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Rhizomatic Learning in Action

A Virtual Exposition for Demonstrating Learning Rhizomes

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ABSTRACT

In this paper, we developed a virtual exposition as a model to visualize and demonstrate the dynamic and non-linear affordances of a learning rhizome. Virtual expositions are non-linear multimodal web installations that facilitate the creation of interconnections through which the *research as practice* and the *practice as research* are highlighted and communicated more effectively. Through a specific virtual exposition platform, we created a visual and performative representation of a rhizomatic learning course, allowing visitors to experience the complexity, multiplicity, unpredictability, and multivoicedness of such an approach in an isomorphic way. A complex learning rhizome is a performative confluence of human and non-human actors that engages people, resources, processes, and contextual parameters. As such, it is impossible to be represented in any representational format. The virtual exposition developed here attempts to offer a fair approximative model of rhizomatic learning which is far better than text-only linear representations. This paper offers a new view to rhizomatic learning as an applied practice that can enhance teaching and catalyze learning through complex synergies and dynamics. The originality of this paper lies in its attempt to bridge linear with non-linear academic research formats in order to offer a multimodal and performative model of rhizomatic learning. Theoretical and practical implications for learning and teaching are discussed.

KEYWORDS

Rhizomatic Learning, Virtual Expositions, Complex Systems, Systems Thinking, Researchcatalogue

1 Introduction

A plethora of terms have been used to describe a holistic, systemic apprehension of learning: ecologies of mind, learning communities, communities of practice, learning organizations, rhizomatic learning, connected learning, collaborative and cooperative learning, connectivism, learning networks, and learning ecologies. In the search for *the pattern that connects* (Bateson, 1979) all these terms, a common dominator is a conceptualization of learning as an emergent phenomenon, as something that happens within a complex system of meaningful synergies.

The concept of *Community of Practice* fits well within the systems theory tradition (Wenger, 2010). According to Lave and Wenger (Lave & Wenger, 1991), learning can be actually understood as the 'side effect' of the active participation and engagement in a community of practice, an informal social learning system. According to Wenger (Wenger, 2010), the community of practice "is a perspective that locates learning, not in the head or outside it, but in the relationship between the person and the world, which for human beings is a social person in a social world" [p. 179]. Senge (Senge, 1990) also theorized the concept of the *learning organization*, a coherent whole able to demonstrate emergent behavior. In a learning organization, there is a form of learning that takes place and can be realized only in the group-as-a-whole level: what the whole organization is able to achieve that cannot be reduced to any linear sum of its members' potentials. Connectivism theory also focuses on a network conception of learning (Downes, 2020).

