

Preparing for a Confusing Future

Complexity, Warm Data and Education

Nora Bateson, Sept 2018

*Humpty Dumpty sat on a wall
Humpty Dumpty had a great fall
All the king's horses and all the king's men
Couldn't put Humpty together again.*

-Lewis Carroll, Through the Looking Glass

Putting the world back together now from the fragmented, decontextualized and siloed bits it has been broken into is a challenge that rests on the possibility of intergenerational collaborative exploration. To form and find interconnections will require humility and a new kind of attention to interdependent processes in complex systems. New sensitivity will be needed, new perception, new language, new ideas. If the human species is to continue, the way in which we consider ourselves in relation to each other, and the environment must evolve.

Imagine for a moment what it must be like to be a child in this era – looking into the future, what awaits you?

Those of us who are over 25 probably cannot actually conceptualize the horizon that is in view for today's kids. When they are asked, "What do you want to be when you grow up?" – what should they say? What are the current options? A programmer, a doctor, crypto-broker, an artist, a YouTube star, an ocean restorer? What kind of society will they be living in? And, what sort of education can they be given to prepare them for a future we cannot even imagine? More than an exploration of education, this is a recognition that the education system exists within and between other systems of employment, economics, culture, media, health, religion and within the larger ecology. To discuss changes in the education system so that it might better serve the citizens of tomorrow is to discuss system change across multiple sectors, nothing else will do.

All the generations that are alive today are witnesses to the rapid transformation of these institutional and ecological contexts of daily life, a trend that is predicted only to accelerate in coming decades. It is hard to say whether the young or the old will be the more able to navigate through the storm of system change. The older folks may experience greater difficulty in the changes, having become more

ossified in the obsolete structures of socio-economic culture. But, the younger people do not have the same depth or scope of experience to draw from. It is absurd how often so-called inspirational talks are given to young audiences that call on them to solve the problems their ancestors have left for them. The generations need each other, if there is any hope at all it is the relationship between generations, cultures, classes, and even species.

Education change is system change.

For the last several centuries, perhaps much longer, the most dominant way of making sense of the world (especially in Western cultures) has been to break it into parts and examine their details, and then try to figure out how those parts fit together. This has become a tactic of sense making that permeates every context of human life, from farming to law, and from economy to medicine. This form of sense making has given us a particular kind of knowledge, and know-how. By taking subjects out of their complexity and studying them as separate it has been possible to isolate the pieces of the puzzle of life. The conceptual model trains to perceive causation through a mechanistic lens of parts that are fitted together. Seldom have those pieces been returned to the contextual complexity from which they originated and studied as relational process. Schools have replicated this division by separating subjects. The quest for causality, precision in definition and measurable outcomes has served innovation of industry and science in ways our ancestors could never have dreamt of.

“...the systems involved in education, including the education system itself, the political system, the economic system, and the social system, are not particularly known for being able to adapt or change quickly. In fact, these systems are resistant to change. All of these systems are deeply intertwined and interdependent that any attempt to change in one will require massive changes in all of the others.”

-Jeff Bloom

There is not enough time to educate 8 billion people in complexity theory. And yet, a widespread understanding of interdependency between ecology, culture and individual well-being is necessary to ignite the collective of the humanity toward new ways of living. There is a critical need to recognize that from agriculture, to economy, to gender equality, to the health of the oceans and ending poverty, every meal is an inter-systemic example of the choice between continuance of either survival of our species or business as usual. However, now it is clear that the most grave crises facing present and future generations are the consequences of reductionism of complex systems. The vitality of living systems is found in their interrelationships. Compartmentalized and specialized knowledge has been rewarded, while an understanding of larger contextual process has been dismissed as un-measurable, unpredictable, and impossible.

Ask old Humpty, walls are a bad idea – things get broken and cannot be repaired.

The survival of the human race is now contingent upon collective comprehension of the interdependency that exists between organisms, in all their systems, humans and their technological toys included. Ideally this shift in mind-set would be taken up by education programs.

