7Cs in the Anthropocene: Underpinnings, Processes, Practices of Moving Toward Creative Confidence in All We Humans Do in the Anthropocene

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7CS IN THE ANTHROPOCENE:

UNDERPINNINGS, PROCESSES, PRACTICES OF MOVING TOWARD CREATIVE CONFIDENCE IN ALL WE HUMANS DO IN THE ANTHROPOCENE.

DEBORAH FORBES

A commentary in partial fulfillment of requirements of the University of Westminster for the degree of Doctor of Philosophy by Published Work.

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Figure 1. Text (Forbes, 2022) over Detonation of the Trinity atomic device at Alamogordo, New Mexico on 16 July 1945, introducing the Anthropocene (Waters, 2016).

As a Canadian settler descendant, I honour and acknowledge that I am situated on Treaty 7, and neighbour to Treaty 4 territory, treaties imposed on Indigenous lands by the Canadian Government, on traditional lands of the Siksika (Blackfoot), Kainai (Blood), Piikani (Peigan), Stoney-Nakoda, and Tsuut'ina (Sarcee) as well as the Cree, Sioux, and the Saulteaux bands of the Ojibwa peoples. I also honour and acknowledge that I am on the homelands of the Métis Nation within Regions II and III. I acknowledge all the many First Nations, Métis, and Inuit whose footsteps have marked these lands for centuries and will continue to in the present and future. I am committed to Truth and Reconciliation in thought, word, and action.

Table of Contents

Abstract

This commentary seeks to bridge a gap in methodologies, and hence methods, for building creative confidence in the Anthropocene period. As I will discuss in my commentary, creative confidence includes the abilities to define and solve problems in new ways, to think and explore expansively, to create and build. Throughout my extensive career as an artist and college instructor/lecturer domains, I have actively explored diverse methodologies to enhance the creative problem-solving abilities of artists, educators, students, and community agencies. Over time, it has become evident that these investigations, using existing methodologies, (e.g. Design Thinking, Universal Design for Learning) predominantly revolve around devising solutions within the confines of human-defined predicaments, often regarding human exceptionalism as the standard in solutions. In a quest for healthier, more productive methods for building creative confidence, to approach solutions to human created problems, I am respectfully continuing to learn about Canadian Indigenous Ways of Knowing. Story, image, lived experience, and particularly circularity and reciprocity, are Canadian Indigenous pathways I am conscientiously traveling along in my ongoing learning journey. The present Anthropocene period unequivocally underscores that the gravest concerns imperiling our planet stem from human actions. Consequently, it becomes imperative to transcend the limitations of human-centric viewpoints. This is the gap that *7Cs in the Anthropocene* seeks to bridge, at a time that our earth deeply needs the workings of creative confidence to help solve the problems of this age.

The six published works and the commentary, elaborate and illustrate the origins and potential of inclusive, circular processes (methods) denoted as the *7Cs* (curiosity, connection, collaboration, complexity, chaos, creativity, courage), rooted in Indigenous methodologies of story and image that I use with care and gratitude, in all my work.

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- Elder Charlie Fox: for telling and retelling trickster stories.
- 8.7 million known animal species on Earth: adapters extraordinaire for being resilient, problem solvers and creative beings.

Author's Declaration

Author's declaration: I declare that all the material contained in this thesis is my own work.

Deborah Forbes www.deborhforbes.com

March 1, 2024

Chapter 1: Background

As I write from the dried beds of the Great Cretaceous Seaway (Western Interior Seaway), Medicine Hat, Alberta, Canada, I sense our Earth's history vibrating through the soles of my feet. I feel the development of life on Earth, evolution, geology, fossilization, and the extraordinary diversity of species ever present. This is the fuel for my work as an installation artist, a college art educator, a community/family literacy activist, a mother, and a grandmother. My growing understandings of the world, with depth of memory and feeling, have been generated from lived experiences; it is these experiences that have positioned my work as an artist and educator.

The published works I am submitting consist of two peer-reviewed book chapters, an exhibition catalogue of an installation exhibition, a video of an installation exhibition, a video of an extended public workshop using one of the installations as provocation, and a full publication. Although somewhat different in form and content, all published works are focused on different aspects of building creative confidence, through practices informed by Indigenous Ways of Knowing, and staying vitally conscious of living in the Anthropocene period. The work is practice-based through making installation artworks and teaching art to university students (who are preparing to be teachers in early childhood to 12th grade settings), developing programs for intergenerational creativity, as well as researching and writing for presentation and publication. Each of the published works will be briefly described in Chapter 4 (p30-44). Published works in full text and videos are present in the attached document Six Published Works.

Challenges to Structural Set-up

As I try to construct a research question, a statement of methodology, and explanation of methods, I am struck with what an uncomfortable fit is such an approach for my work and

purpose. I tell stories and make visual works. I work with others, students, and community members, to further these intentions. I learn from experiences on land and sea, with local Indigenous Elders and Indigenous Ways of Knowing, as well as with conventional academic research. I explore through making things and constructing experiences with others. At this time, I position myself as a Canadian settler ally to Indigenous Canadians, who works very conscientiously to be culturally respectful. I also position myself as an ongoing learner; a constant and humble corrector. I seek to gain deeper understandings of Canadian Indigenous Ways of Knowing, while remaining highly cognizant of what Cash Ahenakew has termed "*grafting*, the act of transplanting [Indigenous] ways of knowing and being, from a context where they emerge naturally to a context where they are artificially implanted" (Ahenakew, 2016, p323). Researcher, Kathy Snow, (2018. p9) writes about complexities of allyship as follows:

> Consistent with Indigenous research paradigms, we can only go so far in learning to be a Settler Ally by consulting the literature on Indigenous methods and guidelines for working with Indigenous community members. Indigenous community members are our strongest teachers.

Jenalee Kluttz, Jude Walker and Pierre Walter (2020), write compellingly about the thorny and ever shifting notions of allyship. They state:

> We came to question our assumptions, became 'un-settled' in our thoughts and identities, experienced emotionally laden disorienting dilemmas, and began to rethink the premises of allyship, both theoretically and in practical terms. We began a transformative process of un-learning and learning, resulting in the 'unsettling' of allyship.

The complexities of allyship Kluttz and colleagues unpack, provoke serious and ongoing thought and feeling for me. Snow's use of capitalized, Settler Ally, seems too firm a designation for my

comfort. For now, I will use lower case letters for settler ally, as indications of a modest, ongoing, and fluid description, rather than a reachable state. The process of decolonizing thought and action is a never-ending state of growth and I expect processes and positionality will modify and adapt over time as I walk alongside in my learning journey.

Colonial studies scholar, Elizabeth Carlson (2017, p3), writes about this dilemma and proposes practices that address:

> … the articulation, grounding, and deployment of an anti-colonial research methodology by a white settler {descendent}scholar. Though developed in the context of a specific project, this approach has much wider relevance and application possibilities. I demonstrate the values and practices of the anti-colonial research methodology to academia generally and settler colonial studies specifically.

I am not an anticolonial scholar, simply an artist and educator who seeks honest and respectful means to learn from Canadian Indigenous Worldviews and Ways of Knowing that I have encountered through lived experiences (see Chapter 2). Highly significant to this work are Carlson's descriptions of methods that are egalitarian/participatory, reciprocal, and wholistic attending to heart, spirit, and body (Carlson, 2016, p6-8).

Carlson (2017, p1) further states, "Eurocentric scholarly hegemony venerates detachment and abstraction." As I will discuss later (see Chapter 3), my approach to building creative confidence lives in the highly *attached* world of chaos from which creative order emerges in the doing; this operates at a far distance from detachment and abstraction; it is empathic and intuitive. Nevertheless, I will construct the research question, methodology, and methods as honestly and respectfully as I can, entering understandings of Indigenous Ways of Knowing, while remaining highly cognizant of "grafting" (Ahenakew, 2016).

Research Question

How can creative confidence be fostered in many settings, with people of many ages, in this, the

Anthropocene period (see Chapter 3)?

How can knowledges of other species help in this journey?

How can Indigenous Ways of Knowing respectfully contribute to understandings?

Rationale: Why This, Why Now?

The question of why approach consolidating my research and many years of lived experiences could be answered in my growing commitment to contribute to meaningful change in how we, as a species, learn and create. Over time, my work as an artist and instructor/lecturer at a small college, Medicine Hat College, on the prairies of Alberta, Canada, has demonstrated that college students are becoming less willing to take creative risks, and want more highly concrete and prescriptive directions on assignments and projects. This mechanistic approach seems to have been increasing over the last ten years. At the same time as I am observing this, I am experiencing expansions in creative confidence in my own art practice. This diminishing of creative risk is also present in my observation of children in kindergarten to Grade 12, in public education settings. Psychologist Keith Sawyer (2019), a leading expert on creativity, innovation and learning, attributes this to 'shallow learning' that many students experience in kindergarten to 12th grade (UK 6th form) educational settings, where: "students don't learn in ways that prepare them to be creative" (Sawyer, 2019, p2). His point is confirmed by creativity researcher Kelly Cederberg, who argues that the ability to come up with novel solutions to society's problems is essential for this time in history:

> Unfortunately, for many of us, our creativity gets culturally suppressed through our educational and life experiences. We get out of practice and eventually believe that we are not creative. If we don't have confidence in our ability to think creatively, we may never come up with the novel solutions to problems that our society and our professions face (2018, np.).

It has been my experience that this is happening at younger and younger ages. Sawyer (2019, p6) notes that creative knowledge is 'deep knowledge' – a conceptual understanding of the basis and

theories of a subject that underlies and provides context to ‘shallow knowledge.’

> In an instructionist school, sad to say, it almost doesn’t matter how hard teachers and the students work. The problem isn’t the people, it’s the pedagogy. Sometimes we assume that if students learn enough shallow knowledge – facts and procedures – that they will gradually combine these small chunks of knowledge to form increasingly complex and deep knowledge. This, however, seldom happens (Sawyer, 2019, p33).

With demands of the changes happening to our earth and beyond in the Anthropocene Epoch (see Chapter 3), nimble, creative confidence to approach challenges yet unforeseen, will be essential for survival of the planet and many species that share it.

Methodology

Proposing a research methodology that is emergent and evolving, that focusses on moving away from human exceptionalism into humility, and moves toward embracing deeper connections with all species, the earth, and the cosmos (past, present, and future), is a powerful stance in addressing the challenges of our time. In the following commentary, I present a methodology that explores how circular systems of practice, avoids sequential and binary discussion, emerges primarily from lived experiences in story and image, that has the potential to foster creative confidence in educational and creative settings. Practices of circularity, reciprocity, and respect are fundamental to Indigenous Ways of Knowing and are manifested in this methodology. Canadian Indigenous Ways of Knowing have been a greatly important influence on the methodology of my work, and for which I am grateful (see Chapter 2). For example, I have seen the mechanisms of humour and laughter as pedagogical tools open the mind and heart to expanded possibilities and have encouraged playful risk, essential pathways to creative confidence. Tomson Highway (2022), Canadian writer and speaker, tells us, “All Canadian Indigenous languages have a trickster; humour and laughter are essential aspects of Indigenous ways of Knowing. The trickster looms large in stories that help us laugh and cry in the face of changes.” As I will demonstrate in this commentary the processes I use in my professional life,

as an artist and college instructor/lecturer have evolved from careful observation, of inventorying in a way, anything in which I, and my collaborators, or students find interest.

'Data,' so to speak, for this research methodology are gathered through story and image using acute listening, reprocessing, story altering in the retelling, and laughter; these are essentials, whether in the college studio, my own studio, or a lecture hall. 'So, what am I looking at?' utilized as a key question, is a phrase that has followed me into all areas of my life.This phrase is individual and group data-gathering; it can take things down to their molecules and into analysis and furtherance that can move from methodology into method.

Many Indigenous Ways of Knowing and understanding, situate story at the very centre of communication and learning. As I argue in depth in Chapter 2, story can be the recounting of an actual event; it could be entirely or partially invented; it can be told in many contexts; it often speaks in voices of other species; it exists to communicate differently to every listener. Cree author, Howard R. Johnson (2022), in *The Power of the Story: On Truth, the Trickster*, and *New Fictions for a New Era* (published posthumously), powerfully shows us how stories shape us in as many ways as there are readers or listeners, as we imagine and create together. Johnson writes:

> All the trees, and the water over there, and all the animals, and the birds, and everything else, and the spirits of this place, are all part of a shared story that we – Indigenous and non-Indigenous alike, are included … we are all part of one big story (2022, p13).

Johnson is making the case that story is empathic; it goes through the teller to the listener and begins to expand from there repeatedly outward and inward.

Method

Rooted in my working processes, and heavily influenced by my understandings of traditional Canadian Indigenous Ways of Knowing, I have evolved a system I title the 7Cs as tools for fostering creative confidence. As I have argued through my work as an artist and educator, (see Methodology) and as outlined in my commentary, transcending the limitations of human centric

viewpoints, and working collaboratively and connectively with other species, can develop innovative and creative methods for addressing new ways of living. This is a gap in practice that *7Cs in the Anthropocene* seeks to bridge (see Bridging a Critical Gap in Creative and Educational Contexts).

7Cs Origin Story… Why?

The 7 Cs (*curiosity, connection, collaboration, creativity, complexity, chaos, courage*) have developed over many years of working in the fishing industry (Canadian Westcoast), and on educational and creative projects in many contexts, with many ages of people (preschool children, Kindergarten to 12 grade, adults, and senior citizens). Initially, there were three (*curiosity, connection, creativity*), which expanded to four when *collaboration* proved to be essential; *complexity* and *chaos* also became vital parts of process, as I will later explain. *Courage* came last to the circle as one needs the impetus to *pause,* take a deep breath, and then act. The process of organic development of the Cs was not quite as orderly as this description. Many of the Cs floated toward me in my early lived experience working at sea, on fishing boats which I explain in more detail in Appendix 1.

Why alphabetical letter C? Initially, the first three words came unbidden and began with the letter C. It seemed as if the C-words were *strange attractors*[1] for more essential C words: Coincidentally, the spoken term 7Cs correlates with the oft used Seven Seas described by NOAA as follows:

> The origins of the phrase 'Seven Seas' can be traced to ancient times. In various cultures at different times in history, the Seven Seas has referred to bodies of water along trade routes, regional bodies of water, or exotic and far-away bodies of water (NOAA, 2023).

In this way, 7Cs open thought and feeling to investigations. Also, the symbol of an open circle (essentially a C) has been used in many Indigenous cultures, particularly American Southwest Hopi Culture. In traditional crafts such as baskets and mats, a circle is not completely closed. In a visit to the Heard Museum in Phoenix, Arizona in the 1980s, I was struck by the power of this symbol; it is always alive in my mind.

Figure 2. In the open circle, there is a reference to stages of life, death, afterlife, and comings and goings of all species at all times. Heard Museum Billie Jane Baguley Library and Archives. https://cdm16286.contentdm.oclc.org/

7Cs, as a construct, seems to be able to be easily remembered by users and seems to be a reasonable name for a circular organization of tools. The C-shaped graphic in an image of the sea, allows the 7Cs to breathe and enjoy fluidity without constraint. The 7Cs, as further explained in Chapter 4, is a viable system others could take up in many different situations.

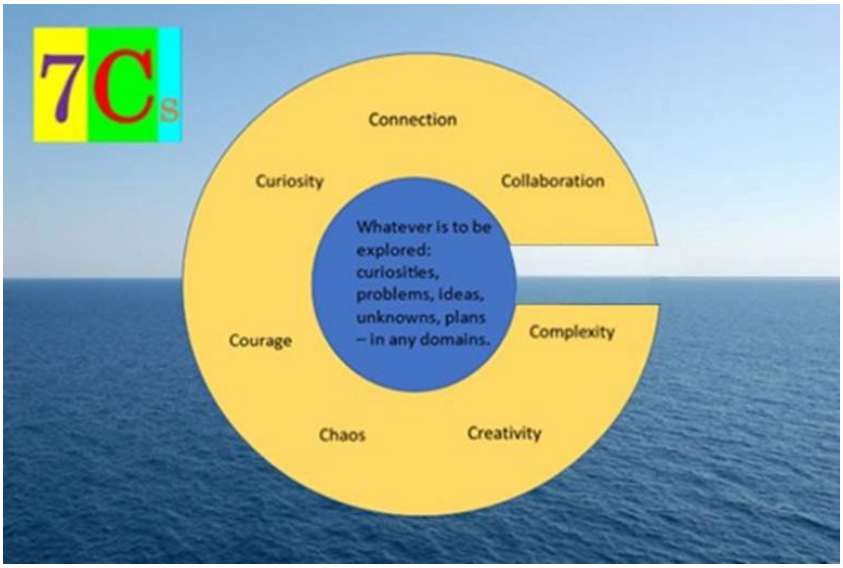

Figure 3: 7Cs (Forbes, 2021).

This document also extends to how the 7Cs have worked in the creation of the six published works that form the basis for this submission for Ph.D. by published works. The submission of the six published works reflects my commitment to invite viewers/readers to engage with my work in ways that are increasingly immersive, empathic, and reciprocal. The art installation exhibitions, book chapters, and the publication invite viewers/readers to encounter the works, in both form and content, in story and image. I substantiate these practices in Appendix 1; the 7Cs developed from my lived experiences on land, primarily the Canadian Prairies, the Pacific Northwest coast, and Canadian Indigenous Ways of Knowing (particularly circularity and reciprocity); these lived experiences purposefully invite other species and natural history into the circle.

The objective of the 7Cs, and my contribution to knowledge in the field of art and education, is to build agile, creative confidence in artists, educators, students. Attempting to integrate circularity and Canadian Indigenous Ways of Knowing from various nations into mainstream postcolonial understandings of the world and cosmos, is a complex and multifaceted endeavor that requires thoughtful and respectful engagement. Alberta Blackfoot writer, Betty Bastien, writes of circularity and reciprocity through,

> embracing storytelling and oral traditions, as valid forms of transmitting knowledge, and opening narratives to convey wisdom and insight, rather than answers and conclusions (2004, p36).

In this way I argue that academic pursuits can be broadened toward wider ranges of thought, engagement, and action. To encourage discussions and decision-making processes that prioritize sustainability of all species and intergenerational well-being can bring us into longer term considerations rather than shorter term fixes. Engaging in critical self-reflection to

challenge Eurocentric[2] westernized paradigms of colonialism[3] and biases in academic and institutional structures, could begin to bring academe out of human centered solutions to human made problems, into a more wholistic view of the world and universe. Hand in hand with the challenge to Eurocentric thinking is a commitment to move out of what Kim et al. (2023) term human exceptionalism (HE), often referred to as anthropocentrism,[4] a conceptual framework, involving the belief that humans and human societies exist independently of the ecosystems in which they are embedded, promoting a sharp ontological boundary between humans and the rest of the natural world. Hayden Washington and colleagues (2021, p286) write, "Anthropocentrism restricts value to human beings, either mostly or entirely. … From a broader, deeper and longer point of view, such an approach to nature underwrites ecocide, whether gradual or sudden, as a result of its failure to recognize and address the natural world in ethical terms." This reasoned stance includes reevaluating the importance placed on quantifiable knowledge and recognizing the value of experiential and community-based knowledge. In this commentary, and in the published works, these concerns underpin inquiry.

The graphic organizer featured below situates each of the Cs equidistantly in relation to a centre and provides some qualities that live with each. It lays out the circular, interrelated territory, in colours that feed each other; there is also room to breathe. In Appendix 2 are graphic organizers for each of the Cs that have colour categories for references.

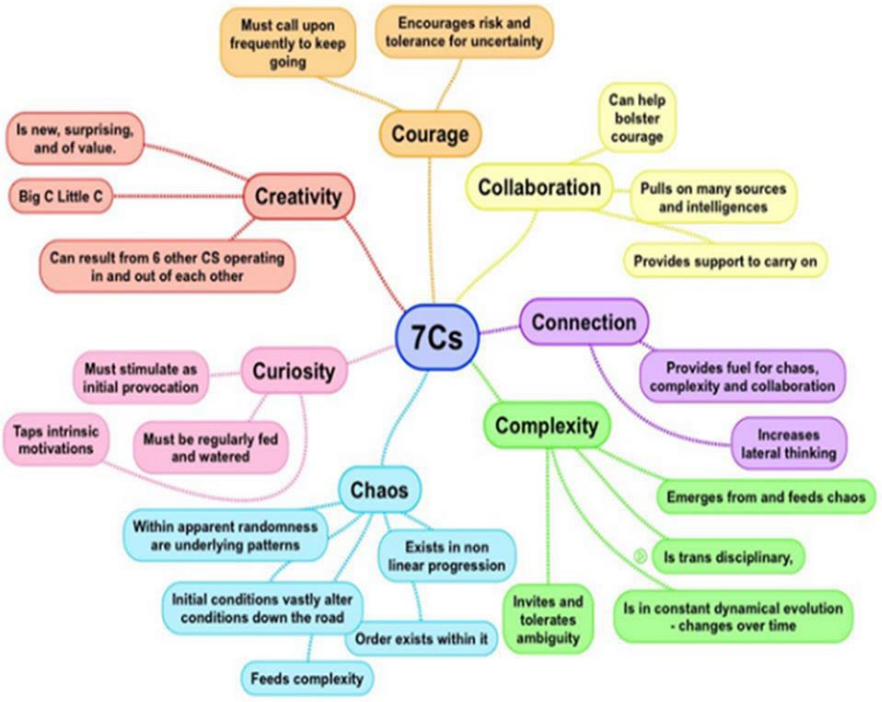

Figure 4. How the 7Cs can work in life (Forbes, 2022).

The 7Cs grew out of pivotal life experiences on land, water, in the studio, and classroom. The 7Cs, their flexibility and relevance in various contexts, will be examined individually, and in relationship, and in greater detail in Chapter 3. The 7Cs are assembled into a method as I have used them in college classrooms, and in the studio in the development of creative projects. The 7Cs can flow in any area in which non-linear, non-binary, non-sequential processes are compelled; which thrives on *chaos* and emergence of order, in whatever form it takes; which is driven by *curiosity;* which resists rigid, and presumptive imposition of order; which need *courage* to act; which is often *collaborative* in nature; which builds *creative* confidence.

Both *curiosity* and *creativity* are *complex*, multifaceted constructs that can be challenging to define and measure (Kidd and Hayden, 2015; Plucker et al., 2004). Ana Junca-Silva and Daniel Silva, business researchers studying the role of curiosity in the workplace, describe curiosity as:

> the propensity to seek out novel, complex and challenging interactions with the world. It drives exploration in response to unexpected problems and events … It has been shown that curiosity has a motivational nature that influences learning, knowledge acquisition, and life fulfillment. In the long run, consistently acting on curious feelings tends to expand knowledge and build intellectual and creative capacities (2021, p221).

One does not have to explain this to a five-year old; it is sometimes a hard sell to a twenty-five-year-old. Larry Vint (2005) discusses the longitudinal research of George Hand (1968 – 1985) performed for NASA on a group of children from age five years to twenty-five years, marking the shocking diminishment of curiosity and creativity as they aged. Hand's research corresponds to my experience with working with humans of many ages.

The development of the 7Cs through my background influences can be found in Appendix 1.

Bridging a Critical Gap in Creative and Educational Contexts

My work as an artist and educator seeks to bridge gaps and create connections amongst different ways of understanding and engaging with the world. For many years, I used the methods of Design Thinking (DT) developed by David Kelley and Tom Kelley (2013), in both education and studio contexts. DT is highly useful but its deficits of being entirely human centered, in terms of trying to repeatedly solve human created problems in human ways, started to butt heads with my growing distrust of notions of human (primarily Western colonial) exceptionality. Universal Design for Learning (UDL) lives in the same human-centered world; it does not step us out of the isolation of human exceptionality, in a world (and cosmos) full of vast diversity (Novak, 2022; Kim, Betz, Helmuth, and Coley, 2023). My own art making experiences and walking with Indigenous Ways of Knowing, have led me to explore alternative ways of knowing, often based in how other species live on the earth. Here lurks a danger of anthropomorphism that must be respectfully avoided. As Patricia Ganea, psychology professor at University of Toronto, is quoted:

> Anthropomorphism can lead to an inaccurate understanding of biological processes in the natural world. It can also lead to inappropriate behaviors towards wild animals, such as trying to adopt a wild animal as a 'pet' or misinterpreting the actions of a wild animal. Common depictions of animals in children's entertainment are likely to amplify this message (Milman, 2016).

7Cs embrace Canadian Indigenous perspectives, in both circularity and reciprocity, and invite *collaboration* and *connection* with other species, representing a departure from conventional anthropocentric paradigms. Eve Tuck (Professor of Critical Race and Indigenous Studies, OISE, University of Toronto) and Marcia MacKenzie (Professor Educational Foundations, University of Saskatchewan) note that,

> Reciprocity in Indigenous methodologies takes a different tenor because of its cosmological connotation, concerned with maintaining balance not just between humans, but with energies that connect and thread through all entities in the universe (Tuck and McKenzie, 2014, p95).

Historically, the Canadian First Nations, Inuit, and later Metis people are connected with the Earth as their Mother. The natural world is considered home, and the rightful stance to take upon her is a respectful, interconnected one of stewardship and gratitude (Kaminski, 2013). Of the Cs, *connection* is often the most useful in terms of moving humans out of their silo of exceptionality. Sometimes, in my work and work with college students, we just fill *connection* with many other species and move from there. A small recent example from class at college: a student is stuck on a project, goes outside to note the first animal from another species they see; student encounters some ants; stops and watches the ants for 1 minute; notices movement is very linear as this row of ants moves from one place to another in a regularized sequence; suddenly, one ant moves out

of line and circles around for a bit before moving back into the line; students comes back into the classroom; decides to occasionally disrupt the very linear process they are involved in and occasionally step out and look around. This begins to break a rigid pattern and allows the project to move ahead. Connecting other species into the *curiosity* or inquiry, moves thinking and feelings into new possibilities for exploration, and reciprocity.

'Seven Seas,' as mentioned, is a figurative term used for all the waters of the world; this brings images of endless fluidly; these images seemed to play along, with the *7Cs* as they evolved – especially as they connect with my experiences at sea (see Appendix 1). Interestingly, Tiffany Lethabo King (2019), draws attention to the British colonizers of the east coast of North America and the unquestioned ideas of logocentric order, in contrast to Black fluidity and Indigenous anaspace. Tuhiwai Smith writes,

> The history of the colonies, from the perspective of the colonizers, has effectively denied other views of what happened and what the significance of historical 'facts' may be to the colonized (2012, p70).

Notions of fluidity that she conceptualizes and shifts thinking away from ideas of human ownership, naming and claiming, and move into a zone of endless flexibility and movement. These influences will lead to exploring the deep Ways of Knowing that can provide new lenses for viewing the world rather than exclusively a Eurocentric colonizers' understanding of the world. According to Cyndy Baskin (2005, p17), member of the Mi'gmaq Nation, Indigenous research is not worth doing if it does not focus on the goals and processes of decolonization and self-determination. I see my role as an artist, instructor/lecturer, and community programmer is to be an ally in this journey.

The privileging of Eurocentric forms of research and documentation is globally pervasive in academic circles. William J. Richardson, Chapter 13, in *Decolonizing University* (Gurminder Bhambra and colleagues (2018 p231), thoughtfully states:

> Although challenging Eurocentric epistemologies in text is an important component of decolonising knowledge systems, less attention is given to how structural and physical factors of the colonial world help create and maintain the same epistemology that scholars are currently struggling to decolonise.

Western thought has come to mediate the entire world to the point where worldviews that differ from the mainstream are relegated to the periphery (Hart, 2010, p18).
Baskin (2005, p17) writes, "Reflexivity and relationality are key in these processes." She goes on to write:

> Story-telling is a valid form of Indigenous knowledge and includes responsibility on the part of the researcher/listener, incorporates both interpretation and analysis, has room for many explanations for the phenomena being researched, is a creative search for solutions, and is a political act of liberation and self-determination (Baskin, 2005, p18).

As a settler ally, reflexivity involves questioning one's own 'taken for granted' assumptions, at the same time, as I noted in my introduction, as conscientiously avoiding "grafting" (Ahenakew, 2016); I do, however, as an artist, lay claim to my personal view of communicating in story and image. Indigenous Worldviews have given me courage to listen, learn, and claim my authentic voice.

Chapter 3 examines the Anthropocene Period, describing the role it plays as the challenging underpinning of everything that is currently happening on our earth and in the cosmos resulting from human hubris. Chapter 4 provides Commentaries on each of the Six Published Works, with brief descriptions of each, and how they connect (sometimes explicitly, sometimes implicitly) to the 7Cs**,** Indigenous Ways of Knowing, and The Anthropocene period.

Chapter 5 provides a very brief conclusion that attempts to tie everything together into ongoing unknowing and discusses where this journey is leading me now (see Appendix 4).

A recent example with one of my college art education students (studying to be a teacher), using the 7Cs to begin work on a space exploration project with grade 5 /6 students (10–11-year-old children), found it an exhilarating experience of total class involvement. Once the *curiosities* started, they led to fragments of research, then the rest of Cs exploded. The class finally settled on a focus: *Dogs in Space: Did they want to go*? The topic, (which will likely alter along the way) leaves room for research on space exploration using animals as test subjects (ethics of human exceptionality), history of space missions, the human-supportable conditions of planets in the solar system. Other questions that arose along the way: should humans go to live on other planets before fixing earth (quote from a student: "I am supposed to clean my room before I go out?")? Who do other planets belong to? Should planets belong to anyone? These are essential questions of colonization which can lead to so many historical and contemporary references. This project is going in directions that Sawyer describes as "deep learning."