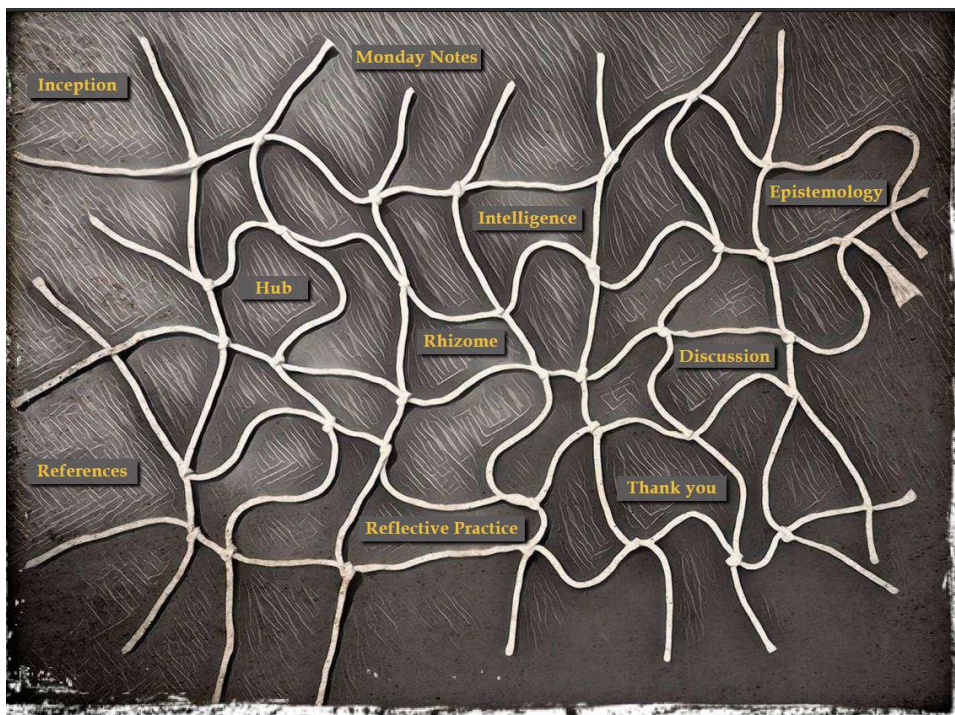


Figure 1: The virtual exposition used to visualize and demonstrate the dynamic and non-linear affordances of a learning rhizome. The landing page contains ten nodes that can be visited in any order, like the plateaus in the conception of the rhizome by Deleuze and Guattari. Available at: <https://doi.org/10.22501/rc.782366>

Following this tradition of thinking about learning as something not located in the head or the individual mind, but in an ecology of mind (Bateson, 1972), this paper tries to offer a new view to rhizomatic learning theory (Cormier, 2008; Deleuze & Guattari, 1987) by demonstrating a living rhizome through a virtual exposition (Figure 1). A virtual exposition offers a non-linear, multimodal, and artistic format, aiming to develop an engaging relationship between representation and performance (Schwab, 2019). This format was chosen to study learning rhizomes due to its non-linear navigation affordances. Virtual expositions facilitate the creation of interconnections through which the *practice as research* is highlighted and communicated more effectively (Schwab, 2014). The virtual exposition discussed in this paper was developed on *Research Catalogue*, an artistic research platform offered by the Society for Artistic Research (SAR) and hosted by the KTH Royal Institute of Technology in Stockholm (<https://www.researchcatalogue.net>). This research platform allows users to publish stable versions of virtual expositions as academic preprints. The exposition discussed here is available at: <https://doi.org/10.22501/rc.782366>

2 Rhizomatic Learning

A Rhizome, in the words of Deleuze and Guattari (Deleuze & Guattari, 1987),

has no beginning or end; it is always in the middle, between things, interbeing, intermezzo ... the rhizome is alliance, uniquely alliance ... Where are you going? Where are you coming from? What are you heading for? These are totally useless questions ... proceeding from the middle, through the middle, coming and going rather than starting and finishing. [p. 25]

The rhizome as a metaphor for learning comes from the philosophical conception above, as well as from the botanical original, a network of interconnected roots, ever-expanding, always in the becoming, with no beginning or end (Cormier, 2008; Kairiené, 2020). Therefore, rhizomatic learning can be defined as the process of extending, nurturing, cultivating, and catalyzing the development of a living network, consisting of knowledgeable agents, both human and artificial, and material objects/resources. In this context, learning can be realized as the creative capacity of such rhizomes to build upon existing resources and create new connections, acquire new nodes, and expand even further in different directions (Figure 2).

The role of the educator in such rhizomatic ecology is to empower participants to create alternative connections, new networks of thinking, and new patterns of relating with each other, and with other available human nodes or non-human learning resources. But it is not the educator that actually educates the students. The rhizome as a whole becomes the teaching apparatus, a multiplier of perspectives, and an amplifier of synergies. In such epistemology of learning, the primary role of the educator is not to teach in a straightforward manner, but rather to catalyze and facilitate the development of the rhizome that will indirectly drive learning toward the desired direction. Paraphrasing Yalom's words (Yalom & Leszcz, 2005), the group facilitator's main job is to create the

machinery of learning, to set it in motion, and to keep it operating with maximum effectiveness. The educator's authority is the authority to empower the rhizome:

In a social network, people are empowered by being connected to the network. Power as empowerment means facilitating this connectedness. The network hubs with the richest connections become centers of power. They connect large numbers of people to the network and are therefore sought as authorities in various fields. Their authority allows these centers to empower people by connecting more of the network to itself. (Capra & Luisi, 2014, p. 14)

