Creative sustainable design solutions through systems thinking. *FAIM Intell. Manuf. Now.* **2007**. Available online: http://eprints.bournemouth.ac.uk/9727/1/FAIM2006_McM-244.pdf (accessed on 30 September 2020).

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