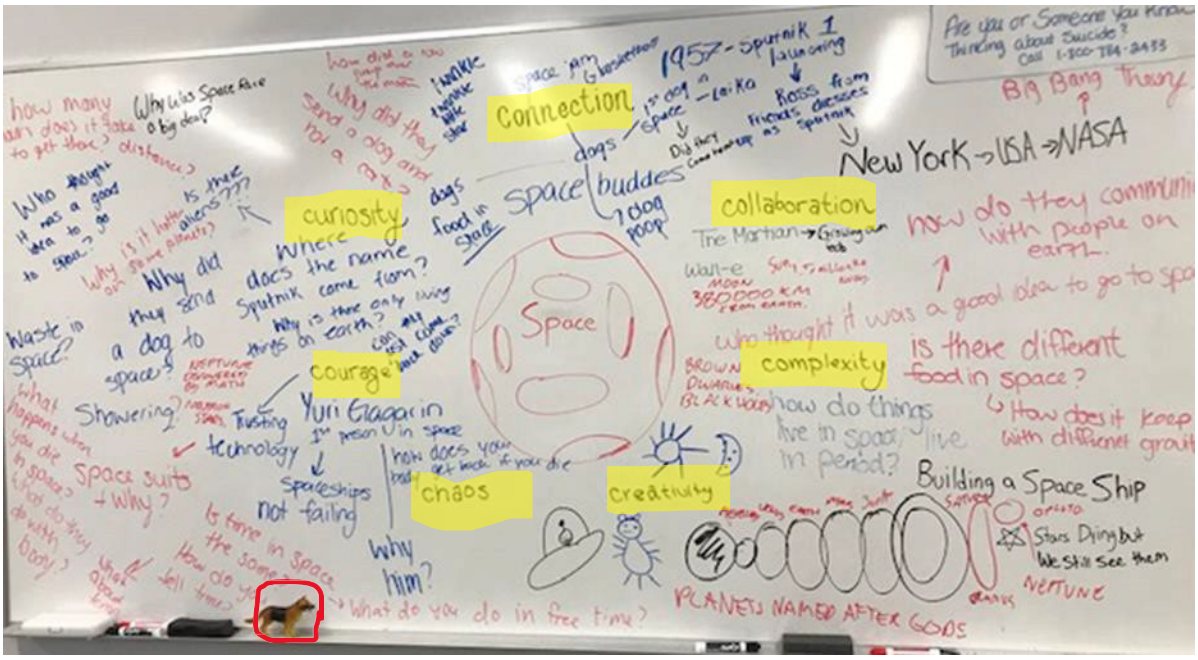

Figure 5. The work of a fifth/sixth grade class (10- and 11-year-old children) with one of my art education college students, acting as a student teacher, in a classroom field experience, as they begin to ponder studying space exploration using the 7Cs. They finally settled on Dogs in Space: Did they want to go? (Forbes, 2023)

Chapter 2: Indigenous Worldviews and Ways of Knowing

Leroy Little Bear is a Blackfoot researcher, professor emeritus at the University of Lethbridge, and a founding member of Canada's first Native American Studies Department at U of L. Little Bear writes:

> A worldview can pertain to an individual, group, or society. Overall, a worldview is a set of beliefs and values that are honoured and withheld by a number of people. A worldview includes how the person or group interacts with the world around them, including land, animals, and people. Every person, and society, has a worldview.

Little Bear goes on to note specifics about Indigenous Worldviews as opposed to Western worldvview as follows:

1.Indigenous: Spiritually orientated society. System based on belief and spiritual world.

Western: Scientific, skeptical. Requiring proof as a basis of belief.

2.Indigenous: There can be many truths; truths are dependent upon individual experiences.

Western: There is only one truth, based on science or Western-style law.

3.Indigenous: Society operates in a state of relatedness. Everything and everyone is related. There is a real belief that people, objects and the environment are all connected. Law, kinship and spirituality reinforce this connectedness. Identity comes from connections.

Western: Compartmentalized society, becoming more so.

4. Indigenous: The land is sacred and usually given by a creator or supreme being.

Western: The land and its resources should be available for development and extraction for the benefit of humans.

5.Indigenous: Time is non-linear and cyclical in nature. Time is measured in cyclical events. The seasons are central to this cyclical concept.

Western: Time is usually linearly structured and future-orientated. The framework of months, years, days etc. reinforces the linear structure.

6.Indigenous: Feeling comfortable is measured by the quality of your relationships with people.

Western: Feeling comfortable is related to how successful you feel you have been in achieving your goals.

7. Indigenous: Human beings are not the most important in the world.

Western: Human beings are the most important in the world.

8. Indigenous: Amassing wealth is important for the good of the community.

Western: Amassing wealth is for personal gain (Little Bear, 2016. np)

Indigenous Ways of Knowing flow specifically from Indigenous Worldviews and have been variously defined by different Canadian Provincial Indigenous entities. The Province of British Columbia definition seems to embrace the main qualities of other provinces and territories, as follows: "Indigenous Ways of Knowing consist of Indigenous Knowledge. This knowledge is founded on the ancestral relationship Indigenous Peoples have with their surroundings. Indigenous Peoples in Canada are First Nations, Inuit, and Métis people" (BC Government, 2016).

Story and Listening

Although story and image have been mainstays in Indigenous Ways of Knowing, story is becoming more trusted in fields of science that traditionally have depended on 'hard' data.

Neurologist Wendy Suzuki and colleagues (2018) discuss the power of storytelling that is now being increasingly embraced by scientists who are studying the neural mechanisms of human communication. They have found that the neural responses are similar across many groups of listeners (this is not typical in academic, subject specific writing and lecturing), and alienation of listeners/learners that can take place when running straight into data; in contrast, storytelling moves from didactic to empathic.

Judy Iseke (2013 p558) describes storytelling as part of an ancient tradition of passing on knowledge and understandings; humour is an essential aspect of story. Justice Murray Sinclair, during an address at Thompson Rivers University in Kamloops, British Colombia said of story,

> It [a coyote story] could be an hour long; I could give you the general framework or what that story meant, however, it's up to the listener to really decipher the wisdom within the story. What's important is that the story itself is so powerful the meaning is derived by the learner (Thompson Rivers University, 2018).

Judy Iseke continues passionately regarding story as a tried-and-true pedagogic practice that reflects the epistemologies of Indigenous communities:

> "Indigenous peoples engage oral traditions, historical/ancestral knowledges and resources to examine current events, and Indigenous understandings in ways consistent with traditional worldviews and cosmologies" (2013, p559). Although it may well challenge the very notions of what many think is sound pedagogy and what are sound educational processes, others might consider as credible research in academic environments, storytelling/story re-telling and extemporaneous story-building as a central focus of Indigenous epistemologies, pedagogies, and research approaches. According to Rita Bouvier, storytelling:
>
> "… represents a formal shift of thinking and writing from a modernistic, expository prose of grand western narratives to a more storytelling manner as a way of uncovering—revealing—a nuanced and balanced perspective of a colonized history and, through it, unmasking the faulty logics of knowing grounded in objectivity and Eurocentric theorizing that have undermined Indigenous peoples' knowledge systems" (2013, p11).

I listen to Dana Hickey, Anishinaabe researcher, as she posits that understanding more about epistemologies of power will help illuminate a pathway by which Indigenous Peoples and Canadians of settler ancestry can better understand one another, "creating the shift in these relationships that is required in order to gather large-scale support for reconciliation and for ethical distribution of power resources in Canada" (2020, p14). I listen to many other writers and thinkers of Indigenous Ways of Knowing and try to document, in their own words and stories, to help me on my journey toward truth and reconciliation (Truth and Reconciliation Commission of Canada, 2015).

Little Bear (2016) clearly states that Indigenous Ways focus on sustainability rather than on exploration, power, economic dominance. These words reinforce the commitment to being part of nature, not viewing nature as a commodity to be exploited, and described in reductive mercantile terminology. Species, other than humans, present themselves in story and image as equal in value, voice, intelligence, and spiritual positioning. There is no hierarchy.

Story 1: How Honouring Emerges in Time and Heart

To illustrate how storytelling has provided methodology for my research, here are three recent

stories: two in words, one in image and words that continue to teach me. I was invited by a former student to attend Indigenous Graduation 2022 at my college, Medicine Hat College. Indigenous Graduation is a ceremony in addition to universal graduation and is organized and developed by Indigenous students and our First Nations, Metis, and Inuit Coordinators. Each graduating student invites two guests, the room is small, there is no stage, everyone is seated at round tables. Elders play important roles, there are few scraps of paper with notes, agenda, or written speeches. The speeches are given extemporaneously from the heart. The President of the College stood to begin his speech, then sat down again, then laughed with embarrassment, then folded his papers and started to speak. Most of the speeches from non-Indigenous 'dignitaries' followed this form. There was great hilarity. People laughed when they forgot something and threw in a comment later. The Elders told stories that did not seem to have anything to do with a graduation ceremony until you thought about them later. There were a few trickster stories involving coyotes. We then ate bison stew and visited and laughed and hugged. The Elders' stories repeat themselves later in the quiet of your mind and heart. The stories are still repeating and lead me to the home of the 7Cs. *Collaborations* were rampant as people called out bits to the story; *connection* to the world of many species was ever present; *complexity* was expanding at the speed of light as new characters and plot shifts emerged; *chaos* was simmering and finally order emerged near the end with no clear general direction but opportunities for after-thoughts in each individual. *Courage* was a given in a room of no written notes; *creativity* lives with no story ever told twice in the same way.

Figure 6. Experiences with the Song Dogs of Grasslands (Nathan McCarville, August 17th, 2020). https://www.coyotewatchcanada.com/site/blog/2020/08/17/experiences-with-the-song-dogs-of-grasslands-national-park

Story 2: How Everything is Said in Story Without Answering a Question

I am a municipally elected Public School Board Trustee. The School Board oversees all publicly funded Kindergarten to Grade 12 schools in the City of Medicine Hat. As a Board, we were trying to figure out whether on September 30, National (Canadian) Day of Truth and Reconciliation, we should honour the day by making it a holiday (a day off school), or plan a day devoted to Indigenous activities, speakers, games, and learning, in school. We decided we had better ask an Elder for advice. Elder Charlie Fox couldn't come to the meeting, so we talked to him on speaker phone. We asked him our question; what ensued was about 45 minutes of storytelling about a coyote. We listened quietly and then asked for his recommendation: holiday or activity day? Charlie answered, "that's something you have to figure out. Nice talking to you, bye for now!" We left the meeting not knowing what to do. Later the stories started to come back to each of us in different ways. We decided to have September 30th be a school day of storytelling. We laughed and hugged. I cannot speculate on why Elder Charlie told us all the stories, but I can comment that in listening to the stories we were fully engaged. Through our bewilderment, we came to stories, as a central idea for each school to organize around.

Canadian Indigenous writer, Thomas King, begins every chapter in *The Truth about Stories* (2003, p1) with, "There is a story I know. It's about the earth and how it floats in space on the back of a turtle. I've heard this story many times, and each time someone tells the story, it changes." I have come to partially understand that narratives with Indigenous Worldviews are often passed down from generation to generation. Many stories have been lost; many have been recovered. There is flexibility built into the form. A certain coyote (trickster) story, for instance, that you think you know is suddenly told in an entirely different way. The story fits the time, the setting, the teller, the listener.

Essential to developing my methodologies are my own origin stories documented in Appendix 1**.**

Nature and the Circle

Bob Joseph is a member of the Gwawa'enuk Nation, and a hereditary Chief of the Gayaxala clan. Joseph grew up in Campbell River, B.C. and lives in Qualicum Beach, B.C. He writes:

> The circle, being primary, influences how we as Aboriginal peoples view the world. In the process of how life evolves, how the natural world grows and works together, how all things are connected, and how all things move toward their destiny. Aboriginal peoples see and respond to the world in a circular fashion and are influenced by the examples of the circles of creation in our environment (Joseph, 2014).

Central to the circle is that there is never a strict hierarchy; power for everything (humans, every species, past, present, future) is distributed, it is reciprocal. My research method is built on such a structure. Although Indigenous peoples' World Views are not all alike, circular thinking and being seems to be common to most. Indigenous teachings take place most commonly in oral stories/teachings. The 7Cs are constructed in a circular relationship; there is no beginning or ending. As my diagram shows (see Figure 4, p18), I use the 7Cs in circular format in my own creative work, with college students, and community groups, in the circular explorations that reveal themselves orally and graphically, to guide action.

Image and Looking/Feeling

As a generative context for my research, and how storytelling works in creative practice I continually return to the works of Indigenous visual artists Kent Monkman and Brian Jungen.

They each have, in singular approaches, taken on Indigenous Worldview and colonization in extraordinarily creative, insightful, and witty ways that formally use products of the colonizers. In Monkman's case he notes influences of French Romantic history painters such as Eugene Delacroix, Theodore Gericault; earlier Spanish Baroque painter, Diego de Silva Velázquez; and American Revolutionary painter, Emanuel Leutze. Monkman's large scale paintings are familiar in form to these famous works of art but with his Indigenous, two-spirit content, (and huge doses of humour with Miss Chief Eagle Testickle in black, spike heels as host(ess)), they speak in a very different voice to discuss colonization, residential schools, and gender identity to mention only a few of his major topics.

Figure 7. Welcoming the Newcomers (Kent Monkman, 2019). Acrylic on canvas, 3.3 x 6.7 m. Courtesy Metropolitan Museum of Art, NYC. NY. Photo: Joseph Hartman.

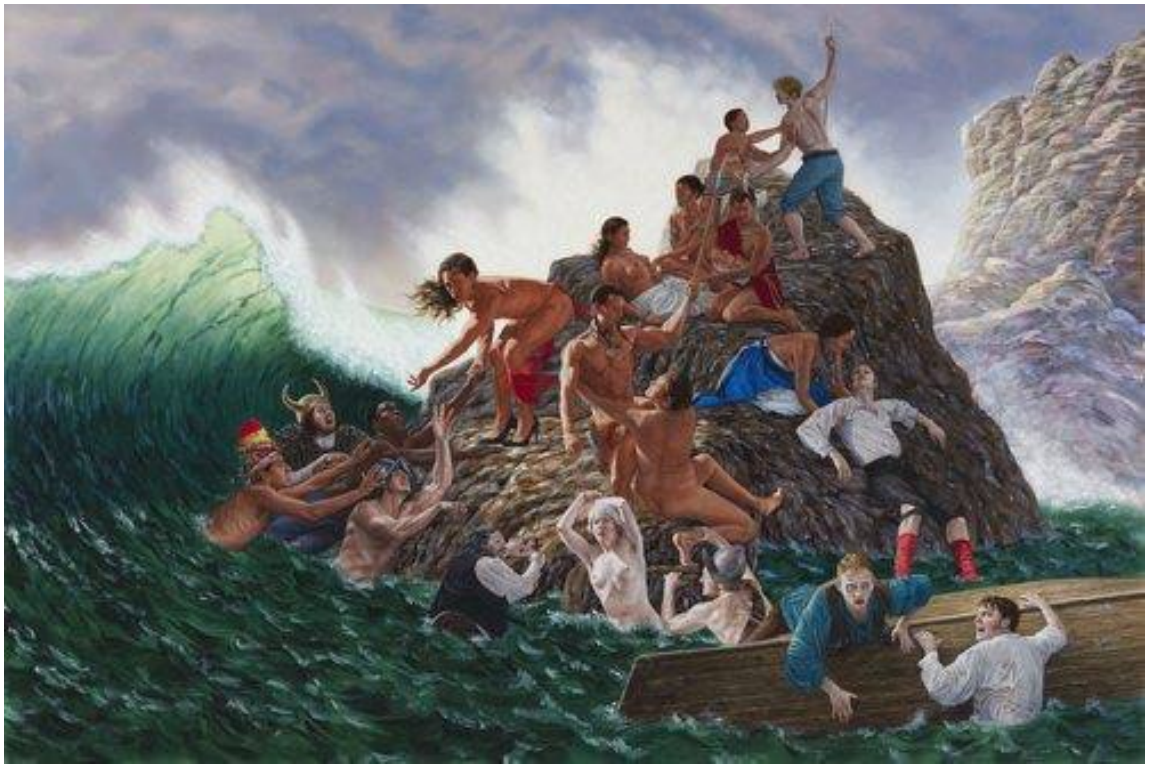

Figure 8. Saving the Newcomers (Kent Monkman, 2023). Acrylic on Canvas. 84" X 126." https://www.kentmonkman.com/painting/saving-the-newcomers

Brian Jungen uses desirable consumer products to make work that can tell a million different stories. The forms are often taken from Northwest Coast Indigenous iconography (totem poles and masks), and natural history. The materials are often Nike shoes, golf bags, plastic stackable patio chairs. The craftsmanship in Jungen's work is exquisite. These works provide continual learning in both image and story about consumer-culture, colonialism, indigenous iconography, and waste.

Figure 9. Totem. Installation view (Brian Jungen, 2007). Catriona Jeffries Gallery, Vancouver BC.

Figure 10. Masks (Brian Jungen, 2014). https://songandcrest.com/2014/02/10/mask-monday-brian-jungen/

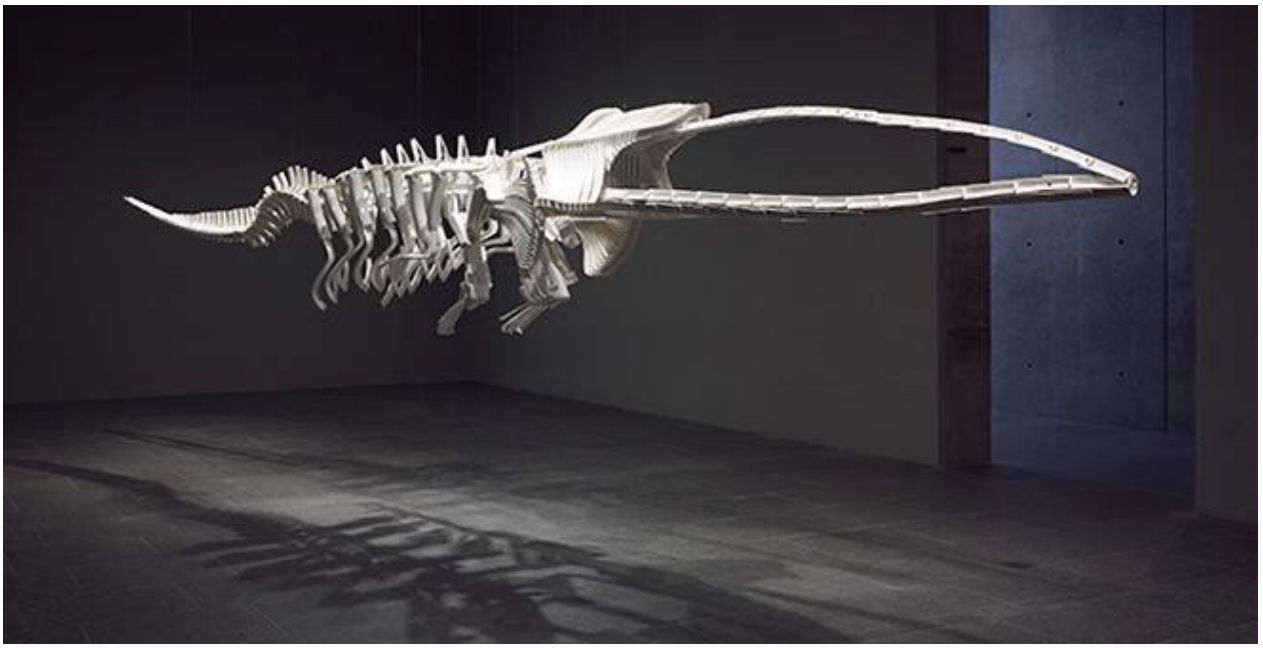

Figure 11. Plesiosaurus (Brian Jungen, 2003). Vienna; white polypropylene plastic chairs, 125 x 850 x 130 cm. Purchased 2004 with the Joy Thomson Fund for the Acquisition of Art by Young Canadian Artists, National Gallery of Canada Foundation. NGC.

Monkman's bold honouring of Miss Chief Eagle Testickle (figure in high spike heels), for instance, as magnanimous hero-greeter of the colonizers, with great wit, challenges the historical story told of colonizers saving the savages. Jungen completely deconstructs and reconstructs mass-produced consumer items into singular Indigenous ceremonial objects, of great strength and beauty. The works of Monkman and Jungen give me courage to create authentic vision in my own artworks.

Chapter 3: Wandering the Anthropocene

> 'Anthropocene' exposes the fallacy of human exceptionalism, reminding us of the entangled nature of human and nonhuman agency, and the vast and decidedly nonhuman proportions of human action (Johns-Putra, 2018, p26).

The decision to officially add the Anthropocene Epoch to the geologic time scale was rejected on March 5, 2024, in an official vote, by the International Commission of Quaternary Stratigraphy. Crawford Lake, Ontario, had been nominated for the 'golden spoke'. A literal brass marker that signifies that the planet shifted, in about 1950, from one unit of geological time to the next (Voosen, 2023). An international team of stratigraphers (the Anthropocene Working Group) nominated this location as the clearest global example pinpointing the start date of the Anthropocene – the epoch in which human actions have incontrovertibly and irrevocably shaped the planet's fate (Martin, 2023). Although Anthropocene Epoch was rejected, the title Anthropocene remains an acceptable name for the period.

Although the Anthropocene Epoch, a term coined by 1995 Nobel Prize winner in chemistry, Paul Crutzen, famous for deciphering atmospheric loss, ozone loss, the predictable effects of nuclear winter, and recognizing a new geological epoch of human making (Crutzen, 1995), has not been accepted at this time, this naming has spilled out of science into political and economic discourse all over the planet (Zalasiewicz, Waters, Steffan, 2021). Zalasiewicz and colleagues go on to describe how, over the last century, the Earth has been sharply set on a new trajectory, towards a warmer, more biologically impoverished, and polluted state, and that all species are now charged with accelerated changing, modifying, adapting, or perishing.

Living in the Anthropocene period is an important influence in my work. I include other species and move away from human exceptionalism. Building creative confidence cannot be done in a human- inspired vacuum; all species need to be honoured and included, not in anthropomorphized magnanimous gestures, but as true partners.

Considering the work of Reichel and Perey (2018) and how taking a 'degrowth perspective' in order to bring an end to the Auxocene, as the first age of the Anthropocene; or Haraway (2015) and their interest in precise naming and categorizing as a means to understanding and addressing the plight of these era (Anthropocene, Capitalocene, Plantationocene, Chthulucene); or Butcher and Fletcher (2020, p3) and their assertion that neo- protectionists (who oppose ideas of human

induced change and believe there may be many benefits) are likely leading the earth to the downfall of homo sapiens and other species, the plight remains the same. As interesting as many of these finer distinctions and strong oppositions are, my research argues for story and image as more generative replacements for the particularly human entanglements of naming, renaming for clarity, proving, and disproving. For example, I look to the work of Ed Burtynsky to speak to me in story and image (photographs and videos) in the clearest voice concerning the Anthropocene period. This helps me to ponder the big questions about our planet. Burtynsky's photos lay bare the effects of human action on earth.

Burtynsky's works are empathic rather than didactic. A quotation from Burtynsky from the *Anthropocene* exhibition at the Art Gallery of Ontario states:

> Our ambition for the work is to be revelatory not accusatory. As we examine the human influence on the earth both on a planetary scale and on geologic time. The shifting of consciousness is the beginning of change (2018).

Figure 12. Dandora Landfill #3, Plastics Recycling, Nairobi, Kenya (Ed Burtynsky, 2016). https://www.edwardburtynsky.com/news/videos.

Burtynsky writes:

> I have come to think of my preoccupation with the Anthropocene — the indelible marks left by humankind on the geological face of our planet — as a conceptual extension of my first and most fundamental interests as a photographer. I have always been concerned to show how we affect the Earth in a big way. To this end, I seek out and photograph large-

scale systems that leave lasting marks (2018).

When I look at this work of Burtynsky, I see stories in the image. Burtynsky asks the viewer to step into the work and feel what is happening. For over forty years, his remarkable photographic depictions of global industrial landscapes bear witness to the impact of human action on the planet. When entering his work, asking my students and I, “So, what are we looking at?” and then embarking on mapping the 7Cs, deeper understandings are revealed much in the same waythe Grade 5/6 class started to understand, in an age-appropriate way, the scope of their space exploration project (Figure 5, p23).

Chapter 4: Commentary on Published works Sailing in Circles: Why 7Cs?

"Do you know a cure for me?"
"Why yes," he said, "I know a cure for everything. Salt water." "Salt water?" I asked him.
"Yes," he said, "in one way or the other. Sweat, or tears, or the salt sea." (Dinesen, 1934)

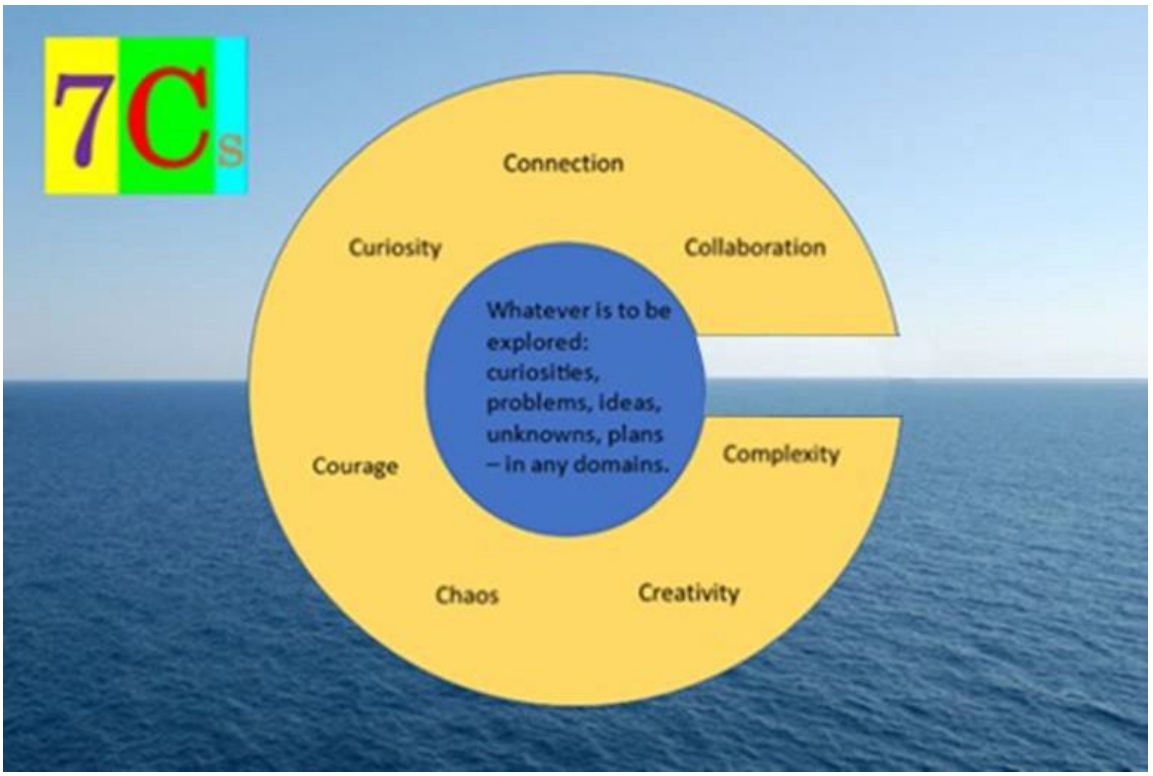

Figure 13: 7Cs (Forbes, 2021).

The 7Cs in their interconnected circularity are my original contribution to knowledge. Sailing in circles is an apt description for how all the published works included in this commentary evolved. The book chapters, installation works, public workshop, and publication all start as clusters of curiosities that sail in and out and around the 7Cs, stopping into ports of call as required. *Curiosity* never turns into a clear research question, in fact, almost the opposite; the questions expand and attenuate, gather connected *curiosities* and *connections* (always with other species in my installation work), and, with the help of *collaborators,* moves to *complexity* and through to chaos. Without *complexity,* and its movement in and out of *chaos,* presumptive conclusions can be drawn, and the work across contexts referred to above suffers.

Physicist, K. Lee Lerner (2001) writes,

> Chaos and order, as used in chaos theory, are terms used to describe conditions of complex systems in which, out of seemingly random, disordered (aperiodic) processes, there arise processes that are deterministic and predictable (order) (p1).

I trust *chaos* implicitly and, experience has shown me, from *chaos* emerges order, not a tidy sequential order but one I recognize when I see strong authentic voice and vision, which can also be recognized by others (e.g., artists, students, reviewers, children). As novelist, Jose Saramago (2002), succinctly writes as one of two epigraphs (np) to *The Double*: "Chaos is merely order waiting to be deciphered."

My peer-reviewed and professionally curated published works have emerged from the 7Cs at work, in the studio, in research, and in my instructional practices with college students. I am now seeing them leak into elementary school as my college students enter classrooms (see Figure 5, p23).

Commitment to artistic production, co-constructing meaning with students, academic research, but most importantly lived experience, have helped me to form this contribution to knowledge. Circularity and reciprocity are reinforced by Indigenous World View. In terms of the role of lived experience, the 7Cs entered my early life while working on fishing boats off the Canadian Pacific coast.

My experiences prepared me to recognize *complexity,* systems whose behavior is intrinsically difficult to rigidly model due to the dependencies, interdependencies, competitions, relationships, and interactions between parts of each system (for example, orcas, dolphins, sea jellies, seals, tides, chucks, swells, towers, other fishing boats, ferries, crew members and their personalities and hierarchies, sonar, radar, winches/scales, shore profiles, fog, rain, sun, Indigenous fishers, villages and artefacts, weather reports, weather warnings, extreme weather episodes… to mention a few). Systems have distinct properties that arise from relationships, that are largely nonlinear, emergent, spontaneous, endlessly adaptative, and rife with feedback loops. I began to learn of *complexity* and *chaos* through these experiences (see Appendix 1).

Through marine experiences that were life and death, I learned *courage* (pay acute attention and deal with it); I learned to be *curious* about everything, always (no telling when presence of sea jellies gives information about important currents – sea jellies always move against the current); I learned the essential importance of *collaboration* for survival; I learned that *creativity* must be unleashed in order to deal with constantly changing conditions that require solutions with whatever meagre tools are on hand; most profoundly, I learned that absolutely everything is *connected.* For instance, taking note of small changes such as noticing animals with more ruffled-up fur and feathers is connected to weather: it is going to get colder. We need colder weather for longer. Returning harvested salmon bones to the spawning streams keeps them cleaner and more nutrient rich. More nutrient rich spawning streams mean more salmon, if only the weather can stay colder so the streams continue to have run off water. Now roll this story in reverse.

The principles that underpin the 7Cs as methods, discussed in the Method section of Chapter 1, and graphic diagram, Figure 5 on page 23, revealed themselves to me again in my own art practice, then started to leak into my college instruction/lecturing, and other areas of my life. I started to understand how minute alterations lead to striking consequences, how the apparently random states of disorder eventually reveal patterns that speak of larger truths. To work with the Anthropocene challenges of the 21st century, many of which have yet to be uncovered, my research and pedagogical experience argue that humans will need to be nimble thinkers, feelers, and actors who embrace *chaos* and have *courage* not to shrink from *complexity*. I have come to know creative process and production as learning at its best, not limited to typically described creative fields, but can be applied and embraced for learning of almost anything. This is an understanding of my own creative processes, and the creative processes of those with whom I work; they need to be fluid, continuous, and collaborative co-constructions of meaning. The 7Cs can lead to destinations of robust creative confidence.

Now entering the published works, I have tried to elaborate in the commentaries, how the 7Cs are the structural underpinnings of each.