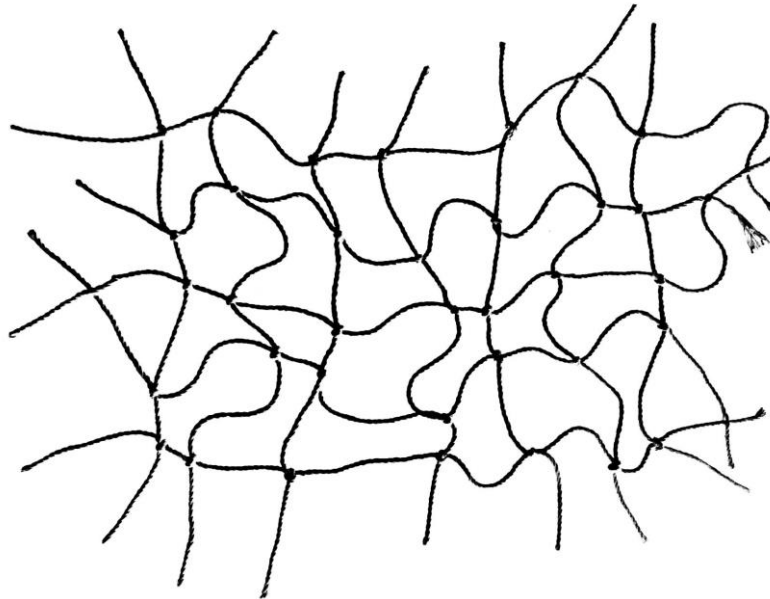


Figure 2: A network graph to help us visualize rhizomatic learning. A rhizome has no fixed beginning or end; it is always in the middle, always in the becoming. Networking is the very pattern of life, and rhizomatic learning can be realized as the creative capacity of such formation to build upon existing resources and create new connections, acquire new nodes, and expand even further in different directions; in von Foerster's words, to increase the number of available choices

Collaborative activities and systematic group work with students (Brailas, Koskinas, & Alexias, 2017) forge learning connections and help the formation and development of a complex learning system, with the participants being the constituent parts and the manifestations of a learning rhizome in the becoming. Such an endeavor is not an easy one. The key to promoting such knowledge projects is to know the art of developing meaningful synergies within a group, something that systemic practitioners and group facilitators have practiced long before (Brailas et al., 2019).

According to the theory of autopoiesis by Varela and Maturana (Capra & Luisi, 2014), "living systems continually create, or recreate, themselves by transforming or replacing their components. They undergo continual structural changes while preserving their web-like patterns of organization. Understanding life means understanding its inherent change processes" [p. 316]. Treating the learning rhizome as a living system implies respecting while trying to activate and catalyze its own potential for development and growth. According to

Yalom and Leszcz (Yalom & Leszcz, 2005), "Once a group is a physical reality, the therapist's energy must be directed toward shaping it into a therapeutic social system. An unwritten code of behavioral rules or norms must be established that will guide the interaction of the group" [p. 120].

This is the idea of a group-as-a-whole pedagogy, where students co-create a self-organizing learning rhizome in the way that Kauffman (Kauffman, 1996) describes life through the process of coevolution:

In coevolving systems, each partner clammers up its fitness landscape toward fitness peaks, even as that landscape is constantly deformed by the adaptive moves of its coevolutionary partners ... As if by an invisible hand, each adapting species acts according to its own selfish advantage, yet the entire system appears magically to evolve to a poised state where, on average, each does as best as can be expected. [p. 24]

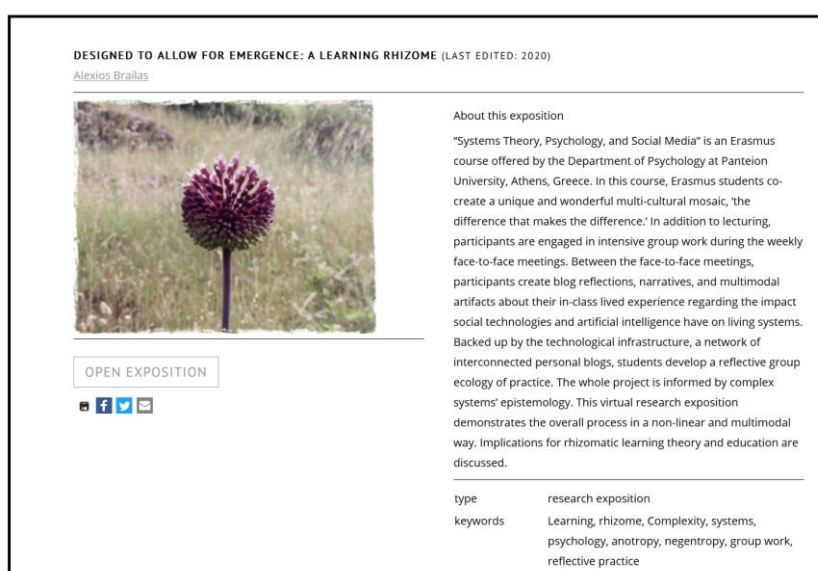


Figure 3: The "Designed to Allow for Emergence: A Learning Rhizome" virtual exposition being developed in the Research Catalogue's ecosystem