“Our assumptions about nature are based on what we see around us but, what we often see, especially from the cities that have dominated our culture for thousands of years, are the influences of our presence on the world. This can create false, yet deeply rooted assumptions about nature. Because of these inaccurate assumptions, our actions often produce results we do not intend.”- Paul Krafel, *Seeing Nature* (pp 6)

The ecology of the environment has been reduced to departments, unable to be seen in its complex interdependency. In response, climate science has tried for decades to produce compelling facts that would inspire policy makers and citizens to make different choices. In this sense, there has been an attempt to ‘educate’ the public. But the science has not taken hold in the culture. The many undercurrents of contextual reconfirmation around life as status quo are not so easily convinced. As one friend asked rhetorically, “what would happen if you asked a university to build a jungle?” You would get a flora department, a fauna department, an insect department, a soil department, a reptiles department and so on. But a jungle is only possible in the way all of those organisms live together.

Now, in order to live differently, new perception is necessary. New communication that can hold the non-linear processes of interdependency in living systems will be a baseline for developing new forms of socio-cultural community. What sort of an education system can do that? One that is not just an education system, but one that includes the many systems of society.

Systemic and inter-systemic change is needed to form a context within which education can change. It is ineffective to strive for substantive changes in the structure and outcomes of educational programs without addressing the need for larger societal change to welcome the newly “educated” students. Right now employment is contingent on particular educational prerequisites that prime incomers. Some of this education is direct vocational certification, but there are also the meta-messages of school and the way they set up relationships with authority. However, the reverse is also true. There is no way to make shifts in socio-cultural systems without first making them in education. There is a loop here that it is easy to get caught in. Where should the change-making originate? In the schools? Or in the culture?

To get unbroken a breakthrough is needed. Systems change will require much more than curriculum change, but it cannot be done without a deep shift in the institution of education. It will require a transcontextual understanding of how life is. The compartments and silos of education desperately need to be informed by their as yet unfound, un-named connective tissue. There is no crime in pulling the world apart to make sense of it, but there is a crime in not putting it back, and at least making some attempt to understand the contexts, processes, and interrelationality that give complex systems their vitality.

So many mistakes have been made by finding solutions to situations that have been decontextualized. The consequences are everywhere. Experts making professional analysis and assessment from which to take action are doing so without enough contextual information. Specialization continues to make it increasingly difficult for scholars to venture out of their field and contribute to this space between subjects. Is this a crisis of education? Or of culture? How can a school-like institution help to provide this connective tissue? Tradition in any form is hard to reshape. The separation between the disciplines is hardwired into academic structure, which is a particularly rigid institution further held in place by the economic and cultural systems around it.

Systems & Complexity Education:

Education about systems & complexity is not the same as education *within* systems and complexity.

There is an encouraging new wave of systems-based education curriculum emerging. Peter Senge and has brought focus to this subject matter to schools internationally. The adult world that has become versed in the existing scholarship around systems theory has also brought a collection of models, vocabulary and metaphors to explain and define what may at first seem to be an abstract set of ideas. While these models are useful for now, I would like to caution against solidifying their position in the curriculum. There is the realm of direct transmission of knowledge about systems, and then there is also the possibility of indirect experience within systems. Both are necessary. The irony that an education thread of “systemic knowledge” can all too easily become another subject in the curriculum, when what is needed is a liminal realm for the other subjects to be de-separated. David Christian has had some success with this in the Big History curriculum which reaches around all sorts of stories of life, culture, science, art and technology.

Systems education is a way of seeing the world and responding to it. Translating the world into systems terminology is only necessary when the surrounding culture is still based in more mechanistic thinking. As time progresses students will no doubt prove to be much more comfortable and adept and working with systemic principals than most of the adults who supervise them. Entering and playing with patterns of interaction that mimic those of ecological interaction provides new ways of making connections. Some technologies are beginning to explore this sort of patterning of communication. While there is an exciting opening in interactive patterns in blockchain, I am still cautious. I perceive the place of technology as precarious; delivering both new kinds of connection to each other and the world, and dangerous disconnection simultaneously. There are some things we cannot learn about life from machines.