Commentary on AI, Andy, Alan, Algorithms, and Boden: The A's and B of Making Art with Aesthetic Meaning (2022)

Supported in part by professional development fund, Medicine Hat College.

This book chapter began as a conference paper to an international conference, Liberal Education in the Age of Automation, hosted by Mount Royal University, Calgary Alberta, May 2022. Subsequently, the conference papers were submitted for peer review, and a book, edited by Karim Dharamsi, David Ohreen, was published in 2023, in Willington, Del. USA by Vernon Press. I had been reading extensively about AI, art, and creativity. The initial curiosities: art produced by algorithms; human creativity; human consciousness and the brain; more complexity theory. At the same time as this, I was reading about Alan Turing, Enigma (Imperial War Museum, no date), and the Turing Test (Turing, 1950), exploring autism and art (Pennisi et al., 2020) with a college education class, thinking about Andy Warhol and the impact of Orthodox church iconostases (Hall, 2020), and indulging my fascination with automatons throughout history (The MAD Museum, no date). In other areas of my work, connections are often from the world of nature, but in this instance, connection moved to non-human mechanical, digital and mathematical agents.

In this short commentary, I will discuss how the 7Cs operate to create this book chapter. This discussion is about form as well as content, as I see the necessity of having the form itself, speak to the content. Mitchell Waldrop (1993), thirty years hence, is still pivotal in use of complexity theory with the multi-disciplinary think tank in Sante Fe, New Mexico. He writes, "complexity theory is the messy, funny, human story of how science [and creativity] really happens." Physicists and mathematicians explored their deep impatience with the kind of linear, reductionist thinking that has dominated science since the time of Newton. Instead, they were gathering novel ideas about interconnectedness, coevolution, chaos, structure, and order (*order* in the chaos/order relationship) - and forging them into an entirely new, unified way of thinking about nature, human social behavior, evolution, economics, life, and the universe itself. 'Order' in this sense is not used in a manner suggesting linearity, force, or

authoritarianism; it is used as part of a symbiotic relationship with chaos. Although an artist, not a scientist, the content of my work seems to frequently lead me into many of the ideas of physics, particularly into areas of *complexity*, *chaos*, and emerging order. I resist reductionist, formulaic writing whenever I can. Circularity, which is a main tenet of Canadian Indigenous World Views, allow moving in and out if whatever C seems to have promise.

In the book chapter, I posit a path (see Published Works p8) to be used as a navigational tool for the reader. This is the order that emerged out of the *chaos* of exploring and researching, for which I use language suggestive of movement and pathfinding. The path is not straight; it wanders, circles back on itself, and sometimes seems to go in two directions at once.

My commitment to story allows me to create a fiction, with Alan Turing and Andy Warhol as characters. Story, encouraged by Indigenous World Views, better demonstrates some of the concepts I am exploring in the paper, than traditional academic writing mic writing, which I also use. More than a hundred years ago, mathematician Henri Poincare, in 1910, when writing about mathematical creation, stated, “They [physical laws] are those which reveal to us unsuspected kinship between other facts, long known, but wrongly believed to be strangers to one another” (Poincare, 2000, p87). This could explain how Andy and Alan kept encountering each other in my research and writing processes.

My deep commitment to *connection* is supported by John Berger (2005), who has long been an influence in my work. He writes, “Nothing fortuitous happens in a child's world. There are no accidents. Everything is connected with everything else, and everything can be explained by everything else” (Berger, 2005, p3). By writing *As and B* in the manner that I did, I was attempting to show the particularly human way of intuitively collecting, connecting, and organizing information and ideas. The peer reviewers for the chapter noted that my chapter was unconventional for an academic publication, but entertaining, provocative, and informative therefore worthy of inclusion

Commentary on Complexity, Chaos, Collaboration: Untangling Strands of Truth; Teaching/Learning/Teaching in the 21st Century (2021)

Supported in part by professional development fund, Medicine Hat College.

I submitted *Complexity, Chaos, Collaboration: untangling strands of truth; **t**eaching/learning/teaching in the 21st Century*, as a conference session offering to a Liberal Arts conference at Mount Royal University (Calgary, Alberta, Canada), May 2018. The conference was entitled *Between Truth and Falsity: Liberal Education and the Art of Discernment.* A peer-reviewed book of the same title was published in 2019, in which my chapter was included.

This book chapter discusses the co-construction of a pedagogy for a Critical Theory course, that I and my students embarked upon, to construct meaning together. Before I became instructor of ARHI 300, Critical Theory, for students in an art and design program at Medicine Hat College, it had been delivered in a straight lecture format with mid-term and final exams, as well as a formal paper. The College Visual Communications students hated it, just tried to pass, and get it over with. I found this heartbreaking as so many of the big ideas that have influenced late 19th century, 20th and 21st century thought, action, and art (e.g. gender identity; race, ethnicity, religion; political and social systems; colonialism) are explored in this course. I challenged myself to fully engage the 7Cs to breathe new energy into the Critical Theory course and into the students.

I see my job as college instructor/lecturer as helping students to move into the zone of proximal learning (Vygotsky, 1978) and then move beyond. Social constructivist principles of education were the beginning of moving toward complexity theory in the college studio/or classroom (Johnson, 2005). Although I am working with college students, not young children as Lev Vygotsky discusses, seeking to create an appropriate zone of proximal learning has been effective. I try to act as guide for my students in ways that meet them where they are, and then using inquiry-based methods, help them to figure out where they would like to go, and then finally to move in that direction.

This journey is different for every student; this is an individual and group process. Finding that zone of proximal learning was a starting place, but it became evident that more was required to help students to step out of well-trodden paths, most of which were results of aspects of instructionist pedagogy (Johnson, 2005); I knew more of a shake-up was required. Henrickson (2021) and colleagues write persuasively, in six international contexts, about uncertainty and risk as essentials for learning. The need for entering uncertainty and experience of risk took me to *complexity* theory. My own art practice had embraced *complexity* many years before.

To help my students to unfetter the C of *curiosity*, we used silent work (congregated anonymous sticky notes on walls); working in silence seemed to release inhibitions and allow students to move toward increased confidence. These notes were then congregated using criteria we established together. Student collaborations were formed in many ways for many purposes - all that was needed was to *courageously* unleash *creativity* and take some risks to develop a project for the Critical Theory Fair (see Six Published Works, p53), an invention of our class to invite anyone wandering through the main hallway of the College, to engage with 'big ideas,' as students came to call them. The project development stories have been shortened to comply with word limits for the book chapter, but I can attest to how stretching ideas through *complexity* out to *chaos,* and then pausing to wait for order to emerge, happened many more times than it did not. *Connection* was just starting to move out of the exclusively human, especially with Nancy's Story (see Six Published Works, p54); *creativity* burst forth.

My contribution to knowledge comes from using the Cs in concert to move off safely trodden pathways toward more creative methodologies. In fact, I have now tried the 7Cs in so many settings (e.g. long-term care homes with seniors with dementia, kindergarten to grade 6 classrooms, artist workshops, family literacy staff trainings) that I am confident that they can work in almost any setting in which creative confidence is required. As in all my work, story in authentic voice plays an important role in the chapter; the stories relating to how some of

the students developed their projects for the Critical Theory Fair (Six Published Works, p53-60) play a very important role in revealing processes that were built in the 7Cs. By starting to trust *chaos*, order did eventually begin to emerge into most of the Critical Theory Fair projects. This happened year after year as the Cs and their uses refined and found new uses. Watching the public be drawn into the Critical Theory Fairs, to engage in looking, contemplating and discussing, while observing the students as they presented the projects with confidence, was a validation of what working in the 7Cs can bring to learning.

Commentary on *The Princess and the Plesiosaur* (2014-2015)

Funded by the City of Medicine Hat, the Alberta Foundation for the Arts, and Canada Council for the Arts.

The *Princess and the Plesiosaur* is an interactive, installation exhibition. Robotic princesses (and viewers) travel through a video-scape of terrestrial wind, fire and water as they navigate a plesiosaur constellation (see Appendix 3 for preparatory ideas/images). The installation comprises:

- A video-loop projected onto gallery floor and walls of fire, wind, water, the cosmos
- A constellation of flickering dots in the shape of a plesiosaur embedded into the video-loop (now fossilized plesiosaurs swam in the Great Cretaceous Seaway under my feet).
- 3 robotic princesses that navigate the constellation (adapted Roomba vacuums with princess figures built onto them using welded steel farthingale forms, willow branch "head suggestions,' bones, feathers and fossils found on the prairies (the seabed of the Great Cretaceous Seaway), as well as charity shop foundling doilies that became crocheted doily dresses.
- Dancing shadows (the found object princesses skeletons create moving shadows that interact with the video-scape, constellation, and shadows of viewers).

The shadows that result from interaction of the moving princesses and the projections

are a critical aspect of the exhibition that builds on previous shadow and princess work. Shadows, as the dark figures cast upon a surface by a body intercepting the rays from a source of light, are the evidence of interaction with a light source; they are sharply visible but not permanent. Playing with shadows questions permanence. This exhibition was many years in the making and was structured to invite engagement with both adult and child viewers, and their shadows. I have worked with princess images and ideas since 1998 and have produced seven related but distinct bodies of work: *Degrees of Extinction (1999)*, The *Infanta Project Series 1 and Series II (2002), Princess Mysteries (2005), Xiangfan Princesses (2008), Shadow Princesses (2012-14)*, *Princess and the Plesiosaur* (2015). Interwoven into the investigation of princess as icon, the *Princess and Plesiosaur* (Esplanade Art Gallery, Medicine Hat, Alberta),[6] continues my investigations regarding the role and social function of the idea of princess through history from fairy/folk tales to the iconic images of the Diego da Silva Velázquez' Infanta Margarita, to Disney princesses, to more contemporary reality TV, such as Toddlers in Tiaras which ran from 2009-2016 (IMDB, no date), and endless, ongoing tabloid reports on the still unsolved murder of child beauty pageant winner, Jon Benet Ramsay (Flynn, 2023). This web of connections continues to grow. By suspending my judgments and allowing myself to follow rather than lead investigations in my work, I end up working with the questions and ideas the work needs. Because this leads to allowing *complexity* to 'cure,' the work avoids becoming a polemic. I never want to present a single coherent message, but simply to open spaces, literally and figuratively, for experiences and engagement to develop in many ways.

The idea and image of 'princess' persists within our collective imagination. Every five-year-old child can draw a princess – and the drawings are remarkably alike (poufy dress, long wiggly hair). In this social fiction of popular culture, little consideration is given to how princesses throughout history have been used as political pawns. Anne Duggan (2023), in *Lost Princesses*, does a masterful job of mining the history of princess fairytales to reveal how we got to the current mis-destination. Rebecca Haines (2014), children's media expert, in *The Princess Problem: Guiding Our Girls Through the Princess-Obsessed Years*, brings

critique into contemporary marketing, in the dissection of princess marketing that reveals inherent gender stereotyping, centered on romance, beauty, passivity, and ethnic homogeneity, with non-Caucasians accorded only token representation. This was, at least, until *Frozen*. Disney seems to have heeded some of these gendered critiques. Frozen subverts these ubiquitous princess frozen tropes with its main characters, Anna and Elsa, who—despite physically fitting the profile of classic Disney princesses by being white, rich, and shockingly thin—display agency in ways that past princesses have not (Feder, 2014).

Complexity allows space for the many ideas and images of princess to move together, overlap, collect chaotic attractors[7] from the world of nature and natural history. Layered into the princesses in *The Princess and the Plesiosaur*, are fossils and objects from nature that populate my studio. Indigenous Worldviews situate human beings as interconnected to land and holistically in relationship to others all other species past and present. My commitment to giving the princesses agency to move at will (the Roombas are not programmed), was exhilarating.

Figure 14. A few studio objects (D. Forbes, 2023).

Collaborations were vital to this work: farthingale welder, Jill Timushka; videographers, Barb Mitchell, Rory Mahoney, and Josh Pick; doily fabricator, Nicki Romanuk; naturalist and engineer, Paul Thibault, and viewing participants all collaborated in building and showing this work.

Folded into the *complexity* of *The Princess and the Plesiosaur* are 19th century scientific, Geological Society of London notions of dinosaur fossils being dragons (The Geological Society, no date). Instrumental in changing these convictions was the work of an amateur paleontologist, with very little formal education, Mary Anning (The Geological Society, no date). The dragon presented itself again when I was a visiting scholar at Xiangfan University, Hubei Province, China, 2008. Every day I watched two little girls chatting on their way to the campus elementary school. They carried Disney Princess backpacks. Iterations of dragons were everywhere on the campus and in the hills above it. Notions of globalization brought on by consumer culture, instigated another installation work, *Xiangfan Princesses* (2009) that in part, explores western understandings of good (princess) and evil (dragon) countered with eastern understanding of good luck (dragon). The *complexities* all folded into the *chaos* from which order evolved into *The Princess and the Plesiosaur.*

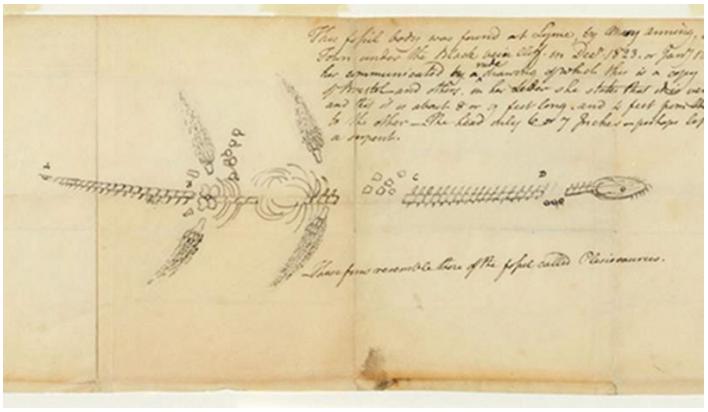

Figure 15. Mary Anning's sketch of her first plesiosaur is from 1823 and is one of many plesiosaur drawings from the finds of the cliffs of Lyme Regis, UK. Natural History Museum, London UK. https://www.nhm.ac.uk/discover/mary-anning-unsung-hero.html

There were many challenges during the installation that required collaborations and courage from many very smart people. When we pressed 'start,' so to speak, a miracle of self-organizing order appeared from the *chaos*. The surprising sizes of the shadows as they come, go, and disappear into the corner, the exquisite, balletic chaînés that occur when the little princesses turn in perfect coordination with their shadows, the elegance and dignity of these little figures, took our breath away! These little robotic princess-beings appear

somewhere between post-apocalyptic space junk and shredded elegance; these mighty little princesses negotiate and navigate a new constellation named Plesiosaur. Exploring human history, particularly the history of women and girls, blended with natural history, in a form that is dynamic and invites participation of gallery viewers of any age, seems to be a largely unexplored niche.

Access: www.deborahforbes.com *The Princess and the Plesiosaur*. Vimeo https://vimeo.com/114837011

Commentary on *Not All Who Wander…* (2015 – 2016)

A documentary video of highlights from *An Encounter with the Princess and the Plesiosaur, in three parts.* Funded by City of Medicine Hat. Alberta Foundation for the Arts, and Canada Council for the Arts.

To accompany the exhibition *The Princess and Plesiosaur*, (Esplanade Art Gallery, Medicine Hat, Alberta), *An Encounter with the Princess and the Plesiosaur*, in three parts, was designed to involve viewers in an interactive process of engaging with a specific work of contemporary art, in order to expand approaches to engaging with contemporary art in general. This education/exploration plan, including a discussion evening (*A Brief Encounter with the Princess and the Plesiosaur,* 30 participants, November 2015), an expanded one-day workshop (*An Encounter with the Princess and the Plesiosaur,* 18 participants, December 2015), and six months' later (*Late Encounter with the Princess and Plesiosaur,* 12 participants. June 2016) provided thirteen hours of video footage that were then edited down to a 34-minute documentary video. All three episodes were conducted at the Esplanade Art Gallery, Medicine Hat, AB.

Figure 16. Esplanade Art and Heritage Centre, 401 1 St SE, Medicine Hat, AB, Canada.

By inviting viewers into the inner workings of *The Princess and the Plesiosaur* exhibition (a previous exhibition, *Shadow Princesses,* also had viewer engagement opportunities*)*, rather than restricting viewers from without, provided the viewer with an interface that is viscerally experiential; viewers walk right in (adults had to be invited, children did so completely on their own).

Engaging with works of contemporary art can be a baffling, frustrating or joyful experience for many viewers. The quality of experience depends on several factors including the viewer's previous experiences and openness to uncertainty. University of Exeter researchers, Ian Sutherland and Sophia Acord write, "It is through [viewer]self-examination that the artwork unlocks a subjective process of knowledge production, extending the space between the viewer and the work" (2007, p132). They go on to note that challenging audiences to bring more imagination and involvement to creative products, leads to embodied and subjective understanding and knowledge (Sutherland and Acord, 2007, p135). These comments describe the intention of the *Encounters.* We began finding participants by advertising in the following terms:

Anyone with whom these questions resonate:

- Do you ever feel shut out/alienated by a work of art?
- Do you ever feel intrigued by a work of art but don't know where to take it beyond having a feeling about it?
- Are you interested in using a work of contemporary art as a as departure point for learning about yourself, learning about others, learning about the natural and human-made worlds (past, present and future), and exploring your own creative process?
- Do you dislike contemporary art?
- Are you curious?

This call for participants, accompanied advertisements of the exhibition and resulted in a wide range of genders, professional and educational backgrounds, and ages. *The Brief Encounter* was two hours of an evening; *the Encounter* was a six and half hours on a Saturday; the *Late Encounter* was six months later, three hours on a Saturday. Each of the sessions was intentionally designed to move toward embodied and subjective understandings, not just of the exhibition but of larger issues as defined by each participant.

The scope for the full day *Encounter* began with my usual opening question, "So what am I looking at?" and moved on to the following:

Formal analysis: (Cs at work - *curiosity, connection,* and *collaboration*)**.** In the gallery, each participant participated in a silent sticky note game to carefully observe the installation work, label exactly what each sees in the parts. Then, each shared their findings with a randomly selected partner, and then the whole group. This is

Contextual analysis: (Cs at work – *curiosity, connection*, moving into *complexity*, and finally *collaboration)*. At the Esplanade in the discovery room/program room, participants randomly chose a Princess Playing Card (see Appendix 4) and used the cards along with sticky notes to write down some words that come to mind that associate with the image on the card. Then

they worked in groups of three participants to place princess cards on a large sheet of paper and cluster sticky notes around the random image. Participants then worked in groups to find commonalities, disparities, connections, and historical and cultural associations and locate these on the big sheet of paper to build a visual web of ideas and associations. The groups then took a walk around the room to view other groups' visual webs.

Interpretation: (Cs at work – *curiosity, collaboration, complexity*, moving dangerously toward *chaos*). In the discovery room the participants played a visual random input game adapted by randomly selecting one card from the Princess Playing Cards and one card from the Random Object Playing Cards (see Appendix 3 for Princess Playing Cards and Random Object Playing Cards). They used sticky-notes to write down associations between the two sets of cards or simply words that come to mind as possible *connections*. They then worked in groups of three participants to add Random Object Cards to the growing web established in step two. They discussed big ideas or big questions that might be emerging and entered these on the growing web in a form that seemed reasonable to each group. The walk-about came next then home to enter further complexities to the webs. Take a walk around the room to look at the visual webs of other groups. A whole group discussion ensued about uncertainty.

Interactive art production: (Cs at work – *creativity*, *complexity, connection, curiosity, courage*). In the discovery room**,** using a variety of media, participants began to work on visual images, then passed them around to add to the work of others. Very surprising work began to emerge.

Reflection: (Cs at work – *curiosity, connection, chaos*). In the discovery room participants went walkabout and viewed all the works leaving sticky notes behind noting *connections* and *curiosities.* Participants returned to their starting places and read their notes. Participants then took their work to a new room, set up a gallery, and worked in groups on big ideas and where the terms of engagement had taken them.

Because the day was laid out in these stages that had aspects of individual, pair, and group work, with clear goals for each, the fear of failure and reluctance to risk quickly dissipated in participants, as you will hear in *Not All Who Wander*…. By taking the time to engage with a single work of contemporary art, participants noted that they were becoming more confident in engaging with works of art in general. They were also learning more about their own creative processes, which could be applied in any field of endeavor. The underlying 7Cs used in the design of the full day fostered growth of creative confidence. The structure of the Encounters is one that I have not seen before on public programming for exhibitions.

Access: www.deborahforbes.com. *Not all who wander* … Vimeo https://vimeo.com/133116093

Commentary on *Shadow Princesses*, Interactive Installation (2013).

Shadow Princesses is an interactive installation work including video, three draped printed screens, floor mirrors, steel figures. The artifact offered in Six Published Works is the published catalogue. When viewers move through it, their shadows become part of the installation. It was exhibited in public galleries including Esplanade Art Gallery, Medicine Hat, Alberta; Art Gallery of Swift Current, Swift Current, Saskatchewan; Thames Art Gallery, Chatham Ontario, Little Gallery, Prince Albert, Saskatchewan, Brandon Art Gallery, Brandon, Manitoba. Support from the City of Medicine Hat, the Alberta Foundation for the Arts, the Canada Council for the Arts, Saskatchewan Arts Board, Ontario Council for the Arts, Manitoba Arts Board, 2007 – 2013. There were public workshops offered, by me, to accompany the exhibition.

Shadow Princesses explores the history of the notion of 'princess' as a human construct, which has somehow persisted with all its fictitious inflations into the 21st century. 'Princess' has been a major research and artmaking focus for me for many years. This is the 6th body of *Princess* work (Forbes, no date.) *Shadow Princesses* grew out of the princess work that had started in the late 1990s. Both *Infanta Projects 1 and 2,* and *Princess Mysteries* provided background for *Shadow Princesses*; *complexity* grew out of these influences. The

printed screens were created by fusing layers of images of the Velázquez Infanta Margaritas, the Bird Dress princess, murdered child beauty pageant winner, Jon Benet Ramsey, live little girls' shadows, are fused into a single image so that they read as a single image on the screens.

I asked for the help of several girl children between the ages of five years and eight years (the ages of the Infanta Margarita in several of the Velázquez portraits) if they would let me borrow their shadows for an art piece. I had five shadow models; they were full collaborators in the process of constructing the original screens. One even let me capture her laugh for the video loop (re-used in Princess and Plesiosaur). The shadows were then laser cut from 3/8-inch steel plates in the actual sizes of the models' shadows. Later in the photoshoot for the catalogue, these girl children placed themselves in the projections in ways they thought would be interesting, so that their live shadows and laser-cut steel shadows are both present. Once installed, as viewers walked through the installation, their shadows were also cast onto the screens. This provoked the *curiosity* of many children as they postured to create fanciful shadows. Very small children enjoyed the disorienting experience of looking down to see themselves in the floor mirrors. Children were *collaborators* from the inception of the piece through its installation.

Full text and image catalogue is provided in the accompanying document, Six Published Works, in the Shadow Princesses section. The catalogue includes Q and A with Curator of Art, Joanne Marion and myself, as well as an essay by Jennifer Eiserman, Professor of Art and Art Education, University of Calgary.

Commentary on *Imagination Alive! Book One* (2019)

"Just 'cuz I can't remember doesn't mean I can't imagine!" (Robert, long-term care resident; 2018).

As Executive Director of LEARN, a community adult learning council funded by Alberta Advanced Education, we mainly develop programs for adult foundational learners, in the area of family literacy. We had been thinking about developing an intergenerational program

because we had observed that there seemed to be fewer opportunities for generations to work together, as equal partners. We were also working on developing a program for seniors with dementia living in long-term care. Using the 7Cs, we moved deeply into *connection* early on and pushed into *complexity* in a short period of time. LEARN facilitators used the 7Cs to begin to look at what seemed to be missing for our elders in care?

The program that we created involves high school students and senior citizens with dementia living in long-term care facilities. The pilot of *Imagination Alive!* was so successful, we were invited to publish a book, by First Choice Publications. We then provided it free of charge to every participant, as well as public and college libraries. The publication extended the reach of the program and LEARN now has a waiting list of both high schools and long-term care residences approaching LEARN to run a twelve-week program. In 2024, we will be publishing our third book. The 7Cs were instrumental in designing the program and continuing work to improve as we go.

LEARN tries to build *creative c*onfidence in itself, as a Family Literacy organization, and in all of our participants; our creative confidence was called upon in all its 7Cs – curiosity, collaboration, complexity, chaos, connection, creativity, and courage. What could we do and how could we do it? We started with a wide net filled with *collaborators*: senior caregivers, seniors, gerontologists, City and Provincial Health Care officials, family members of persons with dementia, to name a few. We scoured the literature: Dementia and Alzheimer's Help, Global; Canadian Alzheimer's Society; International Alzheimer's Society; Montessori for Dementia, to mention a few.

Our need for *connection* research led us to the work of Anne Basting, Professor of Arts and Social Entrepreneurship at the University of Wisconsin, Milwaukee, Peck School of the Arts (Basting, 2009). Basting recognized the abilities that seniors have that are 'beyond memory'. She went on to develop a program entitled *Timeslips* which all LEARN facilitators attended. We, at LEARN, needed to *pause*, again. The question remained, where could we get a large bank of regular volunteers? We anticipated the need for two volunteers to one senior to make the provocative story questions and scribing work effectively.

Pausing in *chaos*, a group of us were just chatting about life and someone started to talk about the lack of motivation of her children in high school. A stroke of genius ended up with both these groups getting put into *connection.* These two groups moved into *curiosity;* could these two groups actually work together? Doing what? What seemed like a laughable idea of seniors with dementia and high school students (not self-selected!) writing stories together based on random photos then publishing a book, is what we decided to muster *courage* and try. A lot of planning with more Cs everywhere (teachers, schools, school boards, long term care centre directors, occupational therapists, recreation therapists, care aids, granting agencies, transportation companies) and we are now on our third book and have run the program with three high schools in classes such as drama, English, psychology, and our current favorite, an English class for high school students who hate writing and reading.

Every now and again in life, we encounter something that exceeds all expectations, which makes us all feel more alive, which helps us to feel more connected to others of our species. This is what continues to happen in LEARN's *Imagination Alive!* program. People from age sixteen to ninety-six work together to build amazing stories and relationships, feel alive, and engage with other humans who started off as strangers. The word 'joy' keeps coming up when IA! is in conversation.

History has proven that new ideas and concepts are often met with ridicule, or even hostility, often directed at the creators of original ideas and design. *Imagine Alive!* was not originally met with hostility but was met with heavy skepticism from some quarters; teenagers were not going to want to sit around with old people with dementia. Willingness to let go of certainties and think expansively requires courage; courage to repeatedly fail, courage to play, courage to make discoveries, to release projects into the wild while carefully observing the fertile evolution.

The *Circle of Courage* from North American Indigenous nations, as explained by Brendtro, Brokenleg, and Van Bockern (1990), includes essential qualities of generosity,

belonging, independence and mastery in an interdependent circle. If any of the quadrants are out of balance, *courage* is weakened. The interdependent 7Cs ideally exist in a similar circle; the qualities have no hierarchical order, yet they support each other. *Imagination Alive!* lives in the Circle of Courage.

Figure 17. Circle of Courage (johansonconsulting.ca, no date).

Chapter 5:

Conclusion: Uncharted Territory and the Significance of My Work

Sailing the 7Cs in many contexts is my life's work; it guides my ongoing research and creative practice. Consciously and intentionally sailing the 7Cs helps to support our planet, fauna, flora, artists, designers, students, colleagues, community groups, children, our elders in true creative action, in the Anthropocene Epoch. Mining the past and present of all histories (animal, plant, the earth, the universe) to better understand and sustain our tiny blue planet, keeping deeply connected with processes of nature, as guided by Canadian Indigenous Ways of Knowing, can help us (myself and others) to stay present in an ongoing present. This ongoing present houses many degrees of extinction from which we can continuously learn.

This Commentary, and the accompanying document, Six Published Works, seek to bridge gaps in methodologies, and hence methods, for building creative confidence in the Anthropocene Epoch. Creative confidence includes the ability to define and solve problems in new ways, to think and explore expansively, to create and build, to know that humans are only one of many species with which we share the planet. Throughout my extensive career as an artist and college instructor/lecturer, I have actively explored diverse methodologies to enhance the creative abilities of artists, educators, and students and have honed and tested the 7Cs to a point that I feel confident they can work to bridge a gap stuck in human exceptionalism.

Six Published Works and this Commentary elaborate and illustrate the origins and potential of inclusive, circular processes (methods) denoted as the 7Cs (curiosity, connection, collaboration, complexity, chaos, creativity, courage), rooted in Indigenous methodologies of story and image that I use with care and gratitude, in all my work. As demonstrated in the Six Published Works (Document 2), using the 7Cs to build creative confidence in humans from early childhood to elderly, to expand curiosities in all of us living in the Anthropocene, is a

new contribution to knowledge. A flexible, circular system that makes space for wandering, for story and image, to forge a commitment to contribute to meaningful change in how we learn and create. Increasingly mechanistic approaches to teaching, learning, and making, that include more highly concrete and prescriptive approaches will only diminish creative risk. With demands of the changes happening to our earth and beyond in the Anthropocene Epoch (see Chapter 3), nimble, creative confidence to approach challenges yet unforeseen, will be essential for survival of the planet and many species that share it.

I shall close this Commentary with a traditional phrase from North American Indigenous World Views that reminds us as humans, we are part of a much larger universe (Kainai Board of Education, 2004).

All my relations.

Notes

[1] The Lorenz attractor is an example of a strange attractor. Strange attractors are unique from other phase-space attractors in that one does not know exactly where on the attractor the system will be. Two points on the attractor that are near each other at one time will be arbitrarily far apart at later times. The only restriction is that the state of system remain on the attractor. Strange attractors are also unique in that they never close on themselves — the motion of the system never repeats (non-periodic). The motion we are describing on these strange attractors is what we mean by chaotic behavior (Bradley, 2010).

[2] Eurocentrism is generally defined as a cultural phenomenon that views the histories and cultures of non-Western societies from a European or Western perspective. Europe, more specifically Western Europe or "the West," functions as a universal signifier in that it assumes the superiority of European cultural values over those of non-European societies (Pokhrel, 2011).

[3] Colonialism: a practice of domination, which involves the subjugation of one people to another (Kohn and Reddy, 2023).

[4] Anthropocentrism literally means human-centered, but in its most relevant philosophical form it is the ethical belief that humans alone possess intrinsic value. In contradistinction, all other beings hold value only in their ability to serve humans, or in their instrumental value. From an anthropocentric position, humans possess direct moral standing because they are ends in and of themselves; other things (individual living beings, systems) are means to human ends. https://www.sciencedirect.com/topics/social-sciences/anthropocentrism

[5] "The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p38).