3 Experiencing the Rhizome: The "Designed to Allow for Emergence" Virtual Exposition

The *Designed to Allow for Emergence: A Learning Rhizome* is a virtual exposition developed in the Research Catalogue platform to demonstrate the development, function, and performance of an academic course based on rhizomatic learning (Brailas, 2020) (Figure 3). *Systems Theory, Psychology, and Social Media* is an Erasmus course offered by the Department of Psychology at Panteion University, Athens, Greece. The course blog is available at: <https://emergence.edublogs.org>. In this course, Erasmus students co-create a unique and wonderful multi-cultural environment. In addition to lecturing, participants are engaged in intensive group work during the weekly face-to-face meetings (Brailas et al., 2019; Brailas, Koskinas, et al., 2017). Between the face-to-face meetings, participants create

blog reflections, narratives, and multimodal artifacts about their in-class lived experience regarding the impact social technologies and artificial intelligence have on living systems (Brailas, Koskinas, & Alexias, 2016). Backed up by the technological infrastructure, a network of interconnected personal blogs, students develop a reflective group ecology of practice. The course is informed by experiential learning and complex systems' epistemology (Brailas, Avani, et al., 2017), and we think it represents a nice paradigm of a rhizomatic learning project that is *designed enough to allow for emergence*. The corresponding virtual research exposition demonstrates the overall process in an isomorphic, non-linear, and multimodal way, and highlights implications for rhizomatic learning theory and education.