There is a long history of cybernetics, systems theory and complexity theory to be aware of. Much of it is beautiful and filled with remarkable pioneers. However at the Macy Conference (1950's some of the earliest models that were used to

challenge the causal thinking patterns were machine based. Consequently there are residual ideas of mechanism even within systemic approaches.. “Solving for pattern” has been a system-thinking response to the hold-over demand for solutions. But now, the systems are changing fast, and trying to get a handle on patterns in nature, culture or the flow of ideas is going to be harder than it might have been a few decades ago. Climate change, the rise of right wing nationalism, and communications patterns of new technologies are good examples of the moving landscape. The patterns to study now are patterns of change. It is a tricky time to enter the study of relational process, just as the rhythms and cycles are becoming more unpredictable.

Allowing students to play with their perception and description beyond the existing forms of expertise is a way open the channels of new findings. One interesting example of a classroom engaged in ecological thinking that I witnessed was a study of food in which the students, (who were preschoolers) were asked to draw the smell of the plant that sat on their table. The plant was fresh basil, but the kids were not aware of the name of it. Remarkably without hesitation they set to the task of drawing the scent of basil. In doing so the adults in the room were privileged to an experience of basil that they, already familiar with a particular set of descriptions and experiences of basil, were not able to have. The students also used beads and blocks to describe the taste of oranges. These cross-sensory explorations offer profound insights into relational information.

To study the tango, a student must first know what the tango dance and music are. Then, when the steps are dissected into parts, they are still considered within the cohesion of the whole dance. Contextual knowledge gives a scaffolding to build detail into, but decontextualized details lack life.

“If you want to build a ship, don’t drum up the men to gather wood, divide the work, and give orders. Instead, teach them to yearn for the vast and endless sea.”
— Antoine de Saint-Exupéry

Warm Data:

What is knowledge, information, and data? And how might an education facility provide the conditions through which new forms of information can be explored?

“Recognizing that complex problems are not susceptible to predetermined solutions, the International Bateson Institute has taken up the task of generating a category of information specifically dedicated to description of contextual relational interaction, calling it “Warm Data”. The units of knowledge by which reasoning and calculations are made namely, data, information, and facts, suggest processes of research into which we place our hopes for better understanding of the world we inhabit. But the subject being perceived must dictate the necessity of understanding in different ways, therefore producing different kinds of information. Warm data is the product of a form of study specifically concentrated on (trans)contextual understanding of complex

systems. Utilizing information obtained through a subject's removal from context and frozen in time can create error when working with complex (living) systems. Warm data presents another order of exploration in the process of discerning vital contextual interrelationships, and another species of information." – N. Bateson *"Warm Data"*

"Warm Data" can be defined as: Transcontextual information about the interrelationships that integrate a complex system.

Because so many of the challenges that we face now are complex, we need approaches to meeting that complexity. Although there is a desire to reframe these complex issues in simple terms that might lend themselves to easy solutions, this usually leads to the dangers of unintended consequences of reductionism.

Thinking in complexity requires the ability to perceive across multiple perspectives and contexts. This is not a muscle that has been trained into us in school or in the work world. It is a skill acutely needed in this era to meet our personal, professional and collective need to respond to crisis, and to improve our lives.

The theory of Warm Data is useful to connect the subjects and bring the complexity to life. What if there was a time between classes to study the liminal realms? What if time were given to support students' discovery of abductive process and pattern finding across subjects.. To do so is to demand that perspective be revealed, who is the observer? And to utilize the differences between framings to generate the relational information (Warm Data) between them. Contradictions will emerge, along with paradoxes and cultural limits. Warm data is a study of living systems that are in constant response and calibration to many relational processes. Life changes with the passage of time and with point of view; Warm Data a form of information to accommodate that complexity, and put the world back together.

What are the similarities between history and algebra? This sort of connection may be unusual at first to consider, but not impossible. Both require that students think in terms of variables. And what can be noticed about the connections between Shakespeare and science? What do those subjects share? As a study in how the world is understood and described students can source deep but different knowledge from both Shakespeare and science. Perhaps they are not often combined, but surely they are related. There—in the warm data of our interactions is where entirely unanticipated possibilities are to be found.