[6] *The Princesses and Plesiosaur* tour to other public galleries in Canada was postponed during Covid and eventually cancelled as most galleries were closed to the public (2020 – 2022).

[7] Chaos theory describes the concepts of attractors and attractor basins where the trajectories of dynamical systems tend to converge towards attractors even with different initial starting conditions (Lorenz, 1995).

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Appendix 1

Beginnings of Story and Image: Lived Experience

Train Travel: Childhood Wonder

This story I am telling situates my learning as a reflective practice over a very long time. As a very young person, I traveled on trains from one side of Canada to the other. My father was an executive with Canadian Pacific Railways so I could get free passes on the trains. I loved to travel alone. It takes four days, moving day and night, to travel east-west and west-east across Canada. Processing the passage of time on the train at night was different from the day. Nights were years long. Night travel was my favorite; dark skies with heaven's dots vibrating above forest or mountains or prairies or lakes. I can surface few memories of cities from trains. Sometimes, as a family, we travelled in an antique private car hitched to the end of a long passenger train. In the private car, I was enveloped in warm mahogany, looking out into translucent landscapes. I think the glass in the windows was old and wavy cylinder glass. Over time, I came to know this as a huge privilege enjoyed by few other children; at the time, I just lived it. I frequently replay memory sequences from these trips. Inside the experiences there is no linear history; these experiences could have been in their real time or a hundred years before. In addition to the view rushing by the window (sometimes it seemed as if the train was stationery and the landscape was moving), I can easily conjure the cadence of the wheels on the tracks, the trains' lonesome whistles, and feel the rocking motion while walking the halls and aisles. Later in life, I was captured by Russian Constructivist, Vladimir Tatlin, and his notion of *Speech of Materials (Faktura)* (Rowell, 1978, p91). I suddenly recognized that every bit of matter that makes up every physical entity in the world, every molecule, has a history on the planet and speaks with its own voice. When I was struck with the notion of Faktura, every bit of physical matter started to shout at me! Rock, wood, steel all spoke in different voices, for example, and the chorus helped to guide me to deepened

understandings about how absolutely everything in the world of matter (which is energy) is connected. At the time of the experience, I believe I felt every molecule of every material that went into the metal rails and wheels. It is worth noting that in Western Canada, these were assembled by Chinese labourers, who left their families and were brought to Canada to create 'a better life.'[8] As I was beginning to construct a worldview, effects of colonialism seemed to be at work everywhere I looked.

The Question Emerges: 'So, What Am I Looking At?'

Little evidence of humans in many Canadian regions invites imagination and projection of stories. On these trips, because so much of Canada is sparsely populated, I could easily imagine Indigenous peoples living on the land before colonization. I also imagined settlers coming across the country by train to find new homes in what would have appeared as a landscape of nothingness. I would sometimes change my name if I met people on the train and construct fictional identities. All of this is still present in my body – the looking, the feeling, the sounds, the smells, even the tastes. It was during these years that the question that has brought continuity to my life, came into consciousness: 'so, what am I looking at?' This directive has ruled my life as an artist and educator. I learn and relearn to look with unfettered eyes and remove fondly held assumptions.

The Sea: Larger Than Oneself

Later, as a teenager and young adult, I worked the spring/summer fishing seasons on packing boats off the Pacific West Coast of Canada. Ocean Fisheries was a family company that, sometimes, hired nieces, nephews, and cousins as deckhands and cooks. My capacity for wonder had been heightened on the trains; it grew to new heights on the boats. I knew time and space to be part of something much larger than myself, or humans in general. I was in close touch with the elements and other species. Notions of human exceptionality, which were never particularly strong in me, were increasingly on the wane.

We travelled up the straits between Vancouver Island and the British Columbia mainland, sometimes even farther to Hecate Straits and Haida Gwaii, on sixty-foot boats with crews of three or four, occasionally five. After fishing openings were set by the Canadian Department of Fisheries (for certain areas and limited times), fishing boats would get a catch, deliver fish to transfer to the packing boats. When the packing boats (us) were full, we would deliver the fish down to the packing plants in Vancouver. Endless cranking and groaning of booms and winches (Tatlin's *Speech of Materials*, again), slippery deck surfaces, wild rocking, shoveling and piking fish into the hold, dressing with layers of ice – as boat after boat pulled up alongside to unload then rush back out to continue to fish. One scene in particular, in all its mental cinematographic glory, lives in my memory: dark night, no moon, boats everywhere circling for delivery of a huge herring catch, boat lights flickering on the inky water, water boiling and roiling with herring, catch after catch being weighed, totals being added and paid out in cash, counted out from a gym bag at my feet. Alone, I would have carried that gym bag filled with maybe $60,000.00 CDN cash, down the docks after midnight in Vancouver to load up before heading for the fishing grounds.

Karl Douglas Vick. 1970-80. Photograph. Where the journey begins. Vancouver, Campbell Avenue fish docks.

The fish went from live beings to cash commodity. Anna Tsing (2015, p76) talks about "alienated goods;" other species, "converted to capitalist forms of value." I distinctly

remember the distancing, as if shedding senses, in order to do my job. Watching the fish stocks dwindle over the next fifty years, that brought us further into the human produced carelessness of the Anthropocene, breaks my heart. Remembering the Orca (Killer Whales) and dolphins playing with the boats, leaping across the prow, and then waiting for the boat to catch up; watching seals and sea lions basking on rocks, laughing their heads off - these are amongst the coastal populations that are today suffering from pollution and shrinking food supply.

The Pause: The Beginnings of a Recognition

Another live-action memory-movie was a storm, again, at night. There were huge winds and the resulting huge waves. We had turned around broadside to the waves to help another smaller fishing boat that was in trouble. I think they had lost engine power, and we were trying to hook up a tow line. Waves that appeared to be several stories tall would rise up like walls, pause, and then come crashing down onto the deck and crew. Each wave, more solid than liquid, would flatten us to the deck. I can still see the 'pause.' 'Pause' has become vital to all my work. There is an important pause before, 'so, what am I looking at?' Without the pause, without honouring a little discomfort (or excitement) of uncertainty, assumptions are made. Assumptions lead to certainties; certainties can camouflage possibility and lead to "presumptive conclusions" (Gross, 1907)[9] which can close down an entire creative exploration. Interestingly, medical fields are increasingly using the notion of a 'pause', for instance, because it has been found to reduce the risk of error in high stress situations (Lee et al., 2021). In my world the pause exists in human and non-human-made circumstances; nothing moves, thoughts and feelings suspend, the 'pause' almost exists out of time. It is a strange time in which ideas begin to settle and reveal themselves without conscious intrusion.

We travelled up and down the coast, tucked into Indigenous villages, talked with the fishers, looked at artefacts being made, or ones made long ago. 'So, what am I looking at?' drew me to question everything I had been taught in school about primitive, end-of-life-nations that residential schools would solve by dragging the children, brutally stripped of family, language, and culture, into the life of the colonizers in the 20th century. 'So, what am I looking at?' told a very different story. For instance, the Ethnology collection at the Victoria Museum (Victoria, British Columbia), of which my cousin, Peter McNair was curator, opened its back rooms (Peter had the keys) so I could spend time with Chilkat ceremonial robes/blankets, woven originally by Tsimshian peoples and then adopted by the Tlingit, Haida and other coastal peoples. The sophistication of the designs, the exquisite crafting, which symbolically interpreted family heritage, important ceremonial, and historical events - took my breath away. I have spent endless hours immersed in art collections in many cites of the world always asking, 'so, what am I looking at?' Story and image and story speak to me always.

A c.1880 Chilkat blanket was sold at auction by Waddington's on Friday. The Taku River Tlingit contributed to the purchase, for $38,000, and the buyers intend to bring it home to Atlin, B.C. (Waddington's). CBC News · Posted: Dec 02, 2022, 8:47 PM MST | Last Updated: December 3, 2022

Birth of a Method: The Cs Begin to Organize

Through marine experiences that were often life and death, I learned *courage* (pay acute attention and deal with it); I learned to be *curious* about everything, always (no telling

when presence of sea jellies gives information about important currents); I learned the essential importance of *collaboration* for survival (with other humans, with other species); I learned that *creativity* must be unleashed in order to deal with constantly changing conditions that require solutions with whatever meagre tools are on hand; most profoundly, I learned that absolutely everything is *connected*. I learned that expanding *complexity* is not something to be feared or avoided but a necessary state on the way to *chaos* from which order emerges. Over time, these became my 7Cs/Seven Seas that convey methods for vast, fluid, and ever-changing realms of adventure and creative life.

Traveling on trains and working on boats, allowed me to look at land and everything living on/in it, from a distance, and from very close up. I am grateful for my early life experiences that continue to assemble themselves into a method for living, a philosophy of being, to help to build creative confidence, and conscience, in all that I do.

Learning to use, 'so, what am I looking at?' as my operational phrase, learning to value circularity that exists in everything, fueled my fledgling art life, and has provided a foundation for my life's work as an artist and educator. My contribution to knowledge started in experiences that now reverberate through everything I do. My work as an artist teaches me repeatedly what I am interested in. My interests vary and shift, but nature and prehistory always seem to have a voice in whatever I am exploring. My most recent installation work, *Sea Jellies: Next Generation,* is an immersive exploration of the endless adaptability of one of the oldest species on earth and how we humans might learn from it. My work as a college educator helps me to help others to find the creative confidence to authentically find work that pulls together their many known and fledgling interests in many fields of endeavour, in a world that is beautiful, and complex, often painful, and humourous.

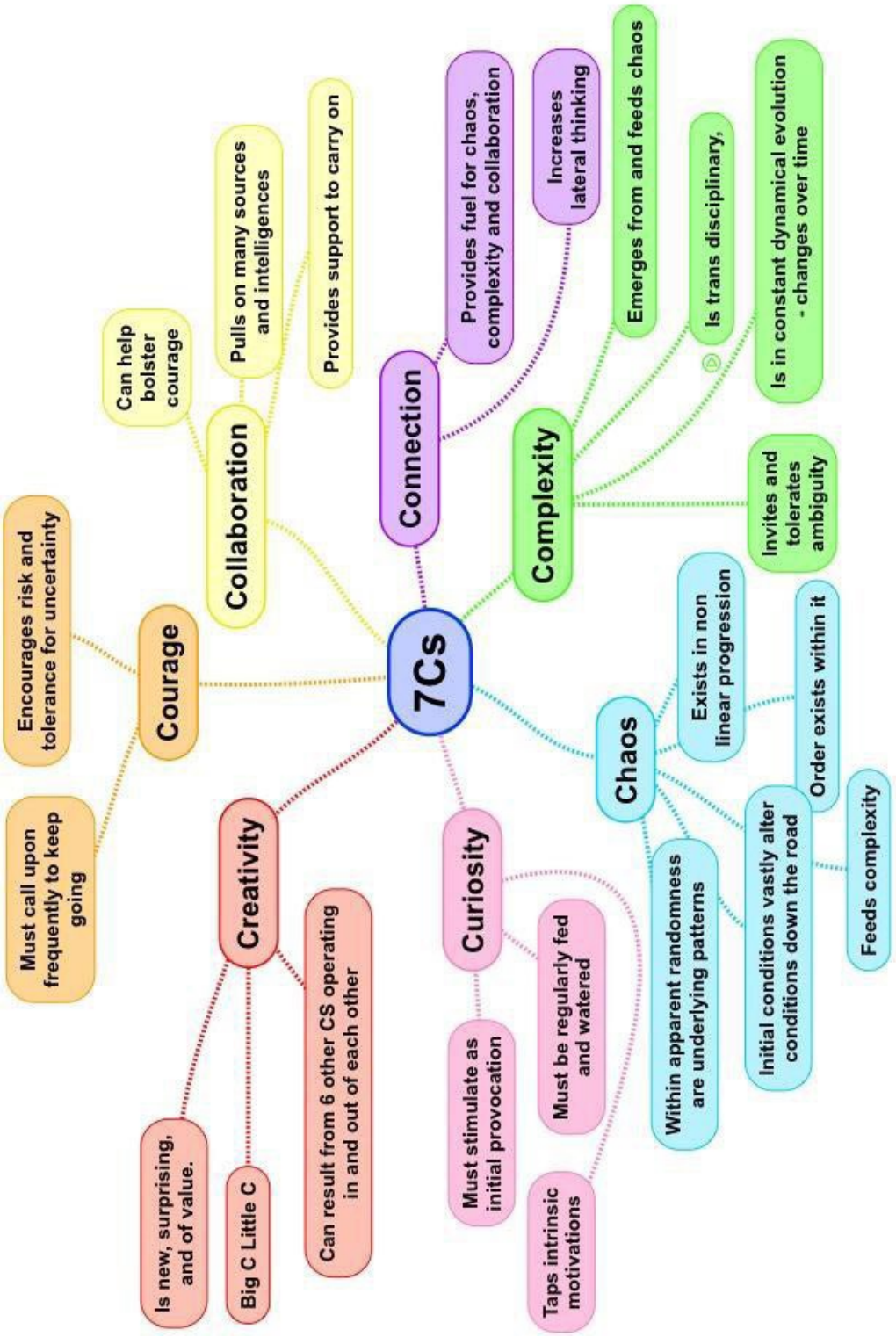
Notes

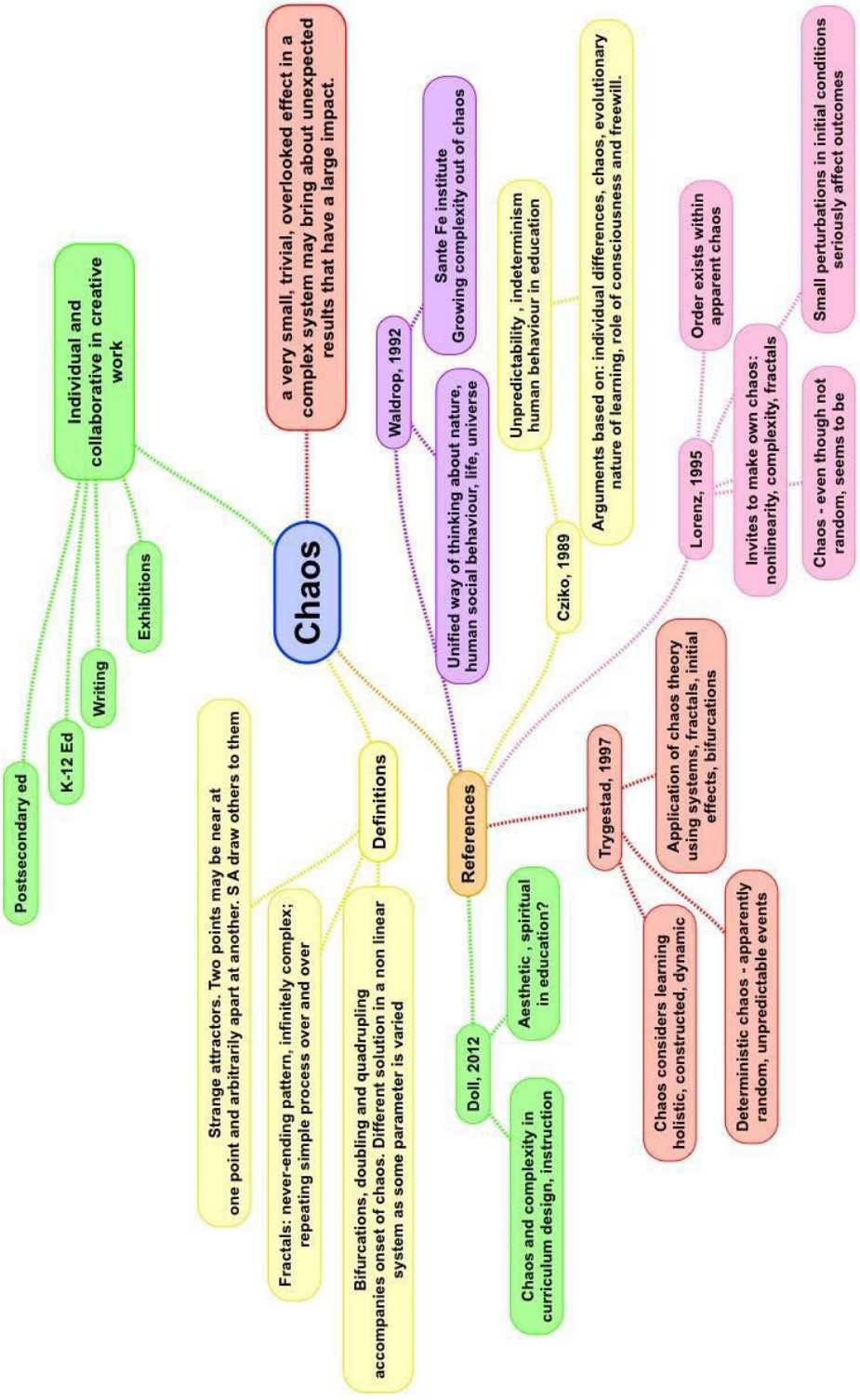
[8] Chinese workers (Coolies) were paid $1.00 a day, and from this $1.00, they had to pay for their food and gear, and perform the most dangerous tasks. White workers were paid $1.50 to $2.50 per day and did not have to pay for provisions (Government of British Columbia, 2017).

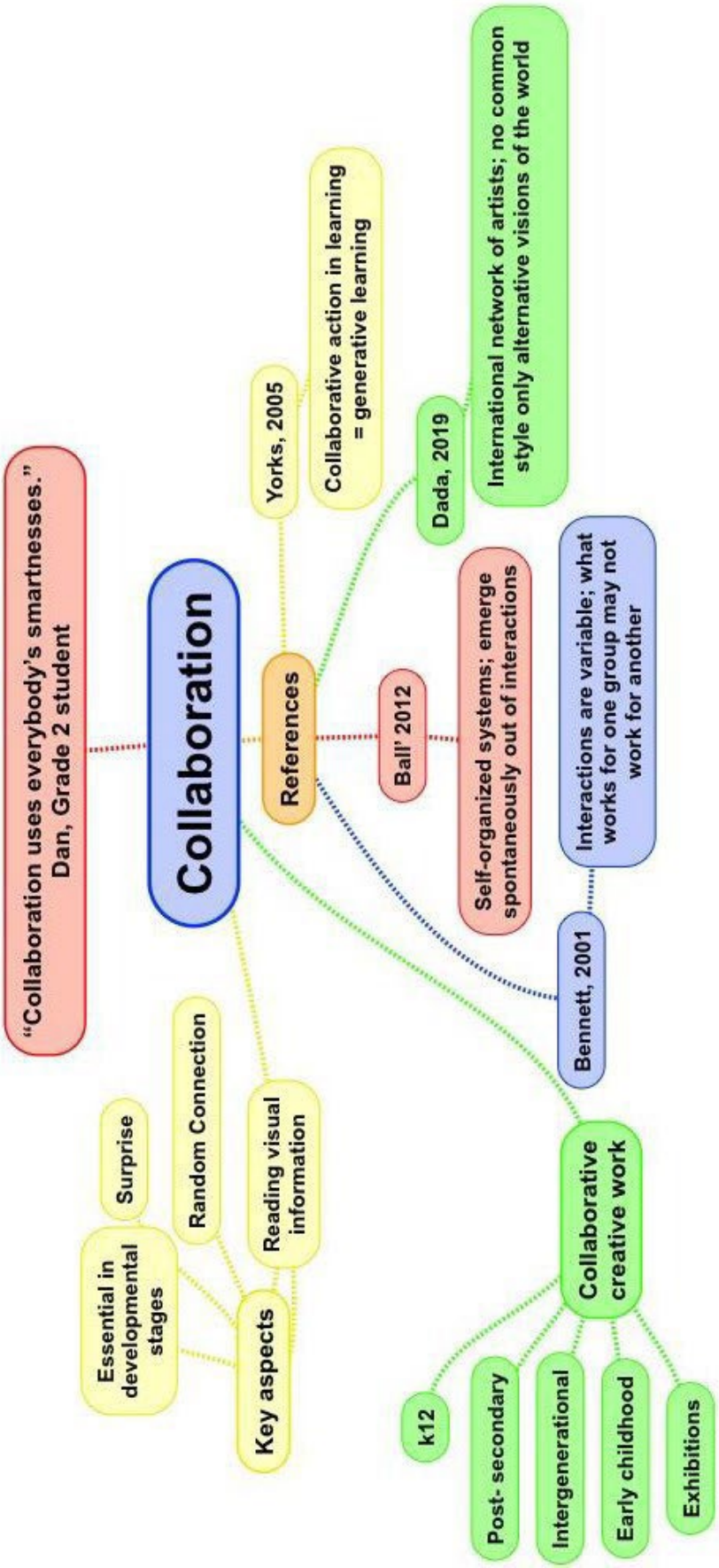
[9] Hans Gross. (26 December 1847 – 9 December 1915). Austrian criminal jurist and criminologist, the "Founding Father" of criminal profiling, scientific criminology. *Wrote System der Kriminalistik* (1907).

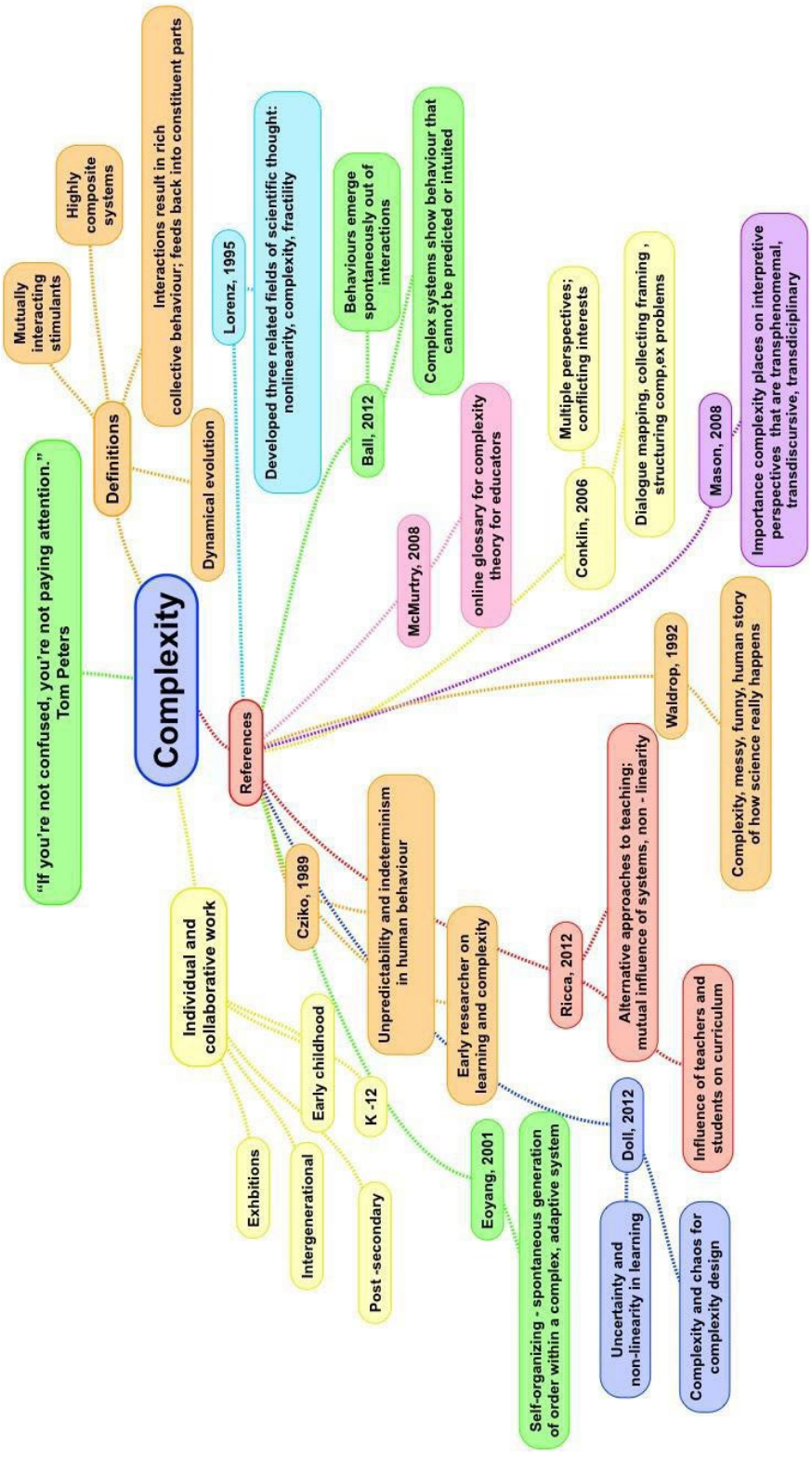
Appendix 2

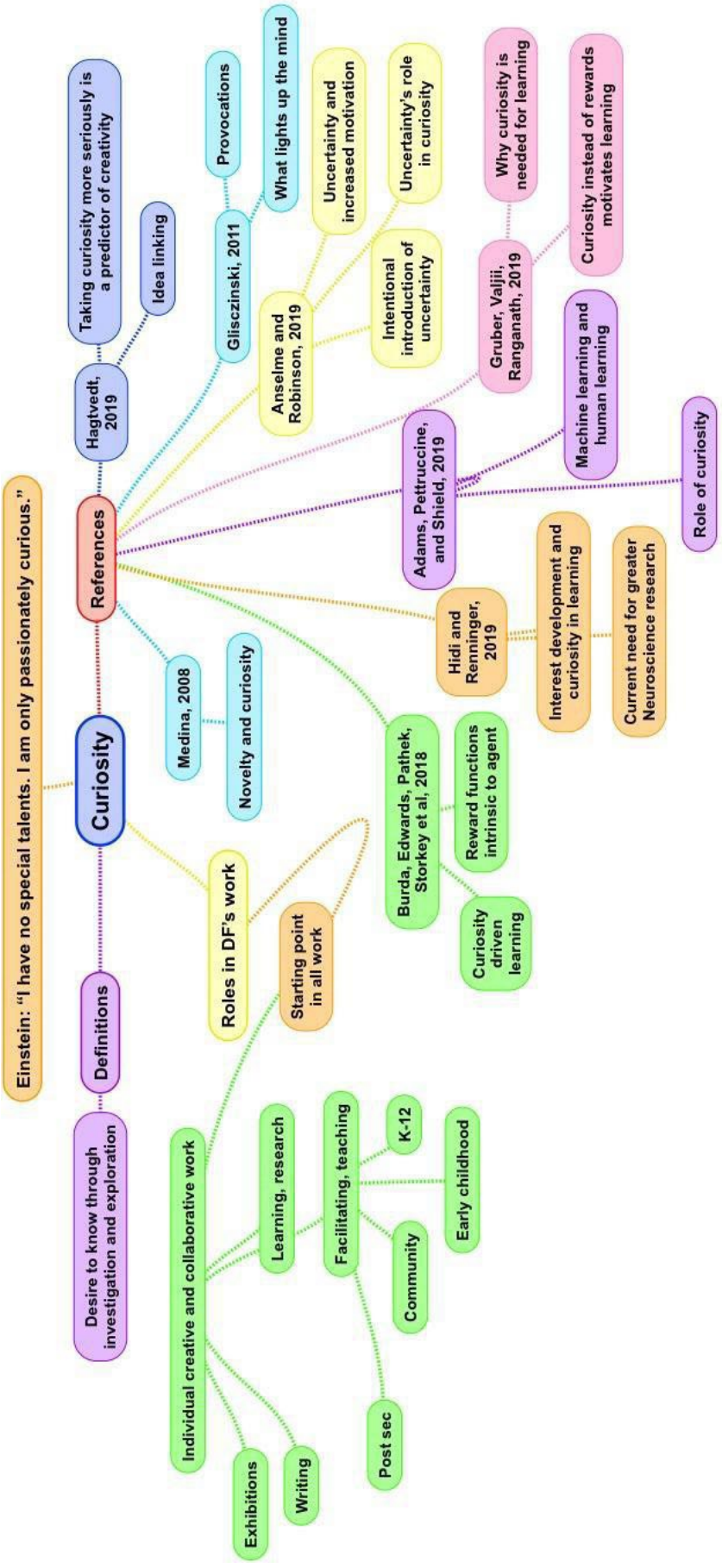
7Cs Graphic Bibliographies for References Used in Published Works