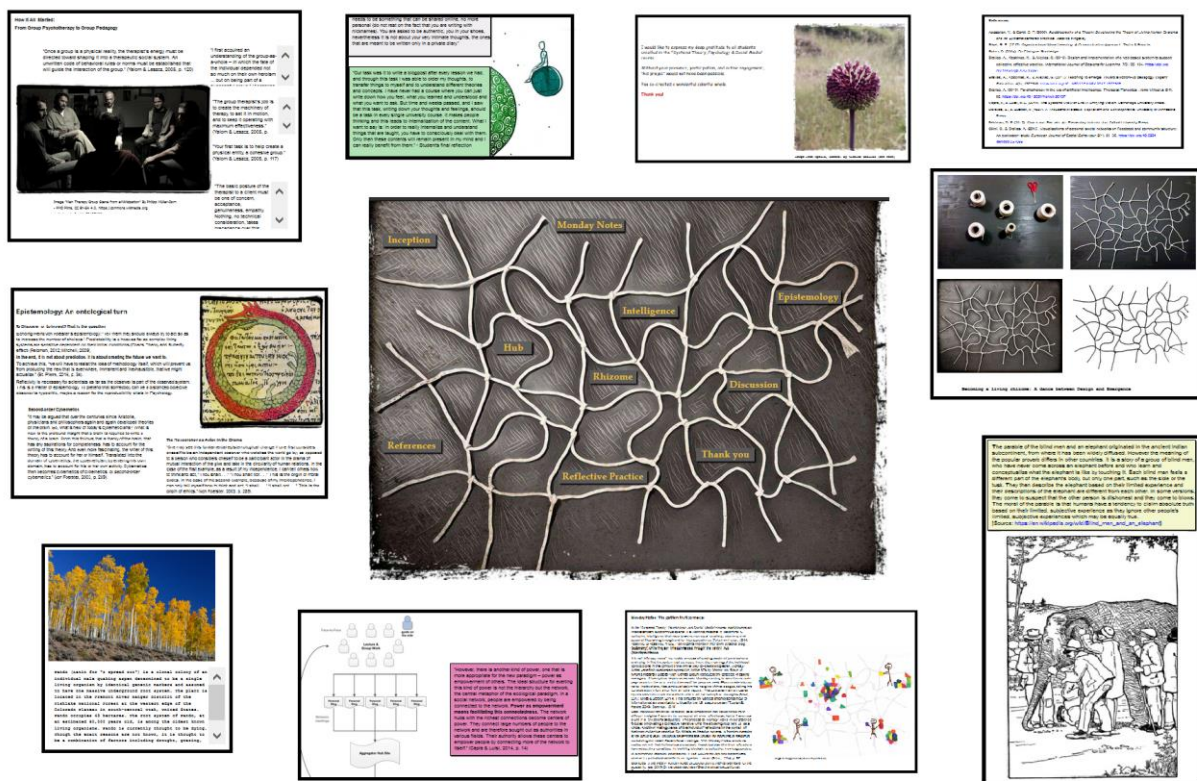


Figure 4: The learning rhizome as a non-linear virtual exposition at www.researchcatalogue.net. It contains ten nodes, corresponding to plateaus in Deleuze and Guattari's terms. There are 3,628,800 unique ways to traverse this rhizome, with every choice made reducing the subsequent number of available alternatives. To experience exploring this rhizome, please visit the published virtual exposition at: <https://doi.org/10.22501/rc.782366>

3.1 Traditional Articles and Research Expositions

Designed to allow for Emergence: A Learning Rhizome (Brailas, 2020) is a non-linear multimodal research exposition, the equivalent to a research article in traditional academic journals. This kind of virtual exposition delivers epistemic surplus by inspiring multiple ways to explore the knowledge (re)presented rather than imposing specific interpretations. There are multiple entry points and ways to traverse the virtual rhizome in this exposition. In the words of Deleuze and Guattari (Deleuze & Guattari, 1987):

the rhizome connects any point to any other point ... A plateau is always in the middle, not at the beginning or the end. A rhizome is made of plateaus ... whose development avoids any orientation toward a culmination point or external end. [pp. 21-22]

If we consider this research exposition's rhizome, it contains ten nodes, or plateaus in Deleuze and Guattari terms, namely: *Inception, Hub, Monday Notes, Reflective Practice, Rhizome, Intelligence, Epistemology, Discussion, References, and Thank-you* (Figure 4). If all these plateaus were sections in a traditional article, there would have been only one way to traverse them. Of course, in a linear text, one can skip sections or choose their own order, e.g., read first the abstract and then jump to the results, and then check the methods or read the discussion. Nevertheless, the affordances of traditional text media impose an official or default way, usually a hierarchical top-down one, to access them. In a non-linear virtual exposition, this is not the case. As with a rhizome has no beginning or end, and it is always in the middle (Deleuze & Guattari, 1987).

But what are the possible ways to traverse this exposition's virtual rhizome? As far as there are 10 nodes/plateaus, the possible combinations are the result of this multiplication: $10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2$. That is 3,628,800 different ways to traverse the rhizome, with every choice made reducing the subsequent number of available alternatives. Although we can imagine most people starting from the top-left and moving in some way toward the right-down corner of Figure 1 (introductory screen), it is impossible to know the exact route a visitor would take to explore this research exposition. But each different unique pathway taken will lead to different lived experiences, different sense-making of the material exposed, and in the end, to a different recorded personal history. Therefore, it is an inherent affordance of this rhizome to create multiple performances depending on each visitors' serendipitous choices. 'Studying' this virtual research exposition becomes an experiment with *singularity*, a point where the available choices grow exponentially (Brailas, 2019). Nevertheless, that was exactly the aim of the *Systems Theory, Psychology, and Social Media course*, and something not to regret but to celebrate instead. In the words of von Foerster (von Foerster, 2003): "*Tell them they should always try to act so as to increase the number of choices*" [p. 295]

3.2 The Practice of Education as Research

The virtual exposition attempts to build a different model of learning and teaching based on group work, experiential learning, and reflective practice in order to cultivate a rhizomatic learning community. This model is put into practice in the "Systems Theory, Psychology, and Social Media" course. The teaching process during the face-to-face meetings consists of lecturing and active learning (through group work) periods that allow intra- and inter-communication and reflection on multiple levels. The process continues online in the time between the physical meetings as an ever-evolving learning experience, due to the function of the central course hub that allows participants to share their personal reflections and narratives regarding the course (<https://emergence.edublogs.org>) (Brailas, Koskinas, et al., 2017). The present study explores the epistemology behind this course in an isomorphic,

homologous way, as a virtual non-linear exposition, following the basic premise that free information flow between knowledgeable agents is the essential prerequisite for new knowledge to emerge.