In her book, *Braiding Sweetgrass* Kimmerer provides a multiple versioned description of botanicals. As such the plants carry story, history, culture, art and science simultaneously. The result is a kind of comprehension of the grass that is not located in any of the particular forms of description, but is somehow in between them.

"I could hand you a braid of sweetgrass, as thick and shining as the plait that hung down my grandmother's back. But it is not mine to give, nor yours to take. Wiingaashk belongs to herself. So I offer in its place a braid of storied meant to heal our relationship with the world. This braid is woven from three strands; indigenous ways of knowing, scientific knowledge, and the story of an Anishinabekwe scientist trying to bring them together in service of what matters most."

– Robin Wall Kimmerer Braiding Sweetgrass

Transcontextual:

The change that is sought now is going to require an understanding and familiarity with the way in which multiple contexts interrelate. The term 'transcontextual' has been useful toward this description of the processes that both holds the current systems of life in place, and ironically, how they change. I found this term in the double bind section of Gregory Bateson's (my father) book, *Steps to an Ecology of Mind*. Recognizing that complex systems never exist in just one context, but many. The relational processes that occur in each context are different, but they are also not isolatable from each other. A tree for example is in relationship to the micro-bacteria in the soil, the other trees around it, the shadows, wind, water flows, populations of insects in its bark, the birds, human interaction, its own genetic history and so on. Each of these contexts is comprised of a realm of interaction through which the tree is in ongoing formation. Is it a crooked tree, a scrawny tree, a leaning tree? The transcontextual description of the tree begins to reveal how it is learning to be in its world. To describe education through a transcontextual lens is to begin to allow the many contexts within education to surface and co-exist.

In 2016, I wrote a blog post entitled, "A list of relevant questions". This post addressed the current crises of the globe, taking into account the complexity of inter-systemic entanglement. I will borrow from that post to illustrate the transcontextual overlapping system change, with education in mind. With this transcontextual approach I hope to show the system of systems upon which the institution and idea of education is interdependent.

The relevant questions I posed were listed by institution and, in hopes of generating some warm data between them, I have addressed an incomplete association around how education is related to each of these contexts. My hope is that by laying it out like this, the reader's own connections and linkings or Warm Data – will begin to emerge in the form of ideas, memories, and recalibrating understanding of interdependency:

Education: *How can we best cultivate curiosity, information, and learning between generations to prepare ourselves to perceive and respond to the complexity of our world with less destruction than centuries past?*

The school system as it stands is the source of authorized sense-making of the surrounding world. It is where the language of the culture, the hierarchies in culture, the psychology of the culture is spoon fed to the coming generations. It is also where the findings of past generations are shared, where the fire of curiosity

is both lit and extinguished. Education could be a time to think about what ideas, and capacities are useful in the world, and how to enhance the body, mind and imagination in those directions.

***Health:** How can we support health in human beings by making it possible for each person to eat healthy food, sleep well, know that their families are supported, be respected in their community, have relevant contributions (education and employment), breathe clean air, and drink clean water?*

How many people struggle with not fitting in at school and carry that notion of isolation into adulthood, only to have it manifest as addiction, depression, aggression or other harm for their entire lives? Education and success in education is often a precursor to confidence and ability to thrive in society. The rise in numbers of children who are receiving prescription drugs to increase classroom success is correlated with rising addiction and suicide of university students. Ability to perceive and respond to connection in life at all levels is an important contributor to a sense of belonging, not only in society but within the biosphere.

As preparation for their future what can an education program do to tend to the brokenness of the students? In so doing, can such a learning environment give strength to students' capacity to attend to each other and their communities? The work of the coming decades is not the work of manufacturing, engineering, or of retail sales, it is the work of caring. Caring for each other and the biosphere. In that care there is the hope of finding new sources of our own vitality as an antidote to competition and thick-skinned cruelty. The 'my' in my health is not mine; rather it is a consequence of my microbiome, my family, my community, and the biosphere being cared for. The work ahead is not clear or clean. It requires intense integrity, patience in ambiguity, fierce dedication, raw vulnerability, bleeding humility, and the poetry of explorers. Can a classroom offer that?