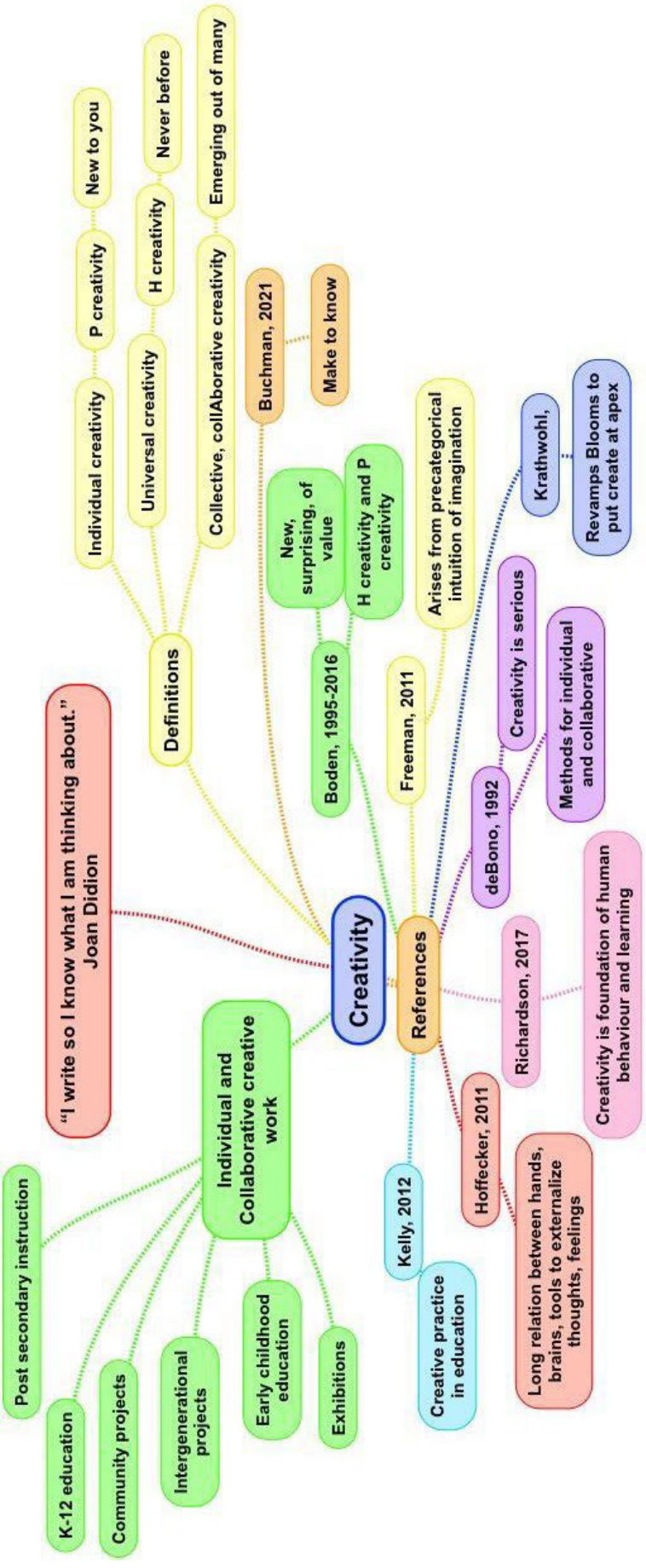


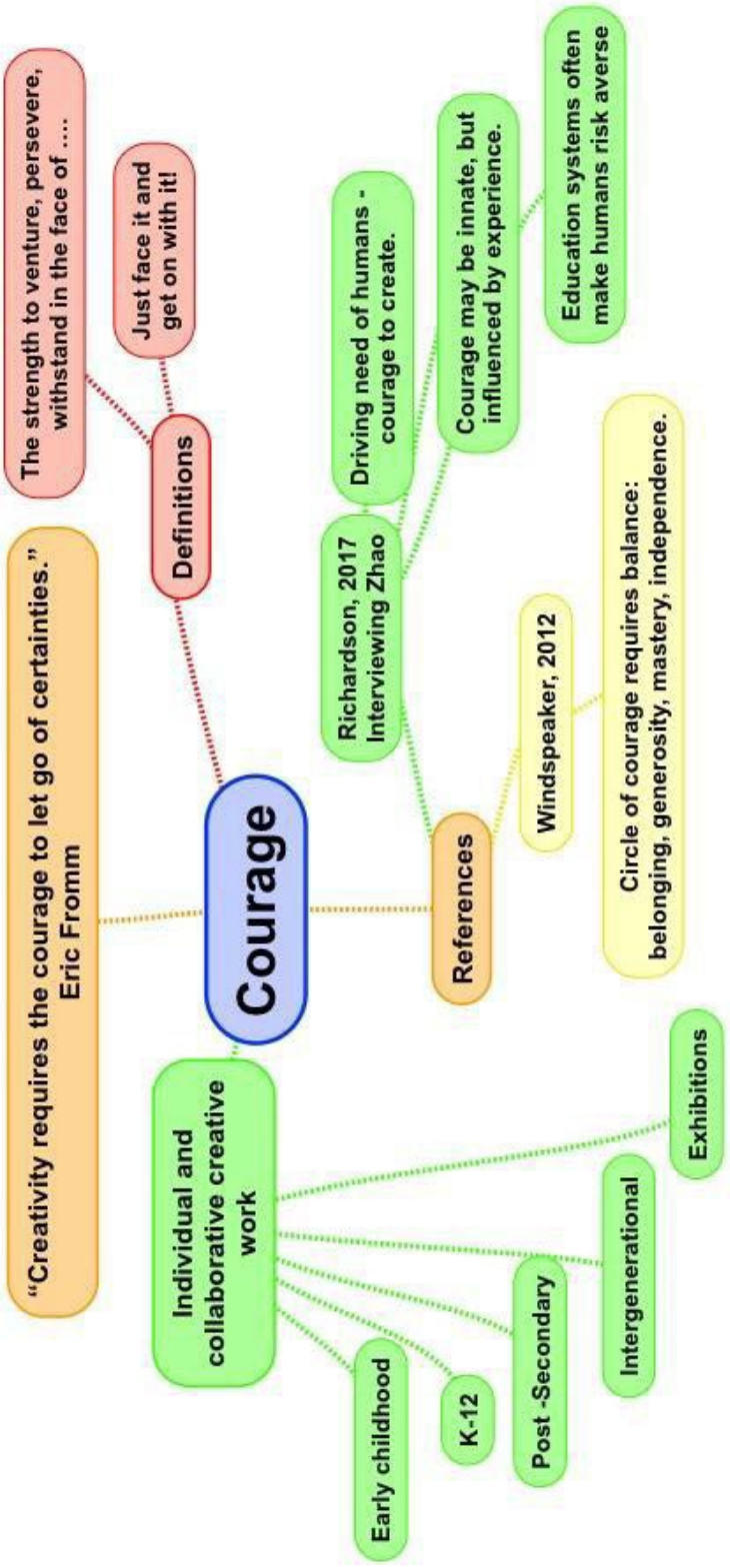

Chaos
a very small, trivial, overlooked effect in a complex system may bring about unexpected results that have a large impact.
Individual and collaborative in creative work
Postsecondary ed
K-12 Ed
Writing
Exhibitions
Definitions
Strange attractors. Two points may be near at one point and arbitrarily apart at another. S A draw others to them
Fractals: never-ending pattern, infinitely complex; repeating simple process over and over
Bifurcations, doubling and quadrupling accompanies onset of chaos. Different solution in a non linear system as some parameter is varied
References
Doll, 2012
Aesthetic , spiritual in education?
Chaos and complexity in curriculum design, instruction
Trygestad, 1997
Application of chaos theory using systems, fractals, initial effects, bifurcations
Chaos considers learning holistic, constructed, dynamic
Deterministic chaos - apparently random, unpredictable events
Waldrop, 1992
Sante Fe institute
Growing complexity out of chaos
Unified way of thinking about nature, human social behaviour, life, universe
Cziko, 1989
Unpredictability , indeterminism human behaviour in education
Arguments based on: individual differences, chaos, evolutionary nature of learning, role of consciousness and freewill.
Lorenz, 1995
Order exists within apparent chaos
Invites to make own chaos: nonlinearity, complexity, fractals
Small perturbations in initial conditions seriously affect outcomes
Chaos - even though not random, seems to be

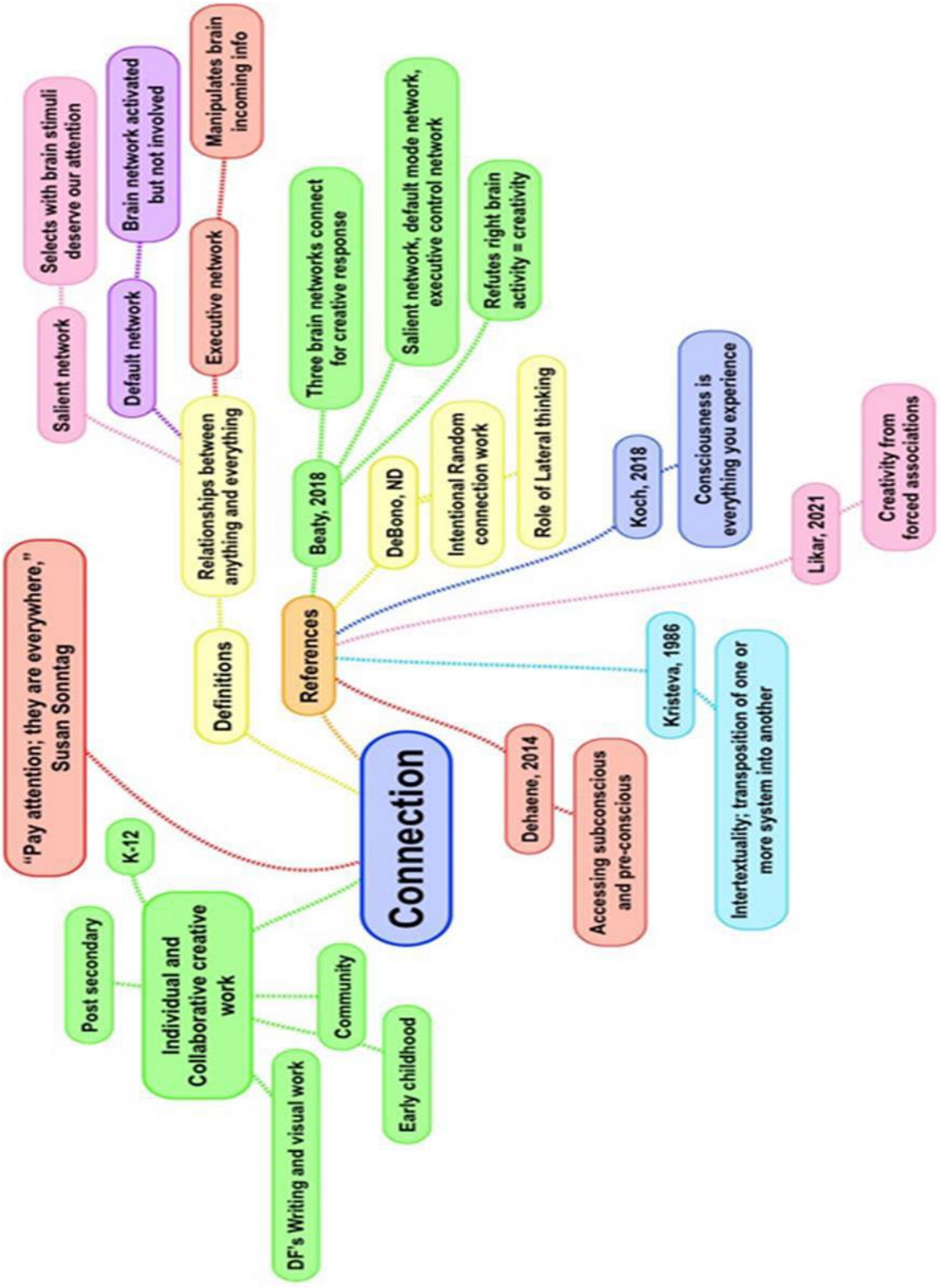

"Collaboration uses everybody's smartnesses."
Dan, Grade 2 student
Collaboration
References
Yorks, 2005
Collaborative action in learning = generative learning
Dada, 2019
International network of artists; no common style only alternative visions of the world
Ball' 2012
Self-organized systems; emerge spontaneously out of interactions
Bennett, 2001
Interactions are variable; what works for one group may not work for another
Key aspects
Reading visual information
Random Connection
Essential in developmental stages
Surprise
Collaborative creative work
k12
Post- secondary
Intergenerational
Early childhood
Exhibitions


Complexity
"If you're not confused, you're not paying attention."
Tom Peters
Definitions
Mutually interacting stimulants
Highly composite systems
Interactions result in rich collective behaviour; feeds back into constituent parts
Dynamical evolution
References
Lorenz, 1995
Developed three related fields of scientific thought: nonlinearity, complexity, fractility
Ball, 2012
Behaviours emerge spontaneously out of interactions
Complex systems show behaviour that cannot be predicted or intuited
McMurtry, 2008
online glossary for complexity theory for educators
Conklin, 2006
Multiple perspectives; conflicting interests
Dialogue mapping, collecting framing , structuring comp,ex problems
Mason, 2008
Importance complexity places on interpretive perspectives that are transphenomemal, transdiscursive, transdiciplinary
Waldrop, 1992
Complexity, messy, funny, human story of how science really happens
Individual and collaborative work
Exhbitions
Intergenerational
Post -secondary
Early childhood
K -12
Cziko, 1989
Unpredictability and indeterminism in human behaviour
Early researcher on learning and complexity
Eoyang, 2001
Self-organizing - spontaneous generation of order within a complex, adaptive system
Ricca, 2012
Alternative approaches to teaching: mutual influence of systems, non - linearity
Doll, 2012
Uncertainty and non-linearity in learning
Influence of teachers and students on curriculum
Complexity and chaos for complexity design


Einstein: "I have no special talents. I am only passionately curious."
Curiosity
Definitions
Desire to know through investigation and exploration
References
Taking curiosity more seriously is a predictor of creativity
Hagtvedt, 2019
Idea linking
Provocations
Glisczinski, 2011
What lights up the mind
Uncertainty and increased motivation
Anselme and Robinson, 2019
Uncertainty's role in curiosity
Intentional introduction of uncertainty
Why curiosity is needed for learning
Gruber, Valjili, Ranganath, 2019
Curiosity instead of rewards motivates learning
Machine learning and human learning
Adams, Pettruccine, and Shield, 2019
Role of curiosity
Medina, 2008
Novelty and curiosity
Hidi and Renninger, 2019
Interest development and curiosity in learning
Current need for greater Neuroscience research
Roles in DF's work
Starting point in all work
Burda, Edwards, Pathek, Storkey et al, 2018
Reward functions intrinsic to agent
Curiosity driven learning
Individual creative and collaborative work
Exhibitions
Writing
Learning, research
Facilitating, teaching
Post sec
Community
K-12
Early childhood


Creativity
"I write so I know what I am thinking about."
Joan Didion
Definitions
Individual creativity
P creativity
New to you
Universal creativity
H creativity
Never before
Collective, collAborative creativity
Emerging out of many
Buchman, 2021
Make to know
New, surprising, of value
H creativity and P creativity
Boden, 1995-2016
Freeman, 2011
Arises from precategorical intuition of imagination
Krathwohl, ...
Revamps Blooms to put create at apex
Creativity is serious
deBono, 1992
Methods for individual and collaborative
References
Individual and Collaborative creative work
Post secondary instruction
K-12 education
Community projects
Intergenerational projects
Early childhood education
Exhibitions
Kelly, 2012
Creative practice in education
Hoffecker, 2011
Long relation between hands, brains, tools to externalize thoughts, feelings
Richardson, 2017
Creativity is foundation of human behaviour and learning


Courage
"Creativity requires the courage to let go of certainties."
Eric Fromm
Definitions
The strength to venture, persevere, withstand in the face of ....
Just face it and get on with it!
References
Richardson, 2017
Interviewing Zhao
Driving need of humans - courage to create.
Courage may be innate, but influenced by experience.
Education systems often make humans risk averse
Windspeaker, 2012
Circle of courage requires balance: belonging, generosity, mastery, independence.
Individual and collaborative creative work
Exhibitions
Intergenerational
Post -Secondary
K-12
Early childhood


Connection
"Pay attention; they are everywhere," Susan Sonntag
Individual and Collaborative creative work
K-12
Post secondary
Community
Early childhood
DF's Writing and visual work
Definitions
Relationships between anything and everything
Salient network
Selects with brain stimuli deserve our attention
Default network
Brain network activated but not involved
Executive network
Manipulates brain incoming info
References
Beaty, 2018
Three brain networks connect for creative response
Salient network, default mode network, executive control network
Refutes right brain activity = creativity
DeBono, ND
Intentional Random connection work
Role of Lateral thinking
Koch, 2018
Consciousness is everything you experience
Likar, 2021
Creativity from forced associations
Kristeva, 1986
Intertextuality; transposition of one or more system into another
Dehaene, 2014
Accessing subconscious and pre-conscious

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Complexity

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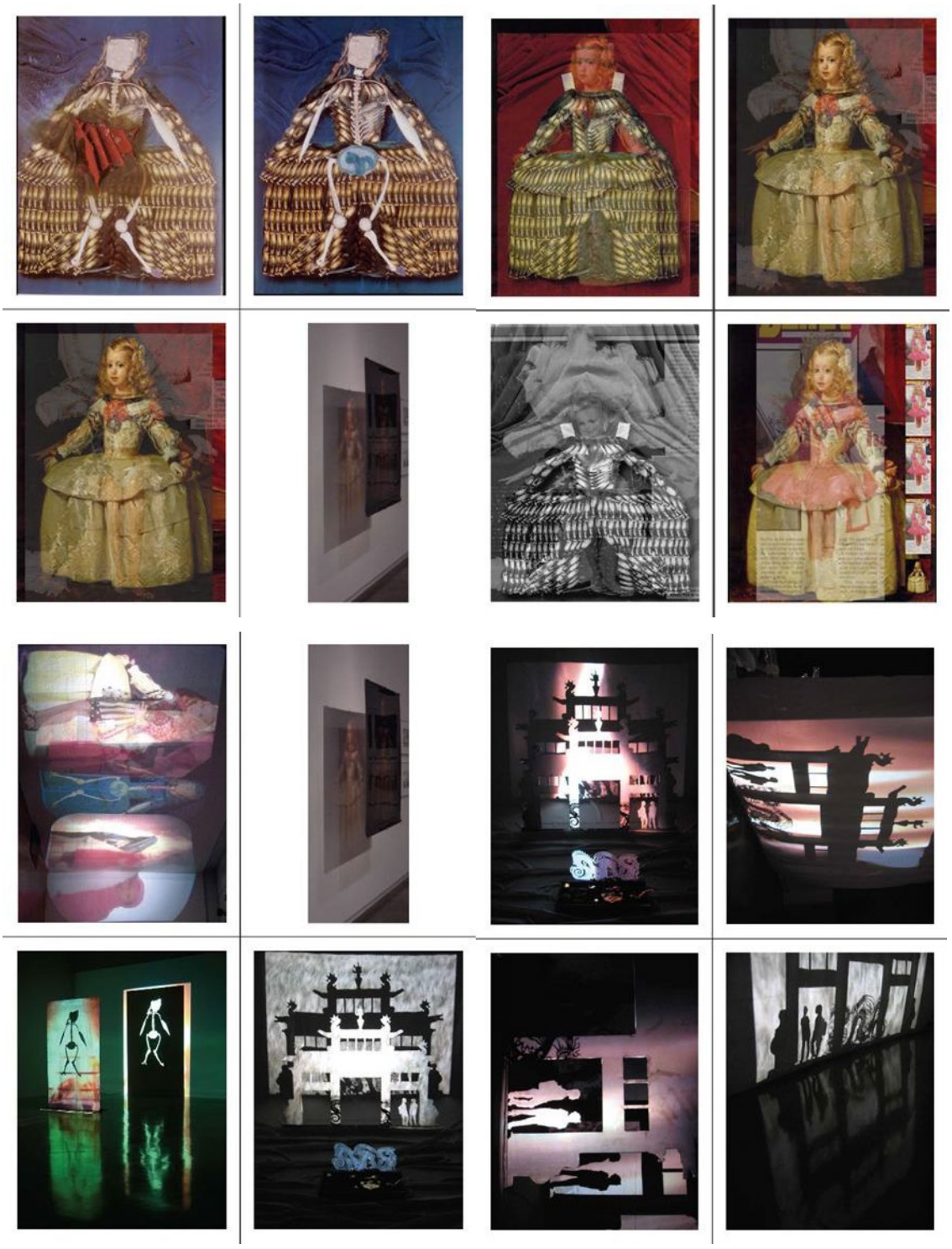
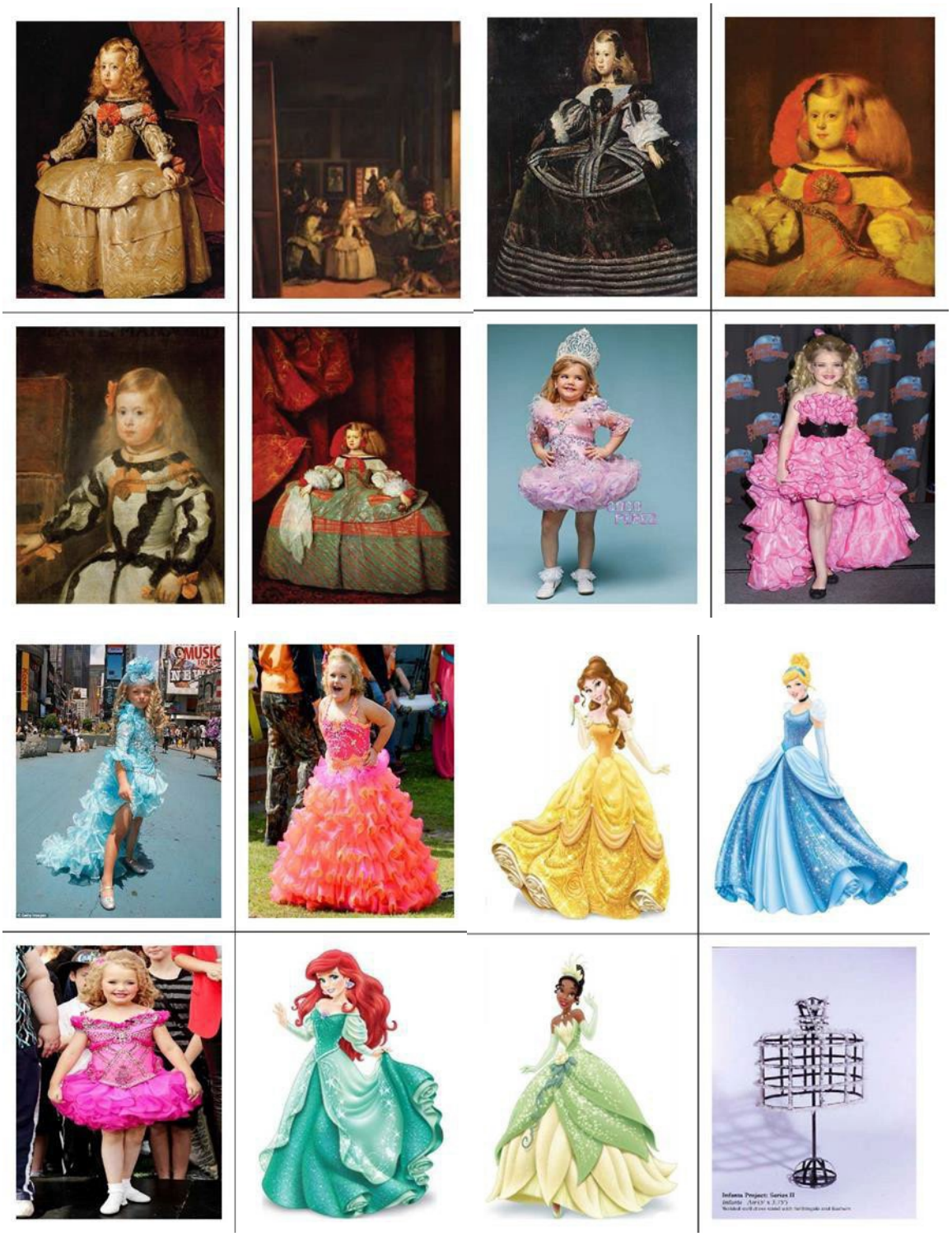
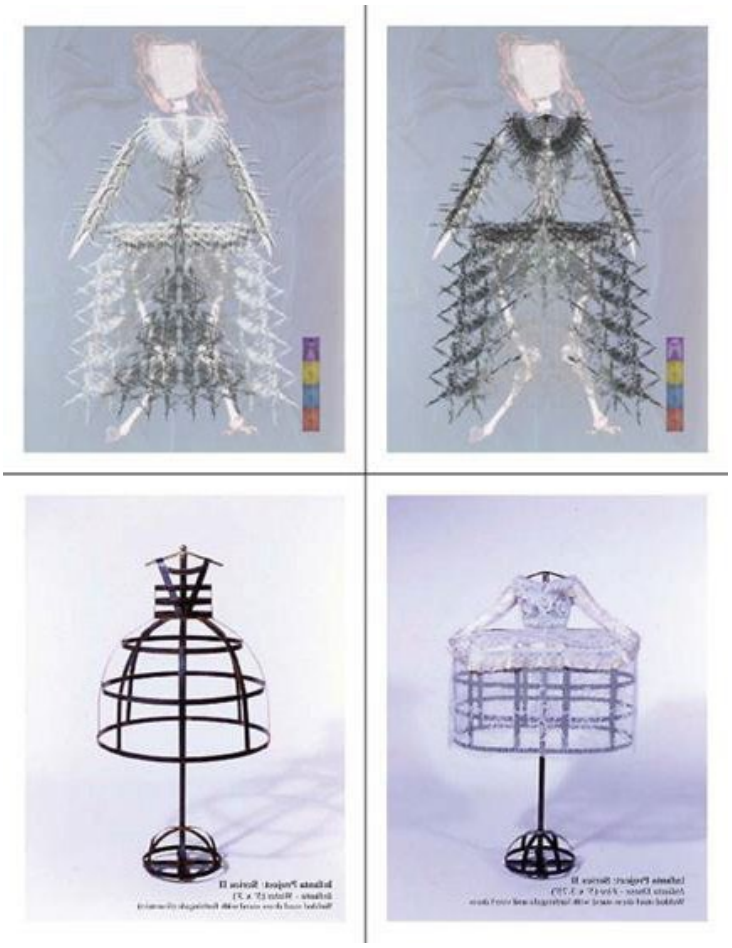
Appendix 3

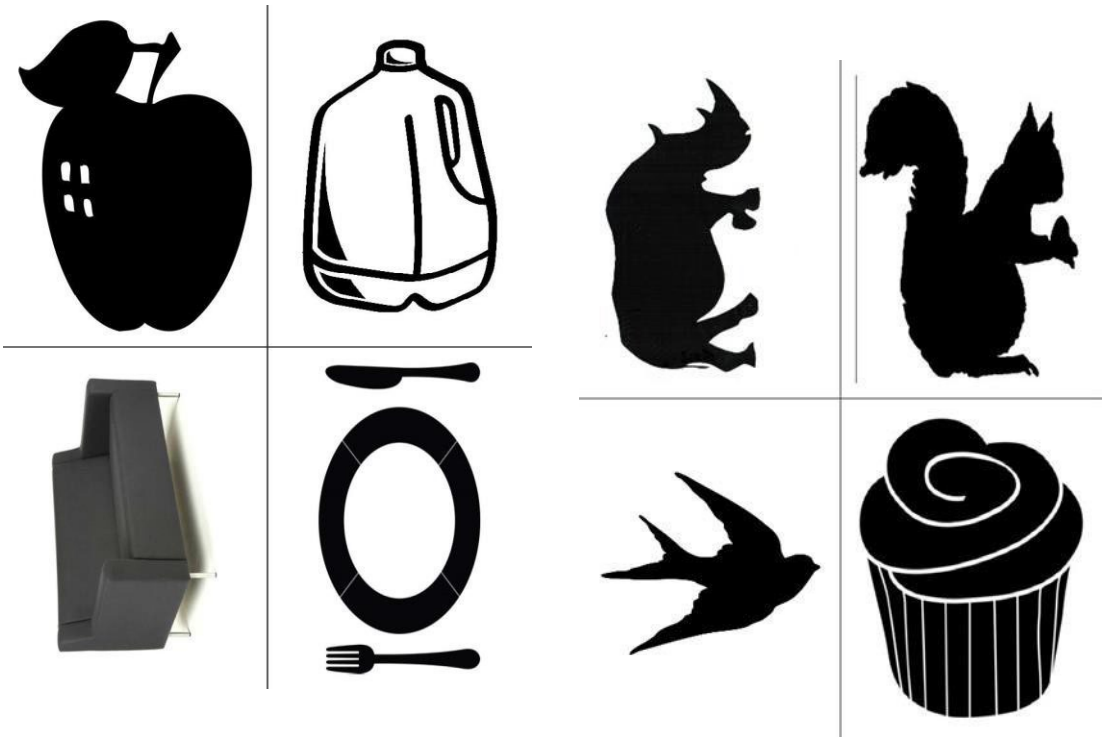
Princess Playing Cards and Random Input Cards Used in *Not All Who Wander…*

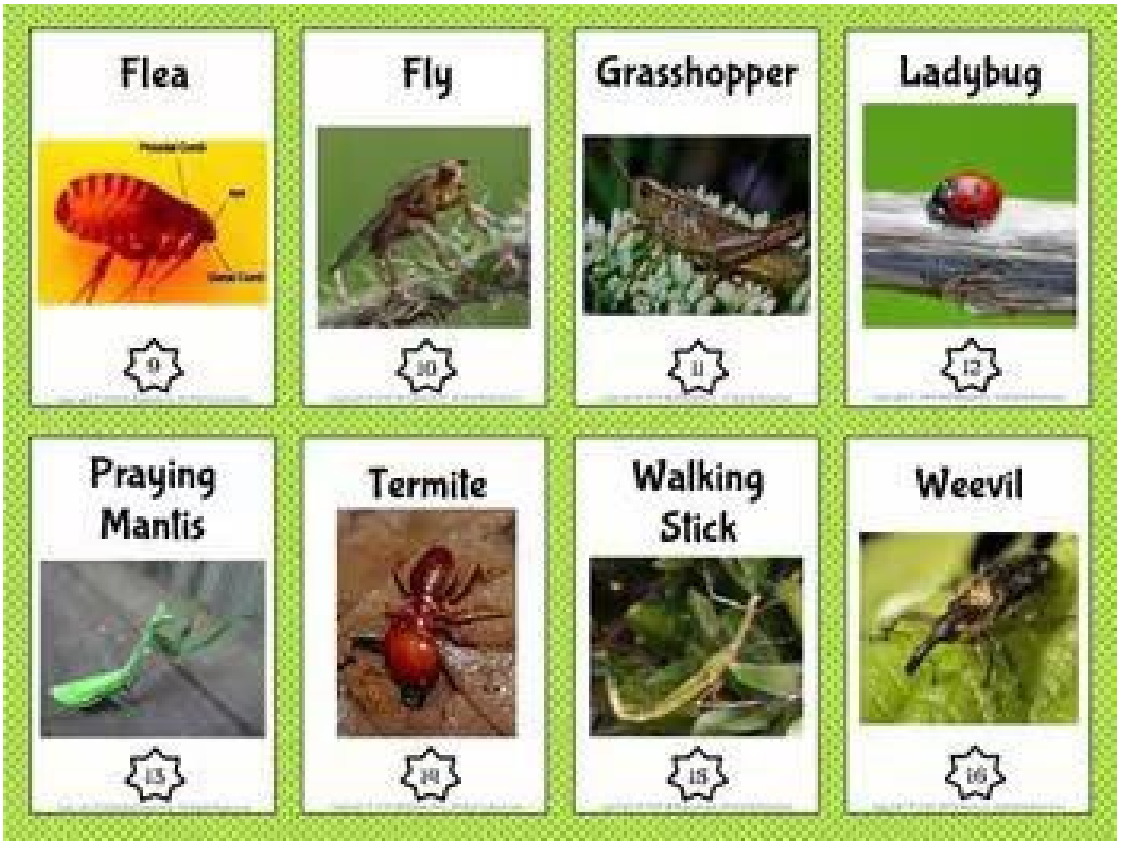






Random Input cards




Flea
9
Fly
10
Grasshopper
11
Ladybug
12
Praying Mantis
13
Termite
14
Walking Stick
15
Weevil
16

Appendix 4

Where I Am Going From Here

Sea Jellies: Next Generation is an interactive installation exhibition comprising

- Sea jelly video (courtesy of the Vancouver Aquarium)
- Original soundscape (Sakamoto/Whitley Duo)
- Laser-cut steel figures (courtesy of shadows provided by grandchildren, and produced by Jill Timushka)

Production is generously supported by a Canada Council for the Arts, Explore Create Grant, 2022.