The post-qualitative, performative aspect (Jandrić, 2020; St. Pierre, 2016, 2019) of this exposition seems to best fit the main hypothesis of this research. Education is demonstrated here as the practice of creating learning rhizomes. In such an approach to education, teachers should not impose rigid universal and indisputable interpretations. Instead, teachers and students should combine their best ingredients to create learning rhizomes that will be traversed (or interpreted in a cognitive level) by the participants in any possible way they could imagine or will. In the virtual exposition presented here, research and education are exposed as rhizomatic and performative processes, the fundamental ways to cultivate a collective intelligence mindset.

The virtual explorers of this exposition are facilitated to create their own bridges between the plateaus, to develop their own mental representations, cognitive rhizomes, meaning networks, mind maps, conceptual graphs, personal narratives, or whatever they prefer to call it. This is not about a 'copy and paste' procedure of an ideal original blueprint to be reproduced and further disseminated. This is rather the realization of a relational confluence (Gergen, 2009), a performative dance between processes and content. The rhizome invites you in the introductory page:

Dear visitor, please feel free to explore this research exposition and traverse it in any way you like. There is no right or wrong, official, or default way. Keep in mind that your way into this will probably be unique. Do not feel alone in this journey but blessed to have this opportunity to carve up your own route. Many other explorers will traverse their own unique routes, and all together, they will co-create an ever-expanding multiplicity. This is a virtual jigsaw in the becoming, where the jigsaw parts are not the virtual plateaus and their contents. The jigsaw parts are the visitors of this exposition. Me and you, and everyone else. Can you imagine the invisible rhizome we will all co-create? Do you want to be part of this confluence?

3.3 Designed Enough to Allow for Emergence

Rhizomatic learning is not incompatible with traditional conceptualizations of learning. On the contrary, periods of linear and non-linear teaching can co-exist and complement each other. In living systems, both forms (linear and rhizomatic) co-exist in harmony (Deleuze & Guattari, 1987):

There are knots of arborescence in rhizomes and rhizomatic offshoots in roots. Moreover, there are despotic formations of immanence and channelization specific to rhizomes, just as there are anarchic deformations in the transcendent system of trees, aerial roots, and subterranean stems. The important point is that the root-tree and canal-rhizome are not two opposed models [p. 20].

Teaching can be designed and performed in such a way to allow for differentiation, to allow for emergence, and to catalyze the flourishing of learning rhizomes. Central educational design is not useless. As an organizational form, the hierarchical tree structure is ubiquitous in nature and becomes a life-promoting factor when, in its operation, it becomes an organic part of a broader rhizome. Formal education can be thought of as an eloquent dance between design and emergence: designed enough to allow for emergence.

3.4 Rhizomatic Performances and New Empiricisms

The ontological turn refers to the idea that different social groups, as well as different scientific communities, operate in radically different worlds. That is, there is not one world out there and just many interpretations, perceptions or constructions of it, but different worlds per se that coexist (Zembylas, 2017). In this conception, a world can be realized as any confluence (Gergen, 2009) of performative entities, both organic and inorganic, a rhizomatic entanglement that is always in the becoming, through a decentralized dance of actions (Pickering, 1995, 2017). The ontological turn has unavoidable epistemological implications. While knowledge as a fair representation of a unique external reality imposes a true/false dichotomy, research as participation in a co-evolving rhizome does not. After all, although we import our preferred performances in any relational confluence (Gergen, 2009), "who knows where dances of agency can take us? we just have to look and find out." (Pickering, 2017, p. 137) We can only experience and (re)present the experience of participating in such confluence of performative actions. If knowledge as a representation of a unique real world calls for accurate and therefore inevitable predictions, ontological turn calls for co-creating the futures we desire.

The ontological turn moves the focus from a supposed objective representation of the external reality to the performative processes in the rhizome of active living agents and material objects that are interrelated, co-determined, transformed, entangled, and always in the becoming. Thus, the ontological turn prefers a methodological culture that is less mimetic (representational) and more poietic (performative) (Doll, 2006). Unpredictability, irreversibility (the arrow of time) (Prigogine & Stengers, 1997), and complex causality of living processes advocate toward a performative rather than a representational epistemological view. As St. Pierre (2016) concludes:

At this point, I refuse the concepts method and methodology as they are used in most empirical educational research. That means I also refuse the empiricisms that enable those methods and methodologies. This ontological turn, which does not assume that to be is to know, demands a different empiricism [p. 29].