***Ecology:** How can we interface with the complexity of our natural world so as to create less harm to the interdependence of all living things?*

There is an urgent need for an education system that offers the conditions through which perception of the complexity of the environment, as well as each other is possible. It is a mistake to think that young children cannot see or work with complexity. In fact, they tend to be better at it than most adults. The Reggio Emilia school program runs the classroom for very young, (3-5 years old) with a process that shows remarkable ability to recognize patterns in multiple contexts and to articulate relational information about the patterns through multiple expressions, both art and verbal.

Education that takes place in nature stimulates entirely different sets of cognitive processes. Wilderness as a classroom is the original laboratory, playground and library of organisms in interaction.

***Economy:** How can we shift the economic system so that it is not based upon exploitation of nature and humanity –without crashing the globe into chaos? (note: no one gets rich on this version of economy)*

At present it is not safe for a parent to encourage their children to prepare for a life in which they are not able to be breadwinners. The response to this need is the pressure in the classroom which forces education into competition, testing, aptitude measurement, and a general feeding system into employment. Yet, in order to perceive and respond to complexity the most needed skill is collaboration. There are many groups now working furiously to help implement new structures for economic exchange. Circle economy, sharing economy, holo and blockchain economies are a few. If education is a process of preparation for taking part in society, how shall students prepare for an economic system that is not yet declared, let alone implemented? Proficiency in adjusting and adapting to a changing form of currency is a start. If extraction and exploitation become impossible to continue the entire basis of profit and markets will be disrupted. What will be the skills that will be relevant in such a society? While this may seem far fetched it is also worth considering.

***Politics:** How do we get the policy makers of our world to mandate cross-sector information for their decision-making processes so that they have the possibility of taking into account complexity?*

What is learned about social engagement and responsibility in school? With the rise of populism in the theater of international politics in recent years, it has become apparent that there is a need for a citizen base that demands more than binary positions. The will of the people, if it is to have meaning in democratic process in the coming years, needs to be informed at a deeper level. Education of concepts such as complexity and transcontextuality will help encourage a more demanding population. As it stands the political bodies are unable to veer from platforms of rhetoric that repeat reductionist versions of important, and even life endangering issues that require complexity to meet. The polarity charged up by increased divisions of dualistic positions is a recipe for dictatorship, violence and destruction.

Urgency and emergency tend to narrow the capacity for complex thinking, and yet, ironically the crises that are ahead of the coming generations will require nothing less. The task is therefore twice as urgent and twice as difficult. Relational and contextual information must be provided in educational programs so that students have the chance to make the connections necessary and seek politicians that are capable of steering the discourse of international agreements, and actions around new economies, ecological preservation, and humanitarian law.

***Media:** How do we get a moratorium on binaries? How do we support public understanding, not trained in perceiving complexity, to become accustomed to it and demand communications institutions deliver cross-contextual information?*

It has become cliché to drone on about the saturation of social media, big data and the way children are manipulated by these communication technologies. The more important question may be how to provide them with the suspicion and careful criticism to keep from getting caught in particular algorithmic echo chambers of click bait. Being responsible surfers of the landmine of tricky and often hacked stories online is not easy at any age.

The press also has a responsibility to assist in the project of informing the public about the complexity that the crises of current limits in perception have brought upon us. Unfortunately, it is hard to sell journalism that addresses complexity. The much easier sell is the story of adversaries, controversy and polarization. While it is not clear whether the current narrowness of the stories that get run are the fault of journalists or the fault of their audience, the situation has got to change. Fake news, corrupt research, tainted studies, and stilted stories are perforating the public's trust in any media. A more systemic approach with more perspectives might present another form of inquiry to engage the public in new ways. But this requires an audience that has an appetite for more substantial, rigorous information. It is a circular problem. Lives are at stake. As millions of refugees are fleeing ecological and political disaster, climate conditions become increasingly extreme, the wealth gap is widening, the interlinkings between these stories is critical to the development of public opinion.