Why Sea Jellies? Why Now?

This interactive exhibition invites participants to enter an immersive experience in the world of sea jellies. Anything is possible – children, dancers, musicians, Indigenous ceremonial dancers – all can move into flowing with the oldest still-existing species on earth: 500 million + years old. Jellies could help us to think and feel how to move out of human exceptionalism into learning from another species which, with its distributed nervous system, continues to modify and adapt to changing conditions.

Self-organizing systems can be seen all around us once we begin to look for them. We see them in the flocking of birds, the schooling of fish and the changing global ecosystem. All these things produce a form of organization in which the control is not centralized, but rather is distributed throughout an entire system. The system is dynamic, and changes arise spontaneously and frequently produces something new. Seen within this context, the human brain is the ultimate self-organizing system, and creativity is one of its most important emergent properties (Andreasen, 2011, p52)

In developing the Sea Jellies: NG, all 7Cs were continuously in use. During the five day technical set up, collaborators with different skills and backgrounds came together to

produce a working model. James Kuehn – videographer; Charles Wadman – technology expert; Zoe Smythe – photographer; Jill Timushka – welder; Sakamoto/Whitley Duo - composers/musicians. 280 677

Enjoy the 3-minute ‘teaser!’ video!

https://vimeo.com/851450713 (NB. must copy and paste into browser)

7CS IN THE ANTHROPOCENE EPOCH:

UNDERPINNINGS, PROCESSES, PRACTICES OF MOVING TOWARD CREATIVE CONFIDENCE IN ALL WE DO IN THE ANTHROPOCENE EPOCH.

Document 2

D. FORBES

PhD by Published Work

2024

7CS IN THE ANTHROPOCENE EPOCH:

UNDERPINNINGS, PROCESSES, PRACTICES OF MOVING TOWARD CREATIVE CONFIDENCE IN ALL WE DO IN THE ANTHROPOCENE EPOCH.

DEBORAH FORBES

Six Published Works in partial fulfillment of requirements of the University of Westminster for the degree of Doctor of Philosophy by Published Work.

Supervisor: Lucy Reynolds

University of Westminster

London, UK

March 1, 2024

As a Canadian settler descendant, I honour and acknowledge that I am situated on Treaty 7, and neighbour to Treaty 4 territory, treaties imposed on Indigenous lands by the Canadian Government, on traditional lands of the Siksika (Blackfoot), Kainai (Blood), Piikani (Peigan), Stoney-Nakoda, and Tsuut'ina (Sarcee) as well as the Cree, Sioux, and the Saulteaux bands of the Ojibwa peoples. I also honour and acknowledge that I am on the homelands of the Métis Nation within Regions II and III. I acknowledge all the many First Nations, Métis, and Inuit whose footsteps have marked these lands for centuries and will continue to in the present and future. I am committed to Truth and Reconciliation in thought, word, and action.

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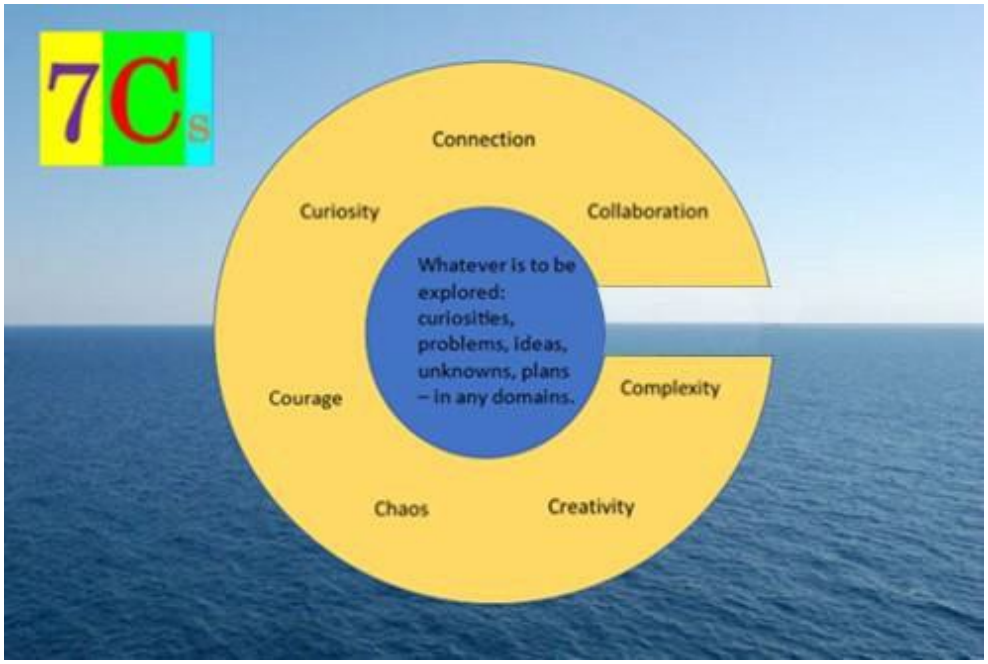

Table of Contents

AI, Andy, Alan, Algorithms, and Boden: The A's and B of Making Art with Aesthetic Meaning

Forbes, Deborah. "AI, Andy, Alan, Algorithms, and Boden: The A's and B of Making Art with Aesthetic Meaning." In *Liberal Education in the Age of Automation*. Edited by Karim Dharamsi, David Ohreen. Willington, Del. USA: Vernon Press, 2023.

NB. Paper delivered at Mount Royal University, Calgary, Alberta conference: *Liberal Education in the Age of Automation*, 2019.

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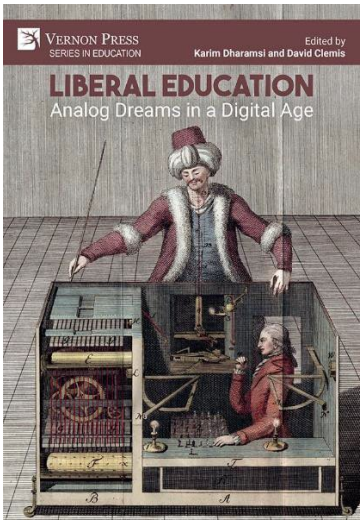

Liberal Education Analog Dreams in a Digital Age

Karim Dharamsi, David Clemis (

by Graham W. Taylor (University of Guelph), Carolyn Willekes (Mount Royal University), Ronald Peter Glasberg (University of Calgary), James Cunningham (Mount Royal University), Deborah Forbes (Medicine Hat College, Canada), Allison Dube (Mount Royal University; Canada), Rory Schacter (The University of Tokyo, Japan), Kathryn Shailer

AI, ANDY, ALAN, ALGORITHMS, AND BODEN:

THE A'S AND B OF MAKING ART WITH AESTHETIC MEANING

Proposal to University of Westminster
PhD by Published Works

Deborah Forbes

Submitted: October 2022

Introduction: Artificial Intelligence: Can it Create Art with Aesthetic Meaning?

'Nancy,' a late 19th century stage automaton, designed to be driven by a hand-crank from under the stage; she is larger than life. Made of papier-mâché, she moves her eyes and eyelids, her head turns and nods, her chest heaves, she bends at the waist, she can cross her legs and arms, and she looks like she is sewing or perhaps crocheting.[1] Nancy is a proper young female-automaton; she appears to be making something. From the automata of the 19th century, we have moved in the 21st century to digital entities that not only mimic making something, but actually seem to make new things. Yes, they are programmed by humans, but unleashed into the vast soup of digital information, these entities create products that humans have not. For example, these digital entities *may* have created something that is new, which moves beyond the intentions or expectations of human makers; they *may* even recognize creativity in their own performance, and then build on it.

'Artificial' is commonly defined as, "made or produced by human beings rather than occurring naturally, especially as a copy of something natural."[2] Does artificial intelligence (AI) do things that intend to copy human intelligence, which *is* capable of creation? Where does aesthetic meaning sit in this? If aesthetic meaning is considered to include human feelings, emotions, thoughts, engagements, and if it constitutes making sense of human experience, then what would be the role of artificial intelligence in this, beyond operating as a human directed tool? In work that has a specific end in mind, artificial intelligence far surpasses the human brain in its information processing capacities. Great works of art with aesthetic meaning to humans,

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[1] The House of Automata, "Nancy, the Automaton," May 12, 2007. Video, 0:44. https://www.youtube.com/watch?v=k_g7ISS9nFA.

[2] *Lexico (by Oxford) Dictionary, s.v.* "artificial," accessed May 26, 2020, https://www.lexico.com/definition/artificial.

however, rarely begin with a rigidly defined goal, in fact they are more often explorations of the subconscious, the unconscious, and the conscious of both the artist and the subject. For instance, Joos Van Cleve portrait of Henry V111 (c1535 CE) and the Hans Holbein the Younger (1536 CE), are clearly painted by the eyes, minds, and hearts of two very different human beings and their total experiences, to construct images that reveal very different psychologies of the subject. Given that aesthetic meaning arises from explorations of the sub/un/ and conscious dimensions of human experience, as realised in human feelings, emotions, thoughts, engagements, we might ask, can AI produce or create aesthetic meaning that humans could recognize as such?

Margaret Boden, Research Professor of Cognitive Science at Sussex University, at which she founded the School of Cognitive and Computing Sciences in 1987 (now the Centre for Research in Cognitive Science), writes, "Creativity is the ability to come up with ideas or artefacts that are new, surprising and valuable."[3] Her fifty years of research into creativity bridges the time from a world not distinctly different from the times that produced 'Nancy,' to an overwhelming world-wide-web-world filled with algorithms that regenerate and reform themselves. There is so much 'artificially' generated digital information and digital product that human brains can seem dwarfed.

Yet is there something that human brains, minds, bodies, or souls do that is distinctly different from artificial intelligence, something that holds creative identity and production of aesthetic meaning within the realm of the human maker? What is the role of consciousness in creation? Exploring the work of Margaret Boden, Alan Turing, and Andy Warhol, amongst others, this paper is a straggly exploration of human and artificial intelligences, and the capacity

[3] Margaret A. Boden, *The Creative Mind: Myths and Mechanisms* (New York: Routledge, 2004), 1.

of each to use ‘creativity’ to make meaningful artistic artefacts. To this end, it begins to explore what is aesthetic meaning, what is creative artifact, what is creativity, leans into what human consciousness has to do with any of this, and ends with a spot of fiction. Or, at least, this is where the path begins.

Think of this paper as analogous to a meander along a path in nature; many questions pop into one’s mind along the way, few are definitively answered; one can, however, expect a few opinions to be generated. The meander is one of exploration. The path winds along something like this:

Enter here: Merge onto the Path of Human Idiosyncrasy;

Encounter along the way: Ai-da, *Obvious*, *The Butcher’s Son*;

Circle back: The Messy Business of the Human Mind;

Veer off: Two Essential Biographical Tangents;

Step back on: Aesthetic Meaning, Creativity and Consciousness;

Enter a new branch-path here: Can Artificial Intelligence be Natural?;

Relax and enjoy: A Spot of Speculative Fiction.

Enter here: Merge onto the Path of Human Idiosyncrasy

This meander has had many blind alleys, false turns and near insurmountable obstructions, nested in the complexity of many questions that keep changing and adapting. How I am muddling through the journey is particularly human. It is in these very human processes themselves that a little coherency is starting to reveal itself, at least in terms of ideas that surround the key questions. In the process, I have also unearthed some critical biases in my approach; I am biased toward messy human processes as revealed in how we humans live our lives. I raise many more questions than I answer. This paper is not about finding answers.

I start with some thoughts on the convoluted complexities of human creativity, which seems inextricably linked to human consciousness, and human experience. I then backtrack into the history of art to look at how seemingly unlikely artistic developments (that were new, surprising, and of value) emerged at a particular time, and place, in human history. I do so to begin to think about how artificial intelligence could similarly perform or mimic these processes. My thinking is firmly rooted in the evolution of my species in this time and place.

I am an installation artist, an instructor of art history and art education - so everything, of course, is about humans and art and creativity. I am a huge enthusiast of chaos and complexity theories because these seem to be locations into which we humans might peer into catch glimpse of our workings. Complexity theory describes the tiny perturbations that provoke creative action in many human pursuits. Mark Mason emphasizes the importance of complexity theory in interpretive perspectives that are "trans-phenomenal, transdisciplinary, trans-discursive, that invite and tolerate ambiguity."[4] These 'trans' positions, and their necessary invitations, also describe creative processes. If we consider aesthetics as a branch of philosophy that involves critical reflection on art, culture, science, nature, as Margaret Freeman of Myrifield Institute of Cognition and the Arts states, it is one that, "provides a methodology whereby we are able to understand how art enables us to experience emotions caused by sense impressions," I wonder how 'artificial' intelligence can mimic this type of perceptual/emotional response, which seems thoroughly rooted in disorderly human consciousness, and human intention?[5] Freeman goes on

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[4] Mark Mason, "Complexity Theory and the Philosophy of Education," *Educational Philosophy and Theory* 40, no. 1 (2008): 4.

[5] Margaret Freeman, "The Aesthetics of Human Experience: Minding, Metaphor, and Icon in Poetic Expression," *Poetics Today,* 32, no. 4 (2011): page 101.

to write about how the arts should be incorporated into understandings of cognitive processes obtained through methodologies of natural sciences, as insights arise not from conceptual logic of reason but from pre-categorical intuition and imagination.[6]

One wonders how AI can imagine and intuit? If humans program AI to enter into a semblance of pre-categorical intuition and imagination, could it make art of aesthetic value that could be recognized as such by humans? If AI moves into its own unprogrammed directions, could it generate its own forms of creativity connected to its nature? These are wonderings that this paper cannot begin to answer but are important questions to keep in mind for future encounters.

To further muddy the waters, Chistof Koch, Chief Scientific Officer of the Allen Institute for Brain Science, Seattle, eloquently writes:

> Consciousness is everything you experience. It is the tune stuck in your head, the sweetness of chocolate mousse, the throbbing pain of a toothache, the fierce love for your child and the bitter knowledge that eventually all feelings will end.[7]

Keep this in mind as we return to 'artificial:' commonly defined as "made or produced by human beings rather than occurring naturally, especially as a copy of something natural."[8] Humans have an enduring fascination with the notion of machines that seem like humans; we seem to love making things that appear to be human or function as human. In all our cleverness we cannot

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[6] Ibid. .

[7] Christof Koch, "What is Consciousness?" *Scientific American* 318, no. 6, (2018): page 60.

[8] *Lexico*, "artificial."

resist doing something, for good or ill, after we have conceived of it; this seems to be a hallmark of our species.

Encounter along the way: *Ai-Da*, Obvious, "The Butcher's Son," AI, and ART!

In the 21st century, humans are still drawn to making what is essentially a sophisticated automaton, such as the humanoid artist-robot, *Ai-Da*, designed by Aiden Mellor of Leeds University. *Ai-Da* looks and sounds something like a female human and can draw what 'she' sees through her camera eyes in a variety of styles. Before the opening of 'her' first exhibition, *Unsecured Futures*, June 12 – July 6, 2019, at St. John's College, University of Oxford, human beings had spent over a million dollars purchasing the works of *Ai-Da*.[9] The miracle of *Ai-Da* seems to be that she looks like a human, can draw what she 'sees' in the styles of many different humans, and can produce drawings that sell for high prices.

I received a stronger nudge to pursue lines of thinking into current human and AI '

an Andy Warhol print and beside a bronze work by Roy Lichtenstein. On Thursday, it sold for well over double the price realized by both those pieces combined. *Edmond de* creativities' when I read this New York Times headline: "AI Art Sells for $432,500 at Christies." Cohn writes,

> Last Friday, a portrait produced by artificial intelligence was hanging at Christie's New York opposite *Belamy,* from *La Famille de Belamy*, sold for $432,500 including fees,

[9] Matthew Stock, "Ai-da, the Humanoid Robot Artist, Gears Up for First Solo Exhibition," *Reuters*, June 5, 2019. https://www.reuters.com/article/us-tech-robot-artist/ai-da-the-humanoid-robot-artist-gears-up-for-first-solo-exhibition-idUSKCN1T6215.

over 40 times Christie's initial estimate of $7,000-$10,000. The buyer was an anonymous phone bidder.[10]

The maker of this work is named *Obvious*. *Obvious* explains itself as follows: "We are *Obvious*, a Paris-based collective of artists, machine learning researchers and friends interested in AI for Art."[11] The members are Gauthier Vernier, Pierre Fautrel and Hugo Caselles-Dupré, three twenty-something friends since childhood. *Portrait of Edmond de Belamy*, was created by artificial intelligence, an algorithm defined by an algebraic formula, which appears on the work as the "artist's" signature:

$$\min_G \max_D \mathbb{E}_x[\log(D(x))] + \mathbb{E}_z[\log(1 - D(G(z)))]$$[12]

The humans at the art collective, *Obvious,* thumb their nose at Picasso's (1881-1973) popular quotation, "Computers are useless. They can only give answers," with, "Well, Picasso, it's a disagreement."[13]

Obvious lays out their process as follows: Data selection, image creation, training, and finally, production. Data selection involves selecting input images with common features with the goals of producing a new sample with shared features. This is followed by image creation for which GANs are used. A GAN is a Generative Adversarial Network, in which two networks,

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[10] Gabe Cohn, "AI Art at Christie's Sells for $432,500," *The New York Times*, October 25, 2018, https://www.nytimes.com/2018/10/25/arts/design/ai-art-sold-christies.html.

[11] Obvious, "Obvious Explained," Medium, February 14, 2018, https://medium.com/@hello.obvious/ai-the-rise-of-a-new-art-movement-f6efe0a51f2e.

[12] Ibid.

[13] Ibid.

'generator' and 'discriminator,' compete. The 'generator' creates new images by trying to fool the 'discriminator' into thinking generated images are 'real.' In this instance, 'real' could be interpreted as looking as if it were painted by a human. This is essentially a kind of Turing Test. Training involves the resolution of the generated image by enhancing using 'upscaling' algorithms that infer a higher definition version of the image. Finally, in production, the image is printed on canvas by an inkjet printer, then it is signed (with the math formula showing the relationship between the generator and the discriminator) and framed.[14]

This is an interesting process that mines more than 15,000 images from the history of western art from the early Renaissance to the end of the Modern period – no mean feat! *Obvious* does not claim to be the first to create works of art using GANS; they are simply the first to sell these for big money at Christies and therefore enter the art world at a high commercial level. With this work, *Obvious* proposes several philosophical and social questions. They write:

> Is an algorithm capable of creativity? This question has risen many times since computers have been created, but this time, with algorithms like GANs, it takes it a step further. In contemporary art, the artist has always been at the center of the work, and the tool as a way for him to express, and pass on, emotions.[15]

I would argue in talking about artistic expression, that there is a transmission of cognitive and affective content, as well as the whole tentacled web of individual and collective connections, that raise the role of consciousness in humans. Art that is supported by Boden's three-legged

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[14] Ibid.

[15] Ibid.

stool (new, surprising, and of value) triggers these indefinable responses in viewers across time and often space. *Obvious* continues:

> Here, the tool is closer to the center of the work, even though the artist behind the algorithm remains the 'real' artist. The intention and inspiration come from the human who designed and used the algorithm. Hence the collaboration between human and machine has never been so close.[16]

With this, one is given to understand that the human collective is the real artist and the algorithm is the tool the collective has chosen with which to work in close collaboration. *Obvious* goes on to write that this collaborative approach will result in the appearance of a new type of art, stating "It will definitely not replace artists, it brings up a new perspective."[17]

Regarding value, Boden's third leg in the three-legged stool of creativity, *Obvious* claims value as follows: "Rather than the artwork itself, we believe that the value of this project lies in the debate it can create, and in the exposure of this new tool to the public."[18]

In discussing the legacy of Alan Turing, R. K. Shyamasunder, computer scientist and engineer, writes, "We are still far away from building intelligent machines … computers have essentially acted as tools rather than forming new concepts."[19] To return to Boden, "Creativity is the ability to come up with ideas or artefacts that are new, surprising and valuable."[20] *Obvious* is

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[16] Ibid.

[17] Ibid.

[18] Ibid.

[19] R. K. Shyamasundar, "The Computing Legacy of Alan M. Turing," *Current Science* 106, no. 12 (2014): 1679.

[20] Boden, *The Creative Mind*, 1.

stating that 'value' is one of engendering debate, perhaps, about the nature of art.[21] This debate is not new or surprising; even in the past hundred years we have had several important and noisy debates about the nature of art itself, which significantly is at the instigation of Marcel Duchamp with his *Readymades.* Duchamp declares, "An ordinary object could be elevated to the dignity of a work of art by the mere choice of an artist."[22] The unanswered questions that *Fountain* provokes are precisely what has contributed to its conceptual underpinnings and its enduring (and confounding) legacy. *Fountain* of 1917, would appear to fall into what Boden has described as H-creativity, an idea or artefact that no one else has had before; it had arisen for the first time in human history.

Calling attention to this distinction, another of Duchamp's Readymade works, from 1915, is *In Advance of the Broken Arm*, which, interestingly, also alludes to time. The shovel is not made by Marcel Duchamp, but rather the work of art is the idea conceived, which comes from the artist.[23] If we measure Duchamp's cheeky provocation on the three-legged stool of creativity, it is indeed both idea and artifact that are new, surprising and valuable in the bellicose debate that continues to rattle on about *what is art?*

So, where are we? Duchamp, a century ago, had already moved us beyond the work of *Obvious* and of *Ai-Da* by proposing that a work of art is the human idea conceived by the artist. In Duchamp's case, this is dependent on the title, for example *In Advance of the Broken Arm* (a

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[21] Obvious, "Obvious Explained."

[22] "Dada: Discover How Artists Used Chance, Collaboration, and Language as a Catalyst for Creativity," MoMA Learning, accessed August 4, 2019, https://www.moma.org/learn/moma_learning/themes/dada/marcel-duchamp-and-the-readymade/.

[23] "Dada," MoMA Learning.

snow shovel), and *Fountain* (a urinal). *Obvious* moves us beyond 'Nancy' - from trying to make something that looks like a human, do things that look like what a human does, to something that is able to grind more data than a human can do in a lifetime, however, make something that still resembles a thing that a human might make (a 'painting' with a signature, that sells at auction). *Ai-Da* returns us to our fascination with 'Nancy' by manifesting as a humanoid female robot that makes drawings of what its camera eye sees. Duchamp, with his *Readymades*, took practical everyday objects, altered them very little if at all, gave them titles, recontextualized them, displayed them as *objet d'art*; the *Readymades* act as a starting pistol for the idea of art as concept. *Obvious* may be trying to run in that race but much less successfully.

Back to Boden, "Creativity is the ability to come up with ideas or artefacts that are new, surprising and valuable."[24] She has two categories for creativity : psychological creativity (P-creative) is something that is new to the creator; historical creativity (H-creative) is something that has arisen for the first time in history – i.e. no one has ever thought of it before.25 Neither *Obvious* nor *Ai-da* have produced artifacts that stand up to Boden's H-creative, three-legged stool. The 'paintings' (actually digital prints that have a painting-like appearance) and drawings are not new, not surprising, but do have value in monetary terms as some humans want to buy them for lots of money.

Another case of AI in art-making is *The Butcher's Son*; it won the 2018 Lumen Prize for Art and Technology, Gold Award.[26] Of this neural network's interpretation of the human form,

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[24] Boden, *The Creative Mind*, 1.

25 Boden, *Creativity in a Nutshell*. Np.

[26] The Lumen Prize, "The Butcher's Son," The Lumen Prize, 2018, https://lumenprize.com/artwork/the-butchers-son/.

artist Mario Klingeman describes the process as using an image that is built using a chain of GANS, in which two networks, generator and discriminator, compete. It begins with a randomly generated stick figure, which in turn becomes a painterly proto image. In several steps, the low-resolution image is 'transhanced' and 'upscaled' by another GAN, increasing the resolution and adding details and textures. Klingeman controls this process indirectly by training the model on selected data sets, the model's hyper-parameters, and eventually by making a curatorial choice by picking, from amongst the thousands of variations produced by the models, the one that speaks to him the most.[27] Klingman then prints the image using ink-jet printing choosing an output that looks 'painterly.'

Klingeman sets the process of 'making' in motion, makes some choices along the way, while he is no doubt sipping espresso, and ta-da! Out of the printer comes *The Butcher's Son*.

The Butcher's Son is a little like a Francis Bacon in its macabre distortions, a little like the Barbarini Faun in composition, a little like a Lucien Freud painting in its fleshy flesh-handling; if "creativity is the ability to come up with ideas or artefacts that are new, surprising and valuable," I have trouble finding a deep connection to new, surprising, or valuable in *The Butcher's Son*, but it did win a prize, so that could mean that it is valuable.[28]

Granted, one could argue that all artists are what Picasso has described as 'visual opportunists' (of which he is, in his own estimation of course, the best) and work standing on the shoulders of artists that have gone before them, however the mechanisms that resulted in *The Butcher's Son* seem formulaic and, in some ways, opportunistic.

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[27] Ibid.

[28] Boden, *The Creative Mind*, 1.

Circle back: The Messy Business of the Human Mind…

Stanislas Dehaene, cognitive neuroscientist, Robert Epstein, senior research psychologist at the American Institute for Behavioral Research and Technology in California, and Anthony Chemero, philosopher and psychologist, all seem to agree that science knows very little about mind and consciousness.[29] The notion that the brain is an information processing center that performs some essential data processing functions seems to be a faulty assumption on which popular metaphor and brain research has stalled. Epstein pugnacious assertion: "… mainstream cognitive neuroscience continues to wallow uncritically in the IP (information processing) metaphor."[30] He maintains that influential thinkers have made grand predictions about humanity's future that depend on the validity of that metaphor.[31]

In contrast to allegiance to the IP metaphor, Chemero presents a vision of cognition in which unified animal-environment systems take centre stage, and in which complex couplings, unchaperoned by internal representation (a presentation to the mind in the form of an idea or image), are the stuff of which minds are made.[32] This makes me think of a human mind in free-float mode; nothing is jelled into solid image or idea; everything just hovers and floats with little spears or clouds of this or that - intersecting, merging or fleeing. Consider the idea that cognition

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[29] Stanislas Dehaene, *"Consciousness and the Brain Deciphering How the Brain Codes Our Thoughts"* (New York: Viking, 2014), np.; Robert Epstein, Gary Roberts, and Grace Beber (Eds.), *Parsing the Turing Test: Philosophical and Methodological Issues in the Quest for the Thinking Computer* (Springer: Netherlands, 2008),page vii; and, Anthony Chemero, *Radical Embodied Cognitive Science* (Cambridge: A Bradford Book, The MIT Press, 2009).

[30] Robert Epstein, "The Empty Brain," *Aeon*, June 6, 2018, https://aeon.co/essays/your-brain-does-not-process-information-and-it-is-not-a-computer.

[31] Ibid.

[32] Chemero, *Radical Embodied Cognitive Science*, pages 165-181.

is not only embodied but also extended, in the sense that cognition is something that extends beyond human boundaries and includes aids such as notebooks, computers, or smartphones, that is, technological artifacts which serve information processing as well as cognitive outsourcing and scaffolding.[33] Lyre defines four primary domains of cognitive extension:

(1) The body

(2) The physical environment

(3) The "informational" environment

(4) The social environment[34]

When human action extends through these domains, we may produce both P-creative and H-creative artefacts.

Harari writes, "For the last 70,000 years or so, human experiences have been the most efficient data-processing algorithms in the universe, hence there was reason to sanctify them."[35] What happens now when AI outstrips many human functions? One might ask, which human functions? Which human functions might still hold value in a universe of vastly extended cognition?

Gasparyan writes, "If we refer to the basic definition of "sign" and "meaning" found in structuralism and post-structuralism, we see a fundamental difference between the capabilities of

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[33] Holger Lyre, "Socially Extended Cognition and Shared Intentionality," *Frontiers in Psychology*, May 28, 2018. https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00831/full.

[34] Ibid.

[35] Yuval Noah Harari, *Homo Deus: A Brief History of Tomorrow* (Toronto: Signal, 2016), 781.

a machine and the human brain engaged in the processing of a 'sign.'"[36] If we look at language as an abstract system, which is supported by a group of its users, 'signs' exist only in their connections to other signs in a great big messy web of communally and individually constructed meanings.

For instance, the word 'war' means something different to just about everyone who hears the word even though all of us can agree on a similar definition. To one it means Uncle Pete, to another it conjures an image of a day and a gesture ("We got an orange from a soldier!"), to another, it is horror and waste beyond measure, to yet another – it brings up black and white photographs on newsprint. I suspect that it would be very challenging to write an algorithm for AI that would factor in individual mess, connections, associations, complexities, and chaotic attractors. So, in some individual human sense 'war' has no specific meaning at all, rather more like a kind of empty space into which certain images or concepts, or events of usage, can be spilled into a pool of general sense that many humans will recognize and feel.

As we know so little about the human brain, and even less about mind and consciousness, trying to construct something artificial, which works like the thing we know so little about, seems a fool's errand. Why, as humans, do we persist in trying to make things in our own image, so to speak? At the same time as we seek to create an artificial human brain, we want to place restrictions on it so that it will do the bidding of the real human, and not run amok and do its own independently artificial thing. We have crossed the Rubicon in that artificial intelligence, programmed by algorithms, with the power to generate new unchaperoned

[36] Diana Gasparyan, "Artificial Intelligence and Semantics Through the Prism of Structural, Post-Structural and Transcendental Approaches," *Integrative Psychological & Behavioral Science* 50, no. 4 (2016): 704.

algorithms, can tell me which handbag I would like to buy, and it is often right! Can it make art, for humans, that carries aesthetic meaning?

Veer off onto two essential biographical tangents: Turing and Warhol

AI and Alan M. Turing (1912–1954), and Creativity and Consciousness

Turing grew up in a middle-class home and went to day schools but eventually private boarding schools. He seemed to have few close relationships beyond the one friend, who tragically died of tuberculosis. Turing is described as a quiet, shy, and sometimes awkward man. He was also an openly gay man, comfortable with his orientation, in a country (UK) where homosexuality was still a crime.[37]

Many well-known artists and intellectuals lived with concealed gender identity and sexual orientations. Elaborate subterfuge, however, was not natural to Turing; he was very matter of fact.[38] His friend and student Robin Gandy wrote after his death that "because [Turing's] main interests were in things and ideas rather than people, he was often alone. But he craved for affection and companionship . . . the first stages of friendship [were] not easy for him."[39]

While at Princeton, he wrote to his mother about his Cambridge friend and mathematician Maurice Pryce. "Maurice is much more conscious of what are the right things to

[37] Kelkar, Shreeharsh, and Marc Presler, "Difficult to Decode: Alan Turing's Life and Implications," Harvard University Graduate School of Arts and Sciences, July 3, 2012, http://sitn.hms.harvard.edu/flash/2012/turing-biography/.