A different empiricism that celebrates unpredictability, creativity, serendipity and transformative performances in the research adventure.

When one comparatively looks at representational and performative approaches, the question is not which of the two is more valid, a question that in any way can be answered only in the representational realm, but rather what kind of consequences each approach produces. Methodological traditions "are there to stimulate, to be drawn on and utilized, to

be adapted in context; they are not there to be followed slavishly. The use of methodology should never become methodolatry." (Chamberlain, 2012, p. 62) This is about a performative and rhizomatic epistemology, "a vision of knowledge as part of performance rather than as an external controller of it." (Pickering, 2010, p. 25) In this way, we can turn research practice from an industrial machine, a Newtonian automaton that produces only predefined products, into a place for dreaming (Jandrić & Kuzmanić, 2020), a place that celebrates creativity and anotropy (negentropy) (Polemi-Todoulou, 2018), and a place that prioritizes the well-being of the communities involved (Arko-Achemfuor, Romm, & Serolong, 2019).

4 Final thoughts

We have heard of this before so many times: the whole is greater than the sum. The learning rhizome demonstrates emergent properties as the byproduct of the complex synergies developed. This does not mean there is no room left for personal agency, creativity, and exploration. On the contrary, the rhizome's innovative power rests upon the people's freedom to express themselves and to take advantage of their life-promoting diversity. A living rhizome can be an amplifier of personal action and a multiplier of members' perspectives. Also, the rhizome creates the background, the contextual validity, and the situated meaning for individual actions. Nevertheless, the rhizome as a whole can: "inform a learning organization which is capable of self-organization and transformative change under hyper-turbulent conditions." (van Eijnatten & Putnik, 2004, p. 415)

The Anthropocene era brings unforeseen challenges that threaten the very existence of life on this planet and cause suffering to a plethora of living forms, human and non-human (Brailas, Koskinas, et al., 2017). The Robotocene era brings unprecedented social dynamics, with artificial intelligence becoming part of decisions that shape human life and lived experience. How to work effectively and thrive in rhizomes is something that should be cultivated and practiced in formal education. We need to learn how to build learning organizations able to cope with unprecedented challenges and able to serve life in all its forms. We have to rediscover the Aesopian idea of *united we stand, divided we fall*. But with a new way of being united, not as oppressive collectivism, but as liberating togetherness. This is about a collective intelligence that rises to serve members' creativity, autonomy, and personal flourishing *through and for interdependence* (Polychroni, Gournas, & Sakkas, 2008; Vassiliou & Vassiliou, 1982). Only when each and every participant feels free to speak up and share their own opinion, even if it is contrary to the prevalent one, will group-as-a-whole become greater than the sum of its parts. Otherwise, opinion silos and echo chambers come to the foreground (Brailas et al., 2018). In the intelligent group, nobody has the right to impose their opinion, and everybody should feel free to express their own. Therefore, the emergence in a group is catalyzed by what we call enabling constraints (Davis, Sumara, & Luce-Kapler, 2015). Enabling constraints are complex processes that are simultaneously rule-bounded (by negotiating norms that create a safe ground for experimentation), and rule-breaking (by allowing for creative experimentation within an

appreciative rhizomatic culture). This will allow for an educational intervention that is *designed enough to allow for emergence*. The role of the educator is critical in catalyzing the whole process, as a gardener that creates the optimal conditions for flourishing without actually doing the flourishing, which is the flower's job.

In this paper, we defined rhizomatic learning as the process of extending, nurturing, cultivating, and catalyzing the development of a living network, consisting of knowledgeable agents, both human and artificial, and material objects/resources. According to Heinz von Foerster (von Foerster, 2003), there are "two fundamentally different epistemological, even ethical, positions where one considers oneself: on the one hand, as an independent observer who watches the world go by; or on the other hand, as a participant actor in the circularity of human relations" [p. 303]. Anotropy (negentropy) is the ability of living systems to increase their internal organization and evolve, against entropy, and the second law of thermodynamics (Prigogine, 2003; Prigogine & Stengers, 1997). By developing learning rhizomes, self-organizing confluences of human and non-human in the becoming, we participate in anotropic performative dances which help us unfold our full living potential.

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