What stories are we living in? There is a great deal of attention placed on cultural narrative and the possibility of instigating change through changing narratives... I see one of those shifts as the shift from binary to complex storytelling.

***Culture:** What is the approach to open the global discussion about the pending fate of humanity? What matters? What are we willing change? How can we survive together?*

The deep metaphors that run through the culture inform the collective in ways that are so entrained they are hardly visible. Presumptions of authority, dominance, status, even the notion of what health and happiness look like are culturally scripted into daily life. School, business, medical care, politics, media and identity are marinated in cultural patterns and signals. What is courteous behavior, what is indecent? How to show respect? How to be respected... all of these communications exist in subtle conveyances that are built into education. The education that students receive in the classroom is only partially located in the direct teachings of the subject. A great deal of indirect learning is taking place about how to be a good student, how to succeed in the culture, how to be liked and so on. Students are influenced by what they are taught but also by what they are NOT taught in school such as insidious messages of white supremacy due to exclusion of historical events and movements, as well as a lack of historical figures of color.

The idea that there are right and wrong answers is a cultural binary that undermines inquiry of complexity and problem solving through out every sector

of society. Misunderstood complexity often results in an ill-informed need for solutions, strategies, concrete deliverables, and other products of linear thinking. This approach is further confusing those in need of grasping complex circumstances. Decisions and actions that are effective in complex situations are characterized by resilience, multiple approaches, and non-linear action. These are the more useful outcomes for future visionaries.

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How to make sense of the world.

The double bind of this era is that continuance of our species requires discontinuance of current means of survival. Business as usual is a swift endgame. Yet the rent must be paid, and breakfast must be possible. To live through next week is to take part in systems that are destructive to the future.

*“In a word, conservatism is rooted in coherence and compatibility and these go along with what, above, I called rigor in the mental process. It is here we must look for the roots of obsolescences. And the paradox or dilemma which perplexes and dismays when we contemplate correcting or fighting against obsolescence is simply the fear we must lose coherence and clarity and compatibility and even sanity, if we let go of the obsolete.” (Bateson, *Mind and Nature* pp 207)*

The old metaphors of launching and landing are aptly accompanied by the new media term “extreme weather”. Talk of climate crises, racial supremacy, sexual assault, economic disaster and corporate corruption are swirling around every social media outlet, and every conversation. “The sky is falling” used to be a hyperbole of cartoon proportions, a moralized message of super-paranoia—now it is the daily news. What is it to be young in a moment when the shared vision of the future is filled with upheaval? What dreams, what stories, what forecasting can children today hold on to? Will they follow the path of the generations before? Go to school, get a degree, get a job, buy a little real estate, meet someone to love, have babies, grow old, get a pension? Anyone who is paying attention (and kids do pay attention), will have noticed that it is more than likely that none of the steps in that progression from childhood to social citizen are going to be viable, let alone relevant to the children of today. As adults, as parents, as teachers, as community what can be offered to the coming generations. How shall we prepare them, how shall we guide their days, what shall we feed them at the table of ideas? This is a non-trivial question upon which the entire premise of intergenerational interaction is contingent.

The essence of this question is human evolution. What is really being asked here is “How can the older generations assist in the process of the coming generations making sense of their world?” While every generation has asked that question, the stakes of today are presenting new dilemmas. Business as usual is not an option for anyone now. The socio-economic patterns that hold day to day life in place now are the same patterns that are continuing to reward exploitation and

extraction of humanity and the biosphere. Not long ago it may have seemed reasonable to train upcoming waves of students to succeed within current structures of business, medicine, politics and other possible career choices. Now it is quite clear that larger systems-change is at hand, and the more ready any of us can be, the better. But schools are still producing graduates ready to partake in a world of employment, governance and status that is hitched to extraction and exploitation. At least some students are starting to wonder what the point is of such an education. They want to contribute to a new way of living, but those tools are not so easily found in education systems. For them, taking part in the existing system is furthering the destruction they are already shouldering and is seen as adding insult to injury. Yet, the march forward continues and every year parents are proud to pay vast sums to enter their children into the world's notable universities. I am one of them.