[38] Ibid.

[39] Andrew Hodges, *Alan Turing: The Enigma* (London: Vintage, Random House, 2012), 516.

do to help his career. He makes great social efforts with the mathematical big-wigs" – a remark that perhaps hints at what it was like to be Alan Turing.[40]

The Turing Machine

Turing was a mathematician at King's College of Cambridge University, UK. At age 24 these studies culminated in his seminal paper "On Computable Numbers" (1936).[41] This paper is considered a key work in understanding the foundations of mathematics, the method relies on a thought experiment. Turing imagined a machine that runs on instructions printed on a tape. The machine can read both instructions and data from the tape; the machine can also write to the tape. This prototype of a computing machine, the Turing Machine, is used as a mathematical representation of a computer.[42]

The second phase of Turing's work, cryptography, developed while working for the British Secret Service during World War II. Turing, and other mathematicians, were recruited into the code-breaking effort of British government at Bletchley Park to crack the Enigma machine. Turing's contributions helped with the success of the decryption work at Bletchley Park and played a substantial role in the eventual victory of the Allied Forces.[43]

First Steps Toward Artificial Intelligence

At the end of WWII, Turing talked to his co-workers about building a mechanical brain. In computation, one tries to describe the workings of things (nature, the brain, animals,

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[40] Ibid, 130.

[41] Alan Turing, "On Computable Numbers," November 12, 1936, https://www.cs.virginia.edu/~robins/Turing_Paper_1936.pdf.

[42] Kelkar and Presler, "Difficult to Decode."

[43] Ibid.

machines, humans) at "a level of abstraction that is independent of how they are built."[44] For Turing, the working of the brain could be described as a computational system, operating with algorithms and with influxes of data. It did not matter whether the algorithms (or "software") of the system were implemented in a mechanical, electronic, or cellular form (the "hardware") — Turing was thus articulating the hardware/software distinction that is a key idea in computer science today. At a time when programming computers meant physically rewiring them, such a distinction was not at all obvious.

Turing would never talk about, let alone publish, his Enigma work. His ideas about building computing machines were only articulated in unpublished reports at the National Physical Laboratory and Manchester University, where he worked after the war. His most famous publication is his 1950 paper for the philosophical journal, *Mind*, titled "Computing Machinery and Intelligence."[45] In this paper, Turing proposed that the question, "Can machines think?" was ill-defined. Instead, he proposed an alternative formulation: a machine could be said to be "intelligent" if it could fool a human questioner into thinking that it was a human being. This is the famous Turing test, and it has been a lasting contribution in the cultural debate about what it means to be intelligent.

In 1952, Turing was convicted of the crime of homosexuality. He chose the treatment of chemical castration rather than incarceration. About a year after his treatment was completed, he killed himself by eating an apple stained with cyanide in 1954.[46]

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[44] Ibid.

[45] Alan Turing, "Computing Machinery and Intelligence," *Mind* 49 (1950): 433-460. https://www.csee.umbc.edu/courses/471/papers/turing.pdf.

[46] Hodges, *Alan Turing*, 575.

Putting Turing's work on Boden's three-legged stool of, "Creativity is the ability to come up with ideas or artefacts that are new, surprising and valuable," one can only answer yes to all three.[47] Creativity lives within all realms of human endeavor. Milena Ivanova writes persuasively of aesthetic claims in science that have been confirmed in neuropsychology studies; these have demonstrated that the appreciation of mathematical equations corresponds to the same brain activity as aesthetic appreciation of music and visual art, and use similar creative approaches to coming up with new artefacts and ideas.48 Turing is the sum of his DNA and his lived experiences. His consciousness has been constructed from all the big and small events, thoughts, feelings, and encounters. The remarkable creative products of Turing's work arose out of the muddle of experiences that make up a unique life. Alan Turing's life, lived in relative obscurity, could not be farther from that of Andy Warhol.

Andy Warhol (1928 – 1987) and Creativity and Consciousness

Andrew Warhola was born in a working-class area of Pittsburgh to immigrant parents from what is now Slovakia. The family was very poor. Andy was a sickly child and spent many days home from school with what had been diagnosed as St Vitus Dance. His mother, Julia, was an extremely creative and resourceful person; she made artificial flowers that she sold door to door. The family went to a Ukrainian Catholic Church, to which Andy went at least once a day with his mother. Andy loved movie magazines and Julia would try to pick up old ones and bring them home for Andy's collages and drawings. Andy's father died in 1942 leaving Julia to raise

[47] Boden, *The Creative Mind*, 1.

[48] Ivanova, Aesthetic Values in Science. 3

her three sons on her own. Andy's father's dying wish was that Andy would continue his education on to college.[49]

In 1945, Andy was accepted at Carnegie Institute of Technology (presently known as Carnegie-Mellon University), the first of his family to go beyond high school. He made it through with a few scholarships and worked in a local department store making window displays. Upon graduation in 1949, Andy boarded an overnight train to New York City to pursue the world of art.[50] Andy quickly received illustration work from all of the major fashion magazines, including *Glamour*, *Vogue*, and *Harpers Bazaar*. Andy's "blotted line" technique looked new and surprising, coupled with his superb draftsmanship, these made him a valued property![51]

One thing led to another and in the early sixties Andy was looking for worthy subjects to advance a painting career. A friend suggested making paintings of things people like.[52] Andy chose Campbell's Soup as he and his mother, Julia, whom by then Andy had moved to New York, regularly had it for lunch. The exhibition of *Campbell's Soup Cans* opened in Los Angeles and caused a mild sensation, and launched Andy's move into Pop Art.[53]

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[49] "The Andy Warhol Family Album," *The Andy Warhol Family Album*, 2015, http://www.warhola.com/biography.html.

[50] Ibid.

[51] "Andy Warhol — From A to B and back again: Nov 12, 2018-Mar 31, 2019," Whitney Museum of Art, accessed August 4, 2019, https://whitney.org/Exhibitions/AndyWarhol.

[52] "What Was Andy Warhol Thinking?" Tate, accessed May 26, 2020, https://www.tate.org.uk/art/artists/andy-warhol-2121/what-was-andy-warhol-thinking.

[53] "The Warhol Family Album."

Andy understood the commodification of just about everything that had started in the post WWII years. He worked with the multiples and repetition of images, which were now part of everyday life in the consumer world. He also understood the power of celebrity, he embraced new technologies such as photo-silkscreen (many artists would see this as 'cheating') and moved them firmly into his art practice. In 1968, he was shot at the Factory (his studio and continuous party space) by a hanger-on, Valerie Solanis. His complete, often naïve, openness to everything and everyone shifted after this, but his prodigious hard work did not.[54] Andy's iconic images understood a time in history and acted as a mirror for it, and for us as humans.

In every way, Warhol's work meets Boden's measures: his work was constantly new, surprising, and has value as a societal reflection that in many ways far surpasses the money made by sale of the works. Warhol's work arose from the iconostasis of the church he and his mother attended, from every consumer product he ever saw stacked on a shelf, from fuzzy celebrity photos from cheaply printed magazines, and everything else that entered his field of vision as he was an acute observer of images. Because of his DNA, and his upbringing, he was unfettered by many conventions of behavior and created a life for himself and others that was also a new and surprising powder keg of creative activity. We could try to write algorithms for artificial intelligence that mimicked Andy's influences and use these to produce artworks, but we would only be able to do so because Andy Warhol and his consciousness had previously existed.

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[54] Jennifer Latson, "This Is Why a Radical Playwright Shot Andy Warhol," *Time*, June 3, 2015, https://time.com/3901488/andy-warhol-valerie-solanas/.

Step back onto the path: Aesthetic Meaning, Creativity, and Consciousness

Why the bios? Why do these bits of story of these two lives matter? Because these lives were shaped by inner and outer experiences that fed the human consciousnesses, that allowed these two geniuses to do unlikely work in their times and places. Common understandings of creativity are nearly as hard to pin down as Jell-O, however, many thinkers accept Boden's notion of creativity as having three essential parts. So, we return to Boden's three-legged stool which describes the product, but not the process. There are also several popular, and fondly held, myths associated with the creative mind such as:

- You are either born with it or not.
- You have to be right-brained.
- It operates on inspiration! Eureka!!
- You have to be a little quirky.

Sometimes formal education tries to lockdown the doors and windows of creativity, making it harder for humans to hear and value the murmurs and flashes of memory, to see the tiny, colourful fractals and fissures in thoughts, or feel buds of emotion - that may connect into something new and surprising. A half-turned phrase, a glance at an earlobe, the wonder at the undercarriage of a vintage car, could start to assemble into an idea or an artifact that is new, surprising, and possibly even valuable. The unique clusters of human experiences that make up an individual consciousness cannot be replicated because we have no idea how this works in the infinity of unique human experiences and consciousnesses. Boden, however, goes on to write

that as we understand more about the potential of artificial intelligences, humans will encounter new conceptual spaces by using computational concepts *natural* to AI.[55]

Enter a New Path Here: Human, Artificial, Alternative: Can Alternative Intelligence Be Natural?

Adams, Petruccinoe, and Schuld write:

> Artificial intelligence refers, among other things, to machines' capacity to demonstrate some degree of what humans consider "intelligence". This process is being driven by the rapid advancement of machine learning: getting machines to think for themselves rather than pre-programming them with an absolute concept.[56]

Another nagging question is do we as humans even know how we think for ourselves? To return to what is aesthetic meaning, what is creative artifact, and ultimately what is creativity (at least, this is where I began), I wondered is there something that human brains, minds, bodies, or souls do that is distinctly different from artificial intelligence, something that holds creative identity and aesthetic meaning within the realm of the human maker(s)? I think this might matter to our human species at this time in history. I wonder about specie-ist biases that will not comfortably last out this century. Advances in medical science, in addition to cognitive and neuroscience will move humans, bit by bit, toward hybridity in order to help address physical and mental challenges in our human species. A soon as we can do this well (in areas of medical science this is happening), humans will want to move to artificial 'improvements' that are *not*

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[55] Margaret A. Boden, "Response, Modelling creativity: Reply to reviewers," *Artificial Intelligence* 79, no. 1 (1995).

[56] Betony Adams, Francesco Pertruccinoe, and Maria Schuld, "What is Quantum Machine Learning and How Can it Help Us?" *The Conversation*, April 18, 2019, http://theconversation.com/explainer-what-is-quantum-machine-learning-and-how-can-it-help-us-114627.

necessary to fix something that is not broken, but simply to play with making us smarter, faster, and live longer. We will ask questions such as, when is a human is still a human? Do we care? What percentage of 'real human parts' will determine if one has 'human' stated on a passport? Will robots that are completely AI be their own intelligent species and have protected species rights?

Many scientists and artists are now looking at AI as 'alternative,' rather than 'artificial,' intelligence. As repeatedly stated, artificial is commonly defined as, "made or produced by human beings rather than occurring naturally, especially as a copy of something natural."[57] New intelligences seem not to be copies of something natural, i.e. human beings, but perhaps, are becoming natural to themselves as the applications continue to increase their own learning in their own ways. In many ways, *Alternative Intelligence* exists.

While not acting as orderly information processing systems, human beings seem to operate as big-messy-individual-and-collective-selective-idiosyncratic-subjective-faulty-memory-buckets, invaded by emotional-spiritual-physical and cognitive mayhem. It is in this seeming chaos, that human creativity is possible. This is not how what we refer to as artificial intelligence works. Will 'alternative intelligence' eventually evolve as an independent species and have rights in law, a place in the social order, and their own form of creativity, their own type of consciousness? Can this happen without a human brain controlling the experience and growth? If humans are building the artifact, that will operate as an intelligent creative entity, how can we begin to do this when we do not even understand the scope or methods of our own intelligence or creativity? 'Alternative Intelligences' are beginning to build themselves. The

[57] *Lexico*, "artificial."

being that is *other* has been repeatedly proposed in science fiction, so we humans already *have* imagined it.

Consciousness of Machines?

It is unlikely that humans (who really do not deeply understand their own consciousness) will be able to understand the consciousness of machines and conversely, machines will likely not understand the consciousness of humans. The term 'artificial intelligence' seems to imply that the intention of developing artificial intelligence is to mimic something that works similarly to human intelligence. In this, we will fail; we will have nothing more than another Nancy. A fox cannot think like a rabbit, nor a human like a snake.

To return to Boden's definition, "Creativity is the ability to come up with ideas or artefacts that are new, surprising, and valuable."[58] Will there be many different standards of 'new' and 'valuable' depending on whom (meaning what species) has made it? Will we care about creative ideas and artifacts that are not created by the species to which we belong? Will we have any understanding of new, surprising, or valuable, if there is little contextual relationship between beings and their products? Will we ascribe greater value to other species in nature as we begin to regard them as creative entities? Will morphogenesis, which Turing had only begun to pursue, turn everything we think we know on its head?

My rough checklist for aesthetic meaning is as follows:

The idea or artefact:

1. Can only speak through the tools of the time in which it was made but continues to speak over time.

[58] Boden, *The Creative Mind*, 1.

2. Always reveals, and sometimes advances, the technologies of the time.
3. Although it builds on its past, it springs surprises and challenges.
4. Inveigles viewer, or participant, involvement by unknown means.
5. Carries with it, and often anticipates, interests of its time and future time.
6. Has some kind of visual, emotional, spiritual, or cognitive lure.
7. Provides a mirror for our entry.

Maybe *Alternative Intelligences* could… but not quite yet.

Relax and Enjoy: A Spot of Speculative Fiction

The Power of Genius Collaboration…

or What Could Be Happening Right Now in an Alternative/Parallel Universe!

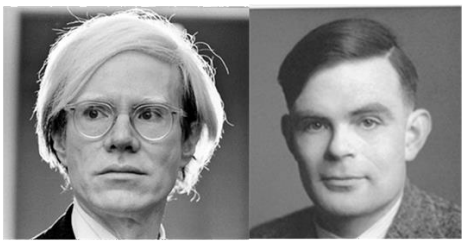
I frequently run little fictions. Here is one. Alan Turing does not die (either by his own intention or not) in 1954, at 41 years of age. He is right in the beginning stages of investigating morphogenesis; I believe he is too curious about it to choose death even though he is being physically tortured by chemical castration. He sees Any Warhol's work in the later 1950's and 1960s. Turing recognizes a kindred spirit in Andy's fascination with new technologies and the possible art applications of morphogenesis. Andy is particularly delighted when Alan talks about nonlinear dynamic systems, which describe what may appear chaotic, unpredictable, or counterintuitive, contrasting with much simpler linear systems. Turing and Andy talk about morphogenesis as a process by which order is created *in* the developing organism. Andy recognizes this as essentially a mirror of the human creative process in art making. Everything starts as a kernel born of experiences and human consciousness and starts to work its way along, colliding with who-knows-what along the way. They both recognize each other as men living

openly gay. They recognize they are both on the Autism Spectrum. Andy does not die in 1987, at the age of 58, from a heart attack after gallbladder surgery.

By this time, Andy has learned enough from Turing that he is firmly nestled in the world of *Alternative Intelligence* and art. Turing is failing and has a little dementia, but it doesn't matter as this *Alternative Intelligence* is working, on its own now. It lives on a chip that has been implanted into Turing's brain; it kind of circumnavigates the dull bits.

Warhol and Turing are completely open to using human intelligence, consciousness and imagination in any way that is alive; they are also completely open to observing, not manipulating, *Alternative Intelligences* as they grow and evolve. Alan has agreed, however, to be in an initial trial of the new chip that an *Alternative Intelligence* has developed for living with dementia. He does not want his old brain back; he is hoping for a newly interesting one. Andy is delighted. Everyone loves a happy ending so – Andy and Alan joyfully continue their work, hand in glove with *Alternative Intelligences* to create ideas and artifacts that are new, surprising and of value. AI, Andy, and Alan are Boden's three-legged stool.

Andy and Alan and AI will together create works of aesthetic meaning to both the vestiges of human intelligence, Alternative Intelligences, and what has yet to evolve in every manner of hybridity. Both Alan and Andy agree with Einstein, who famously stated, "Logic will you from A to B: imagination will get you everywhere."



Andy Warhol. 1973. Jack Mitchell/*Getty Images*. Alan Turing. 1951. *NY Times*. June 5, 2019.

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Complexity, Chaos, Collaboration: Untangling Strands of Truth;

Teaching/Learning/Teaching in the 21st Century

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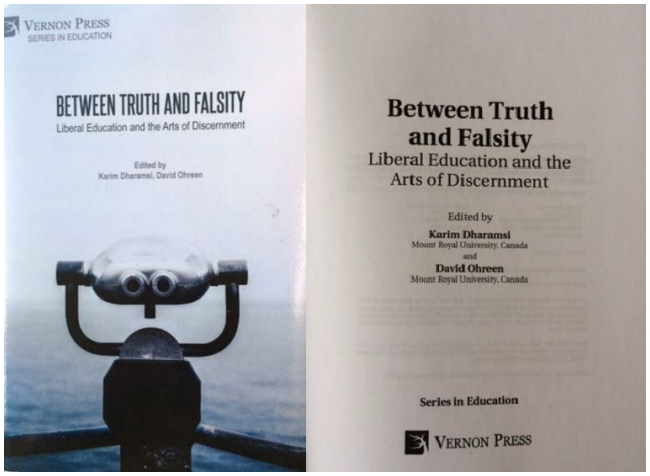

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Review

The contributors to "Between Truth and Falsity" model liberal education by taking a common important world issue and deconstructing, deliberating, and dissecting it through a variety of perspectives across the arts, sciences, and humanities. The reader is left with more questions to pursue and lived realities to examine, laying the foundation for the continued pursuit of the Truth. This book should be required reading for anyone teaching, supporting, or leading liberal and general education programs to serve as a reminder of what's at stake for our students and an informed democracy.

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COMPLEXITY, CHAOS, COLLABORATION: UNTANGLING STRANDS OF TRUTH; TEACHING/LEARNING/TEACHING IN THE 21ST CENTURY

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PhD by Published Works

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Introduction

> The edge of chaos is the balance point where the components of a system never quite lock into place, and yet never quite dissolve into turbulence, either… The edge of chaos is the constantly shifting battle zone between stagnation and anarchy, the one place where a complex system can be spontaneous, adaptive and alive.[59]

Spontaneous, *adaptive*, and *alive* are words that describe the interconnected strands of meaning, interpretation, and understanding which shape various interrelationships in teaching and learning a dynamical, creative system of collaboration that can move toward important, if messy, truths. The 'problem' of truth is a tangled web; linear processes that rely on mechanistic proving or disproving, sometimes miss essential elements that allow for untangling a dense web of notions. The liberal arts can draw from chaos and complexity theories and use these in the collaborative context of the post-secondary classroom to move into uncharted, unanticipated and emergent learning, the importance of which can sometimes be ignored. To examine this tangled web, complexity theory, which derives from chaos theory, seems a reasonable fit. Initially developed in the field of physics to supply insights into how "complicated, dynamical systems rapidly cease to be predictable even if their initial states are known in detail," various educators have been attracted to complexity theory as a means to illuminate the many uncertainties and simultaneities that do not fit comfortably into more conventional theories of learning.[60] Mason emphasizes the importance of complexity theory on interpretive perspectives that are "trans-

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[59] M Mitchell Waldrop, *Complexity : The Emerging Science at the Edge of Order and Chaos* (Toronto ; Simon and Schuster, 1992), 12.

[60] Philip Ball, *Critical Mass : How One Thing Leads to Another* , 1st Americ (New York: Farrar, Straus and Giroux, 2004), 5.

phenomenal, transdisciplinary, trans-discursive, that invite and tolerate ambiguity."[61] Emergent phenomena derived from relationships may be valued differently when viewed from the perspective of complexity.

The following discussion begins to explore relationships from the perspective of complexity and within the context of creative, cognitive, affective, and physical learning. I draw from my experiences as an instructor of critical theory, as it applies to contemporary art, to discuss complex, active learning as a process of collaborative inquiry. Sullivan states that it is a "useful assumption to consider complexity of contemporary art in a similar way to the stance taken by qualitative researchers who seek to understand multi-faceted realities such as life in communities or classrooms."[62] The parallels and intertwinings of critical theory and how it is reflected in collaborative human relationships will be the focus of the stories from experience.

Relationships and Complexity

[61] Mark Mason, "Complexity Theory and the Philosophy of Education," Educational Philosophy and Theory 40, no. 1 (2008): 4, https://doi.org/10.1111/j.1469-5812.2007.00412.x.

[62] Graeme Sullivan, "Critical Interpretive Inquiry: A Qualitative Study of Five Contemporary Artists' Ways of Seeing," Studies in Art Education 37, no. 4 (1996): 10, https://doi.org/10.1080/00393541.1996.11650456.

A complex system has three interrelated hallmarks: "Growth, mutual influence and nonlinear connectedness."[63] For example, one could think about a messy ball of yarn composed of many different types, lengths, colours, weights, and textures, as similar to the types of relationships belonging to each of thirty adults and one instructor which make-up many post-secondary classes. Each adult has at least five different kinds of relationships (with oneself, with others in the class, with the course material, with one's instructor, with the universe). If these factors are multiplied by the number of persons in the class, the result is one hundred and fifty-five (155). The product of the multiplication of these interactions with each other is twenty-four thousand and twenty-five (24,025). Each group of thirty-one students comprises a different set of thousands of relationships; therefore, as a whole, each group will operate as a distinct 'organism.' Complex systems grow organically; "they are not assembled piece-by-piece and cannot be viewed as such."[64] Just as wetness is an index of water, unpredictability is a mark of a complex system of relationships. Growth in a complex system is "the result of a series of highly contingent events that would not happen again if we could rewind the tape."[65] As a result, when viewed through the lens of complexity, the relationships in a class (a community of learners) will experience growth, will change in ways that cannot be predicted or replicated, and progression will be non-linear in nature. These characteristics are neutral (neither positive nor negative). The role of the instructor is to be highly vigilant and intuitive in facilitating toward meaningful learning within the context of a dense web of relationships. Bennett and Rollheiser discuss,

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[63] Bernard Ricca, "Beyond Teaching Methods: A Complexity Approach," Complicity: An International Journal of Complexity in Education 9, no. 2 (2012): 10, https://doi.org/10.29173/cmplct17985.

[64] Ricca, 31.

[65] Brian Rosenberg, "Gould Promotes the Entity Theory of Evolution," The Tech, December 7, 1990, http://tech.mit.edu/V110/PDF/V110-N56.pdf.%0A%0A.

"knowing the learner through multiple lenses."[66] These multiple lenses could be extended to 'inter-viewing' amongst all the relationships, including the relationships that are constructed with the content of the course. "In every case, moreover, the very richness of these interactions allows the system as a whole to undergo spontaneous self-organization."[67] A self-organizing system is one that "spontaneously generates order that is complex and adaptive."[68]

In the post secondary context, the relationships between teaching, learning, and content, for both instructors and students, seem to move into authentic learning when complexity is embraced. There is discomfort and risk on the parts of instructors and students; nothing is clear; ambiguities rage; if there is willingness to struggle through the storm, the sky often clears and there rises up a new order that is complex and adaptive. A leap of faith, on everyone's part, is required to get there. To meaningfully construct concepts and relationships, in contexts that involve real-world problems, and projects that are relevant to the learner, it is not an easy business. Making room for sustained lateral thinking about divergent notions requires both trust and practice.

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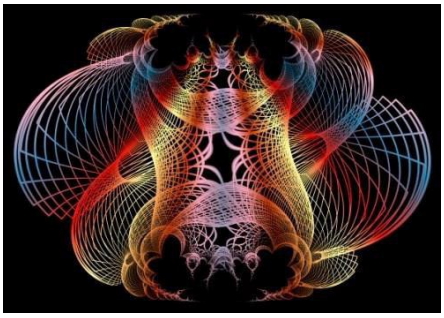
[66] Barrie Brent Bennett and Carol Rolheiser, *Beyond Monet: The Artful Science of Instructural Integration* (Toronto: Bookation, 2001), 26.

[67] Waldrop, *Complexity : The Emerging Science at the Edge of Order and Chaos* , 11.

[68] Glenda Holladay Eoyang, "Conditions for Self-Organizing in Human Systems" (THe Union Institute and University, 2001), https://capitalrevolution.typepad.com/a_free_enterprise/files/conditions_for_selforganizing_in_human_systems.pdf.

Chaos, Complexity and Creative Learning



Mason discusses the Western tendency to think in terms of discontinuities around such matters as theory and practice, knowers and knowledge, self and other, mind and body, art and science.[69] These dyads are often presented as necessarily distinct and opposed, or on a linear continuum. Complexity challenges these modes of interpretation and, in the process, offers useful insights into education by viewing the dyads as simultaneities. Creativity, at the apex of Bloom's Revised Taxonomy, demands that one must embrace simultaneities.[70] Creativity cannot be understood or developed without associating phenomena, blending disciplinary perspectives, and, risking the use of authentic voice. Doll posits that the aim of complexity is a process of, "cross-fertilization, pollination, crystallization of ideas."[71] Trygestad considers chaos theory as revealing conditions in learning that are constructive, dynamic, and holistic, that enhance learning by reinforcing systemic approaches to human interactions. These, in turn, encourage cultural diversity as beneficial, and reaffirm theoretical notions of intelligence as

[69] Mason, "Complexity Theory and the Philosophy of Education," 5.

[70] David R Krathwohl, "A Revision of Bloom's Taxonomy: An Overview," *Theory Into Practice* 41, no. 4 (2002): 212–18, https://doi.org/10.1207/s15430421tip4104_2.

[71] William E Doll Jr, "Complexity and the Culture of Curriculum," *Complicity: An International Journal of Complexity and Education* 9, no. 1 (2012), https://doi.org/10.29173/cmplct16530.

multidimensional and "without linear progression."[72] As Mason states, "Complexity therefore suggests a shift from our preoccupation with causes to a focus on effects."[73]

Effects of Stamping the Doc-thing or 'Feelings in the Air'

My interest in complexity theory and collaborative inquiry in action has grown out of the needs and patterns I have observed in a course on critical theory, which I taught for several years. In this course, most of the students are in the second or third years of a program leading to a Bachelor of Applied Arts in Visual Communications. I would have had these students for a course in each of the three previous terms before I see them in critical theory class, so we all know each other well. There are usually thirty to thirty-five students in the class. There are opportunities for both individual and group inquiry in each three-hour class, with time for reflection at the end. Students are required to come to every class with the required readings completed and their understandings and questions documented in; what we have come to call, the '*documentation thing*.' The '*documentation thing*,' or '*doc-thing*,' for short, can take any form that makes sense to the student. For some it is a binder with notes; for others it is sketchbook with colour-coded maps; for others it is a cut and paste system of images that acts as a symbols system for concepts. For one student the *doc-thing* grew into a graphic novel, with a

[72] JoAnn Trygestad, "Chaos in the Classroom: An Application of Chaos Theory," in *Annual Meeting of the American Educational Research Association* (Chicago, Ill, 1997), https://files.eric.ed.gov/fulltext/ED413289.pdf.

[73] Mason, "Complexity Theory and the Philosophy of Education," 12.

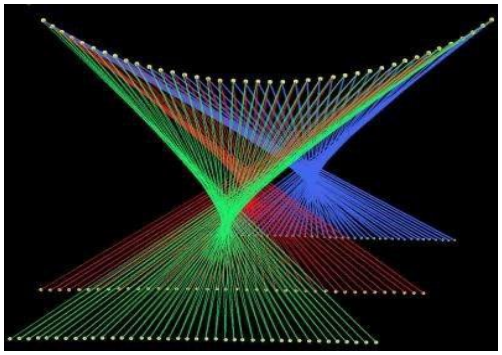
character named Spando who interacted with his coffee cup by discussing and wrestling with "really hard things" (this one was hilarious and probably publishable). Another student used a small suitcase of objects that each represented a theory; main theorists were duct-taped onto the main object. She performed tape reconfigurations with great facility. All that is required of the *doc-thing* is that it be a reasonable method for advancing and demonstrating an individual student's engagement with the content of the course.

Because the doc-thing invites messy, lateral thinking, and opens channels to divergence, more complex relationships start to reveal themselves in ways that do not seem as available when using more linear, conventional methods for exploration. Connections amongst various kinds of content start to emerge that could not easily be accessed in less loose, individualized, and quirky methods. Life is messy, human constructs are messy, and by using methods that invite stages of 'messiness,' the mind can become freer of constraints, biases, and prejudices that stand in the way of access to truth.

At the beginning of every class, everyone puts her/his doc-thing out on the table. I come around with a date stamp (like an old-fashioned library stamp) and I stamp the relevant area of each doc-thing with the date. We chat as I go around; students get excited about something they have found or express confusion and frustration with the articles they are required to read. Students mill around looking at each other's doc-things and get ideas for their own. For some reason, everyone is always excited about the stamp. Maybe it is about the opportunity for a chat, the tangible, physical engagement with their work, or maybe the stamp itself looks 'official,' but stamping, with its cluster of undefined signifiers, has become a tangible relationship builder. This phase also acts as a greeting time during which I get an opportunity to 'read' the emotional tone of the room ("I am so tired," "I didn't get any of this," "Too many words to read – do we get

to watch a movie today?"). If the engine of worry is whirring ("I don't know where I'm going to scrounge up rent this month," "My student loan is maxed out and it's only October," "I am so worried about court on Tuesday – I am so afraid of losing my kids.") the day will require considerable reassuring humour and camaraderie. This brief phase is revelatory of students' relationships with themselves as inner and outer voices are revealed in the doc-thing; of peer relationships as they are strengthened by the curiosity shown in each other's work; of student/instructor relationships as these are strengthened by a few words with each one; of each student's inchoate relationship with the course content. Each student's relationship to learning starts to emerge when depth and means of engagement become visible to the student, to other students, and to the instructor. The doc-thing grows and morphs over time. Students become emboldened to risk to give their doc-thing a stronger individual and externally communicative voice in relationship. Areas of interest emerge out of this process; if a certain concept or particular theorist starts to leap out in several doc-things or if a particular quality of question is emerging, an idea starts to bubble to the surface about focus for that day's class. It is never the same or predictable. I have a skeleton of concepts to be explored that day, a bag of useful tricks and some idea of how/when they could be used, a selection of readings and videos, and then there is *Ba*.