To look around the world today is to notice that so far the adults at the helm have failed to give necessary care to the interdependency of life. The urgency of tending to relational process has been either too time consuming, expensive or abstract to make it to the board room of most organizations and institutions. Given the lack of change toward systems of exploitation in past decades one has to wonder if older generations have enough existing knowledge and understanding of complexity to sufficiently 'teach' it to their students. Somehow education of complexity must take place through a new kind of interaction in which students can find their way into new applications of complexity that their teachers will be totally unfamiliar with.

Not only that, but the swirl of systemic process that the next generation must be adept within, is characterized by uncertainty, ambiguity and moving relational blur that has no right or wrong answers. It will be impossible to test them on this material, and if they were tested the likelihood is that the faculty would not be able to keep up. Another way of putting this is that since the older generations are not proficient enough at complexity the best thing that can be done is to create an environment for this generative study and then get out of the way.

If there is a real effort to stop living in continuing exploitative and destructive ways it will take nothing short of total mind-set change to get there. How can we think about what we don't know we are not thinking about? Helping increase each others' insight is perhaps the most that can be hoped for. There are paradoxes like mazes to work through to find ways out of our epistemological traps. Getting out of old scripts, presuppositions and habituated thinking patterns is no joke. Like Wittgenstien's flies in the bottle, we cannot see the traps we are in. The most concerted and heartfelt efforts to do things differently often end up being repeats of the old ways with slightly different vocabulary. A few starlings in a murmuration will have a very hard time changing the movement of the group. They will have to be out of sync, and it is incredibly difficult to actually get out of the contexts that roll us from one day to the next. The pull is strong to stay in the flow of the many existing rhythms. Fissures, and confusion are needed. Art is especially needed, and, to be around people that do not see things as we do. We need curiosity, but we also need adventure, humor and most of all willingness to feel the pain of loss. There is numbness that has come with the

centuries of destructive behavior that lie underneath the (western) education system. Sensitizing anew is like fish learning to fly, and it may seem impossible at first.

"When I was your age, I always did it for half-an-hour a day. Why, sometimes I've believed as many as six impossible things before breakfast." -The Queen, in *Through the Looking Glass*, Lewis Carroll.

Citations:

Carroll, Lewis, and John Tenniel. *Alice's Adventures in Wonderland and through the Looking Glass: By Lewis Carroll*. New York, NY: Choice Pub., 1989.

Bateson, Gregory. *Mind and Nature: A Necessary Unity*. Cresskill, NJ: Hampton Press, 2002.

Bateson, Gregory. *Mind and Nature: A Necessary Unity*. Cresskill, NJ: Hampton Press, 2002.

Bateson, Nora. *Small Arcs of Larger Circles: Framing through Other Patterns*. Place of Publication Not Identified: Triarchy Pr, 2016.

Bateson, Nora. "Warm Data." Norabateson. May 28, 2017. Accessed September 20, 2018. <https://norabateson.wordpress.com/2017/05/28/warm->

Bateson, Nora. "A List of Relevant Questions." Norabateson. January 18, 2017. Accessed September 20, 2018. <https://norabateson.wordpress.com/2017/01/18/a-list-of-relevant-questions/>.

"Jeff Bloom's Blog." Jeff Bloom's Blog. Accessed September 20, 2018. <http://blog.jeffbloom.net/>.

Krafel, Paul. *Seeing Nature: Deliberate Encounters with the Visible World*. White River Junction, VT: Chelsea Green Pub., 1999.

Abbott, Lesley, and Cathy Nutbrown. *Experiencing Reggio Emilia: Implications for Pre School Provision*. Berkshire: Open University Press, 2010.

"Holochain." Holochain. Accessed September 20, 2018. <https://holochain.org/data/>. Goleman, Daniel, and Peter M. Senge. *The Triple Focus: A New Approach to Education*. Florence, MA: More Than Sound, 2015. Christian, David. *Big History*. NY, NY: DK Publishing, 2016.

Kimmerer, Robin Wall. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. Minneapolis: Milkweed Editions, 2015.