Ba



Ba is that "constantly shifting place, that edge of chaos, spontaneous, adaptive and alive."[74] Bennett and Rollheiser write about complexity theory and education in terms of, "the idea that when certain forces come together, patterns will emerge. Patterns emerge in the moment; the teacher must respond to that moment."[75] *Ba* has become a useful code to describe the time/space when we will focus, reflect, and share findings and experiences. I have never discussed *Ba* with students. I hand out cards to groups of students with Shimizu's definition the first time we prepare to enter *Ba*. After that, *Ba* exists as part of our shared vocabulary. Everyone knows where we are going. Shimizu defines *Ba* as:

> A context in which knowledge is shared, created, and utilized in recognition of the fact that knowledge needs a context in order to exist. The most important part of *Ba* is interaction. The power to create knowledge is embedded, not just within an individual, but also within the interactions with other individuals or with the environment. *Ba* is a space where interactions take place.[76]

Yorks discusses *Ba* as a "generative space that intentionally changes relationships in the way it renders repetitive cycles of action and reflection, supported by data and experience."[77] When *Ba* is called for, students inevitably call out things like, "Baa-baa black sheep, Ba humbug, ba-ba-da ding!" The room lightens and the focus moves from individual life to the collaborative work of the day. Patterns in relationships shift to new configurations where strengths of individuals in a

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[74] Waldrop, Complexity : The Emerging Science at the Edge of Order and Chaos , 14.

[75] Bennett and Rolheiser, Beyond Monet: The Artful Science of Instructural Integration.

[76] Hiroshi Shimizu, "Ba-Principle: New Logic for the Real-Time Emergence of Information," Holonics 1 (1995): 67–69.

[77] Lyle Yorks, "Adult Learning and the Generation of New Knowledge and Meaning: Creating Liberating Spaces for Fostering Adult Learning Through Practitioner-Based Collaborative Action Inquiry," Teachers College Record 107, no. 6 (2005): 1221, https://doi.org/10.1111/j.1467-9620.2005.00511.x.

group are recognized and used to explore course content as a collective. *Ba* is the fancy handshake, the secret shared code. By integrating *Ba* as apart of the routine of every class, by opening non-judgemental spaces for interacting thoughts, students and instructors can risk constructing perhaps, unlikely webs, which in the working, start to reveal obvious but unexposed truths. Like the 'murder boards,' so popular in detective television, truths reveal themselves as the webbed, disconnected information on the board, starts to emerge in new coherence.

Drops in the Pond or Complexity in Action

I see my role as an instructor as one who drops pebbles into the pond. As a pebble drops into a pond, fish respond as a self-organizing system. Sometimes they move in one direction as a group; sometimes they disperse into several groups; sometimes the dispersal is seemingly random, however, the five aspects of complex relationship all reconfigure in response to the nature of the dropped pebble. Mason (2008) writes:

> Over time … a network of connections and interconnections becomes more and more webbed. Learning now occurs, not through direct transmission from expert to novice …but in a non-linear manner through all in a class exploring a problem together … In other words, the curriculum is now an emerging one within an ongoing process that actually catalyzes itself via interactions within the system.[78]

[78] Mason, "Complexity Theory and the Philosophy of Education," 14.

In this description, Mason raises an additional factor that is key to working in complex, learning relationships: time.[79] "Without *having* the time and *taking* the time, exploration will be superficial at best and confusing at the very least."[80] Kelly notes time constraints as a major factoring in limiting creative development, which is essential for learning in complexity.[81] The learning processes are heuristic for both instructor and students.

The instructor can act to stimulate interest (drop a pebble) as a means to further investigation. The stimulation could be to ask the question that leads to the formulation of questions so that the students can then proceed to develop means, as individuals and in groups, to move through trials and errors as they work toward understandings. Because critical theory studies involve theories and theorists who have established various lenses with which to look at issues of power, race, class, ethnicities, religion, and gender, there is seldom a clear path from A to B. The study also provokes controversy in all aspects of relationship. Unless time is taken to foster and nurture all of these relationships in a safe and caring environment, controversy can engage emotions in ways that are counter-productive to learning.

MacKeracher states that her students have convinced her, "very little happens without relationships of some sort."[82] My students continuously persuade me that relationships are at the core of learning; if I forget this for I moment, I am invited to listen to their snores. At least a few of the five aspects of relationship (self, peers, instructors, course content, learning itself) must be

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[79] Mason, 15.

[80] Mason, 15.

[81] Robert W Kelly, *Educating for Creativity: A Global Conversation* (Calgary: Brush Education, 2012).

[82] Dorothy. MacKeracher, *Making Sense of Adult Learning* , 2nd ed. (Toronto: University of Toronto Press, 2004), 151.

engaged at any given moment or the dissipation of energy in a class is palpable. Collaborative development, as the bedrock of creative development, is essential.[83]

A typical day can unfold as follows: stamping the doc-thing; entering Ba; deciding on the big questions of the day; moving into groups to explore the big questions, usually as big maps; snooping the explorations of other groups; excavating patterns that are trying to emerge; looking for ways to demonstrate the patterns that have been posited in the work of the group; watching a video about a contemporary artist and her work; returning to groups to locate the artist and her work in the mix; going on another snoop mission; excavating more patterns; locating these patterns in the work of each group. Students are frequently photographing their work-in-progress and posting the photos on our class's electronic Blackboard.

We usually end with a pause for quiet reflection, then work on a question such as, "So what did we do today?" or "What were you doing when you were really learning?" Strategies for both individual and group reflection could include use of De Bono's Six Thinking Hats, Plus/Minus/Interesting, and Random Input, as well as a number of strategies that we have developed for ourselves including *Odd Human Out* and *Elephant in the Room*, for example; the titles of these are somewhat self-explanatory.[84] Although De Bono and his tools can be criticized as dated, I have not found other strategies that request reflection on the cognitive, affective, and creative domains of learning in as succinct and immediately useful a form.

When we are working as a large group, there is often a four-stage cycle in whatever we do: quiet, individual reflection; sharing reflections; finding patterns (commonalities,

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[83] Kelly, *Educating for Creativity: A Global Conversation*, 16.

[84] Edward De Bono, *Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas*, ed. Summaries.Com (Hamilton, N.Z.: Summaries.Com, 2010).

discontinuities); building models and metaphors as a group; then back to reflection again. We use speaking, reading, writing, drawing, model-making, mapping, metaphor constructing, singing (there was a Russian opera singer in a recent class who would erupt into a passage of opera that connected to whatever we were doing), and threats of interpretive dance. As a result, most intelligences have a voice. Because responding to the work of others is often conducted as a sticky-note conversation with notes placed on a group's work during a walkabout, introverts contribute as frequently as extroverts. As one particularly shy student wrote in her doc-thing about the sticky note process, "Finally, I have a voice!" Sticky-notes have become an essential tool to promote flexible thinking as we reposition and re-configure visual indicators. The instructor's work is to keep moving through the room, looking for shifts in the emotional terrain, in cognitive energy or ennui, in creative approaches, and in patterns of anything that may be emerging.

Sometimes in post-secondary learning situations, there can be an assumption that we are heads on sticks and our bodies are conveyances for these. Over the years, my students have revealed to me the need for physicality in learning. Physical metaphors such as actually using the body as a site for organizing information/ideas/questions has spontaneously emerged several times in recent years. Students also, for instance, have moved out into the hallway to map ideas using their bodies, as locations to map an idea or theory. I am expecting greater growth in this domain of learning. Because we work in an open, non-linear process of learning, students know that there are no confines to how we can explore together. In my pedagogy of chaos and complexity in the post-secondary classroom, I have seen students arrive at so many new (sometimes to themselves, sometimes more broadly) understandings of big truths; they have then

been able to represent these in forms that are brilliantly communicative, as will be explored in the student stories.

Collaborative Inquiry or Folding in the Egg Whites

It is not a comfortable metaphor to think of egg whites folded into the string art of relationships, but both sugar and egg whites can be used to give body to a thread structure. In most culinary mixtures, egg whites have to be folded in with care or they lose their frothy, leavening properties and fall in despair. Such is how collaborative inquiry can operate in a complex system: It can give it body, leaven it, and prevent it from falling into the despair of acting without purpose. Yorks outlines four dimensions of collaborative inquiry as follows:

1. Involving co-inquiry among a collection of inquirers.
2. Having the goal of producing new knowledge.
3. Taking action in the "world" as an important vehicle for learning.
4. Being intentionally educative, useful and developmental for participants.[85]

The study of critical theory relates to reality above what is immediately apparent to our senses (trans-phenomenal), it leaks into a variety of disciplines (social sciences, education, politics, art, literature, science, history, math; ergo is trans-disciplinary), it delves into multiple frames of discourse (trans-discursive), it invites and welcomes ambiguity, and eschews single

[85] Yorks, "Adult Learning and the Generation of New Knowledge and Meaning: Creating Liberating Spaces for Fostering Adult Learning Through Practitioner-Based Collaborative Action Inquiry," 1219.

ways of knowing.[86] When using critical theories as a set of lenses with which to engage in exploring works of contemporary art, discourse broadens even more widely. Exploration could become an exercise in breathing rare air in a small, and alienating, community of seekers without an opportunity to engage with others outside the knowing cohort. Hence, the Critical Theory Fair is born to, "take action in the world and be intentionally educative."[87]

The Critical Theory Fair or Ribbons Flutter in the Air

As I have created section titles somewhat intuitively, air, as a significant metaphor, has only revealed itself to me in editing. Air, for me, is a metaphor for the space for all to breathe together; it is a notion based in abundance rather than scarcity. There is enough air for everyone in the space we have created to now draw in the larger world to the active learning work of our class. The whole notion of a 'fair' as associated with the subject of critical theory is a little tongue-in-cheek; one could be perceived to be festive, the other dry and tedious. There is something about the perceived dissonance that opens opportunity for 'play.' Our advertising for the event is often somewhere between playful and cheeky. The Critical Theory Fair grew out of our need to take action in the world as an important vehicle for learning; it is "intentionally educative, useful and developmental for participants."[88] The best way to describe how the

[86] Yorks, 1219.

[87] Yorks, 1218.

[88] Yorks, 1218.

Critical Theory Fair functions is to tell some stories. I have changed the names of the students to protect the privacy of the individuals.

Find the 'Post'

'Nancy' is a person of First Nations origin, who is in her thirties. She is a single mother of three little girls. She returned to school so she could learn to do something that would make a better life for her children. She was studying to become a graphic designer. At the beginning of the Critical Theory course, she was just dipping her toe into 'discovering' her First Nations heritage because, although she grew up on a First Nations reserve, in a First Nations family, her education had been in off-reserve schools. At the time, it just seemed like a better idea to keep your head down and not talk about, or think about, heritage. By her own admission, she came out of high school looking down on her people and wanting to get as far away as possible from her heritage.

It was not until she was in her early thirties that she started to become more interested in her heritage, largely because she wanted her girls to know more about their heritage. Over the course of the term, Nancy was becoming bolder about self-identifying as First Nations and bolder about entering into discourse on the subject. We were exploring post-colonial theory and 'Nancy' said, "Honestly, in my experience, I can't find much 'post' in post-colonial. The colonizers haven't left yet." We talked clusters of meanings for 'post.' In Nancy's learning about her people's heritage in readings, discussions, and films that were explored in and out of class, many of the mysteries underlying why she grew up, how she grew up started to reveal themselves to her.

As a group of people learning together, we are looking out for each other for frames to shape individual projects for the Critical Theory Fair. Another student said to her, "I think you

just found the seed for your project." Nancy did not say anything at the time, but she came to the second story meeting with her project exquisitely mapped (we have two story meetings per term during which the instructor meets with groups of approximately five students at a time, to discuss their final projects). Nancy had drawings, a site map of the College, and had written a very solid draft of her synthesis page.

Installed on the day of the Critical Theory Fair, the project was made from five sticks (trimmed tree branches), each about six feet tall. Attached to the top of the sticks were a number of leather thongs reaching down about three feet, each of which had a hook on the end of it. Attached to one of the hooks was an official-looking information card. She situated each of the posts at a different location in the College. At her table in the major traffic area, in which the Critical Theory Fair was located, she had a sign that said, "Find three posts and you will receive free bannock on a stick; just think of it as a corndog without the corn or the dog." Nancy sat there with a plate of bannock on sticks and a really good sense of humour, which she was just beginning to reveal.

The sticks referenced the poles used in the Sundance Ceremony, an Indigenous ceremony that had been banned in Canadian law in the late 19th century. It had to be performed in secret, if at all, until 1951 when it was re-legalized. In the Sundance Ceremony, young men would insert hooks into their chests and literally hang from these, on the thongs attached to the top of the poles. A spiritual practice of great power, it was performed as a right-of-passage for young men. It has now broadened, according to Jennifer Ashawasegai Windspeaker "It's the ceremony of ceremonies, because it involves a sacrifice of self to give something to the Creator."[89]

[89] Jennifer Ashawasegai Windspeaker, "Sundance Is the Ceremony of Ceremonies," *Buffalo Spirit* 30, no. 6 (2012), https://ammsa.com/publications/buffalo-spirit/sundance-ceremony-ceremonies-0.

The official looking cards on the hooks had information taken from Statistics Canada and Government of Alberta documents about First Nations peoples and education. For instance, the 'post' at the College Registration desk had statistics about the numbers of First Nations peoples that go on to postsecondary education. The 'post' at the College library had statistics about the rates of illiteracy amongst First Nations peoples. The installation was a very clever and moving blend of banned practices of an oppressed people and statistical information provided by the offices of the oppressor. It was interactive and intriguing. Passersby took Nancy up on the challenge, found three 'posts' and collected their bannock on a stick. She shared with me afterwards that she felt bold, brave, empowered, and smart! She said these feelings were unfamiliar to her, but she really liked them.

Who's Your Jesus?

'Billie' is a Texan man of African American descent. He is in his early forties and is a single father of three girls. A long story landed him in Alberta and back at school. He had always worked in construction but knew he had highly visual sensibilities and wanted to become a designer. He also said his knees were too bad to last much longer in construction.

'Billie' was struggling with the critical theory readings and was very uncomfortable writing but came up with a very sound semiotic system for building his doc-thing. He was at first apologetic about his doc-thing, but as he found students crowding around him and saying things like, "Oh, now I get it!" he became more confident about developing and sharing his system. He came to the first story meeting without direction for his final project for the Critical Theory Fair. One of the other students reminded him of a topic he had brought up several times in previous art history courses. "Remember how you asked, hey, when did Jesus get blue eyes?" Billie had noticed that images of Jesus in works of art from about 500 CE to 1800 CE had shifted from a

middle eastern looking man with very dark eyes to a light-brown haired, blue eyed, fair-skinned man. During the story meeting the group tossed around ideas of how Billie could make this into an interactive piece of action research for the Critical Theory Fair.

Billie's final piece was a large poster mounted on foam-core, with images of Jesus from the history of art. The title at the top was *Who's Your Jesus*? 'Billie,' who is a great talker and a very friendly, engaging fellow, was able to draw in passersby to engage in this work. He asked them to look at the reproductions and put a red sticky dot on the Jesus image that most closely resembled their image of Jesus.

He drew in:

1. middle eastern students,
2. Asian students,
3. local Alberta and Saskatchewan students,
4. instructors
5. college employees – custodians, cafeteria workers

He drew a crowd. The greatest number of dots was accumulated on the fair-haired, blue-eyed Jesus reminiscent of Sunday school book illustrations that are thought to be based on an Albrecht Durer self-portrait from early 1500 CE.

Billie's synthesis page concentrated on cultural hegemony and semiotics, with a little deconstructionism thrown in for good measure. In the next class, when we were debriefing and reflecting on the Critical Theory Fair, Billie shared with the class how much fun he had at the Fair and how "Critical theory is a blast!"

Glamour Anyone?

'Sasha' is a young woman, tall and beautiful, in her mid-twenties. She worked as a window dresser for a few years but was returning to school to get some credentials that could lead her to work as a designer. She became very interested in feminisms and wanted to do a project that linked feminisms, fashion and popular culture. It is interesting that at the beginnings of our explorations into feminisms, very few students self-identified as feminist. This state changed by the end of the course with most students, both male and female, identifying as such. 'Sasha' had collected a trunk-load of research in her doc-thing but was struggling with a clear direction for her Critical Theory Fair project. She had a number of ideas, but they were all verging on the polemic. Her fellow students pointed this out to her at the story meeting and suggested that she might want to keep it in the realm of discourse. 'Sasha' said something like, "I keep looking at my stack of Glamour magazines and waiting for inspiration." That started the ball rolling.

Sasha looked up Glamour magazine covers, for every month of the year, from the year 1962 (the year of Glamour's birth) and up to those from 2012. Fifty years of Glamour! From each cover, she documented all the words appearing on it. She then fed these into Wordle software. She made a bound magazine, in the dimensions of Glamour magazine, which contained a page with a reproduction of each cover for each month of the two chosen years (1962, 2012), a list of words that appeared on each cover, and several Wordle configurations of the words on each cover. She then made a large Wordle for each entire year using all the words and their number of occurrences. These two masters Wordles were framed and put out for public reaction at the Critical Theory Fair with the question. "Which Wordle is 2012 and which 1962?" Passersby used sticky notes to weigh in with their choices. Interestingly, most people selected the reverse of

the actual, i.e. they labelled 1962 as 2012 and 2012 and 1962. Some key words that appeared on the 2012 Glamour covers were *sex, guys, surgery*, and references to celebrity. On the 1962 Glamour covers, the words *college, education, careers* came up frequently. Sasha, herself, had been surprised when she processed the words, their size, and frequency. She concluded that we need another big feminist wave right now. 'Sasha's' synthesis page drew from feminisms, deconstructionism (in the sense of relationships between text and meaning), and semiotics. She was particularly interested in feminist writers who wrote about images of the body. In the reflection class she said, "I am thinking more about what it means to be a human woman, in this place and time. I am alert." She also shared that she had not self-identified as a feminist a few weeks ago, but she sure was one now.

I Make Change

'Todd' is a twenty-something student with a great sense of humour and a snappy wit. He had been working at a big box electronics store in sales and thought there might be more to life. He was great to have in the class because he could lighten a weighted atmosphere with a well-placed, clever remark that often acted to re-focus attention. He was very unsympathetic, however, to the feminist theories we were exploring. He did not see women as being in any way discriminated against or disadvantaged. When we looked at the Statistics Canada analysis of what women earn as compared with men and it was revealed that women make 70 cents on the dollar, he was skeptical, as were many other students of both genders. He said, "If this is true and I was getting 70 cents on the dollar, I'd be really mad."

What evolved into his Critical Theory Fair project was a very cleanly designed booth that stood beside a notoriously unfair drinks machine, situated beside an equally shady change machine. Both machines had been reported by students as never giving the right change. The

sign on 'Todd's' booth said, *I Make Change*. He sat there with a little cash box and made change for people who needed change for the drinks machine. If a female came up for change, he would make accurate change. If a male came up, he would give him 70 cents on every dollar. He would eventually make the right change but not before handing the 'changee' a pamphlet with info about economic state of women in Canada; it even included a section on how many women sat in Canada's Parliament, the Alberta Legislature and on Boards of Directors of major companies. 'Todd', in his own way, *made change*, as was indicated in his clever title. At the reflection class afterwards, Todd said, "Ok, I'm a closet feminist."

These stories are examples of culminating work that emerged out of collaborative inquiry in an atmosphere of creative complexity. The learning that took place was very much owned by each student and was self-directed in several aspects, but it emerged from the web of relationships in a safe, supportive, but highly charged and creative learning community. Many different kinds of transformations also took place, not out of the urging, direction, or expectation of the instructor, but as a function of the work of the collective. Influence was extended beyond the collective into the real world of the Critical Theory Fair.

Conclusion and the Missing Relationship

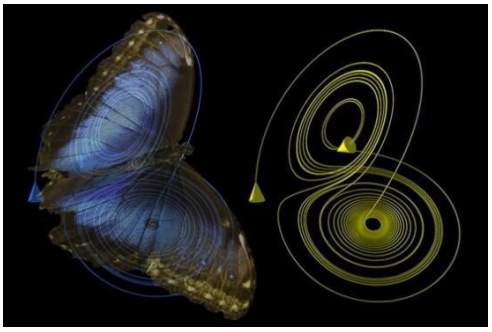

fig. 1. Morpho butterfly overlayed over one of two trajectories of the Lorenz attractor. The starting point of the two trajectories differ by one-100,000th of a unit, and their paths start to diverge after 23 time steps. Credit: Creative Commons | Asturnut (butterfly), Creative Commons | Hellisp (attractors)

Entering into a space of unknowing, places learners (educators included) in vulnerable but exciting positions. Embracing chaos and complexity heightens these qualities. By using a chaotic mix of metaphors and stories, this document seeks to reveal active learning in a collaborative and creative context of complexity. Over the course of the term, students and instructor alike find that their willingness to risk growth – they find it easier to accept a state of "unknowing.' In the often-uncomfortable state of unknowing, everything seems equal – truths from sources that appear reliable, noise from sources that seem less so, personal experiences, feelings, opinions of others; they all congregate and start to form relationships. It is in using the processes (often visual and experiential) that allow most-likely truths to surface, that meaningful learning can takes place, in ways that make sense to each student. Assessment in this chaos has not been discussed, but suffice to say it is an imperfectly translucent process of discourse and reflection on higher order tasks, coupled with an exam for lower order thinking or, in the words of Sergeant Joe Friday of Dragnet fame (television show of the mid-20th century), "Just the facts, Ma'am - nothing but the facts." Both could use some evaluation and revision.

Although I constantly reflect and create with my students, change and adapt as I go, I ache to have a colleague or two in the classroom - someone with whom to share the experience and co-construct different types of meaning. I think of the supposedly failed experiment of 'team teaching' of the 1970s and, would love to give it another whirl in the 21st century. I think it would look different and be informed with greater research into learning in all its domains. Collaboration as "active construction of mental illumination through cycles of brain-based, transformative learning," is something I yearn to engage in with another educator on a similar

quest.[90] When something really exciting happens in a class I literally run to find one or two colleagues who share my interests in learning/teaching/learning. They do the same with me, but the description is not the experience, and is thinner in the telling. It is like travelling alone and sharing the photos on your return; as satisfying as it might be, sharing the actual experience with a loved one is so much richer.

I must be patient and alert. Edward Lorenz, a father of modern chaos theory, posited in 1961, that when a butterfly flutters in Brazil it could cause a storm in Texas.[91] Relationships and chaos are delicate, nuanced, and only reveal their patterns in their many mysteries over time and space. Perhaps a butterfly is fluttering right now in Africa that will cause a storm of collegiality right where I sit.

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[90] Daniel Glisczinski, "Lighting Up The Mind: Transforming Learning Through The Applied Scholarship of Cognitive Neuroscience," *International Journal for the Scholarship of Teaching and Learning* 5, no. 1 (2011): 11, https://doi.org/10.20429/ijsotl.2011.050124.

[91] Edward Lorenz, *The Essence of Chaos* (Seattle: University of Washington Press, 1995), 181.

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The Princess and the Plesiosaur – Installation Exhibition

Interactive Installation exhibition extends the ongoing exploration of the notion of princess. The work includes video (projected onto floor and walls), robotic figures constructed of welded steel farthingales, reclaimed crochet lace, bones, feathers, twigs, molded willow branches, Roomba vacuums. Esplanade Art Gallery, Medicine Hat, Alberta.

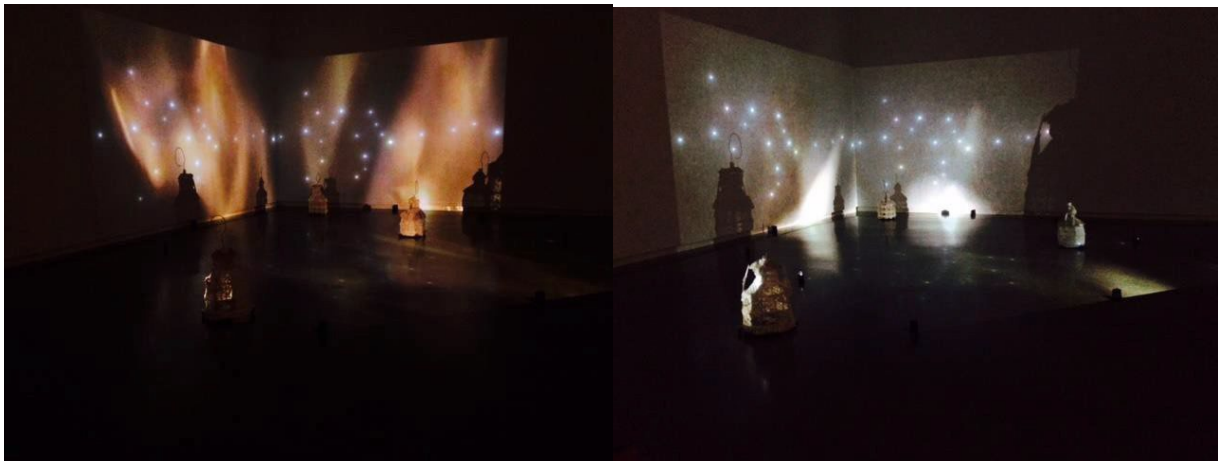
Financial support from the City of Medicine Hat, the Alberta Foundation for the Arts, the Canada Council for the Arts, 2017.

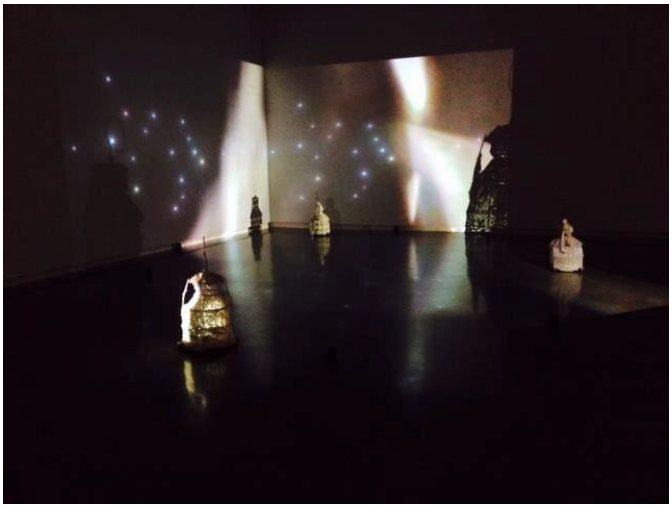
Sadly, the exhibition tour was indefinitely postponed due to Covid-19 restrictions in public galleries.

The Princess and the Plesiosaur – Video

Deborah Forbes (Rory Mahony, videographer).

https://vimeo.com/114837011





Not All Who Wander… - Documentary Video

This 34-minute video documents the public workshops (*Brief Encounter, Encounter*, and *Late Encounter)* that accompanied the *Princess and the Plesiosaur* exhibition.

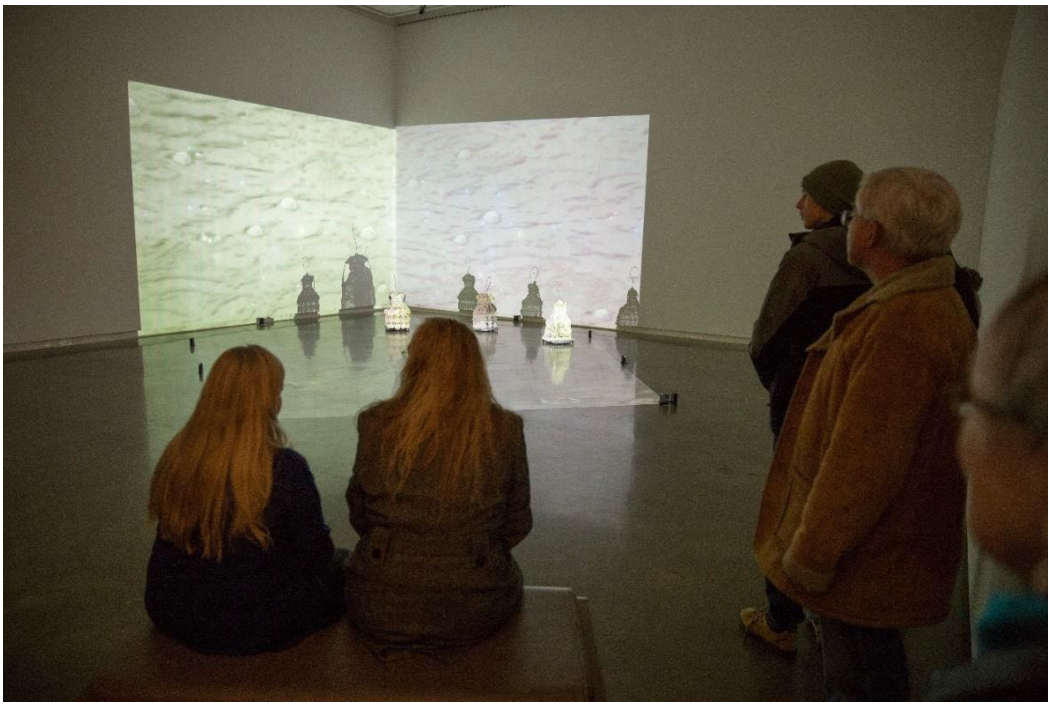
Inviting viewers from many walks of life, to collaborate in a workshop at the time of the *Princess and the Plesiosaur* exhibition (*Brief Encounter*, and *Encounter*), and then also come together again six months later (*Late Encounter*), unleashed new curiosities that then fueled new art-building directions for me, and extended curiosities in many directions for participants. These powerful workshop collaborations are documented in this video, *Not All Who Wander*…

My art-building processes are created in collaboration with artists, tradespeople, as well as with children, whom have had input into sound and visuals. I make most of the final decisions, but my curiosities open to the unexpected ideas and approaches of others; I value the connections than emerge out of collaboration. I invite chaos and wait for the work to provide direction as it emerges from complexity.

Not All Who Wander… - Video

Deborah Forbes (Rory Mahony, videographer).

https://vimeo.com/114837011



***Shadow Princesses* – Installation Exhibition**

Forbes, Deborah. *Shadow Princesses*. Interactive Installation work including video, draped printed screens, floor mirrors, steel figures. Exhibited on tour in public galleries: Esplanade Art Gallery, Medicine Hat, Alberta; Art Gallery of Swift Current, Swift Current, Saskatchewan; Thames Art Gallery, Chatham Ontario, Little Gallery, Prince Albert, Saskatchewan, Brandon Art Gallery, Brandon, Manitoba.

Shadow Princesses explores the history of the notion of 'princess' as a human construct, which has somehow persisted with all its fictitious inflations into the 21st century. 'Princess' has been a major research and artmaking focus for me for more than 20 years.

Financial support from the City of Medicine Hat, the Alberta Foundation for the Arts, the Canada Council for the Arts, Saskatchewan Arts Board, Ontario Council for the Arts, Manitoba Arts Board. 2007 – 2013.

Shadow Princesses – Exhibition Catalogue

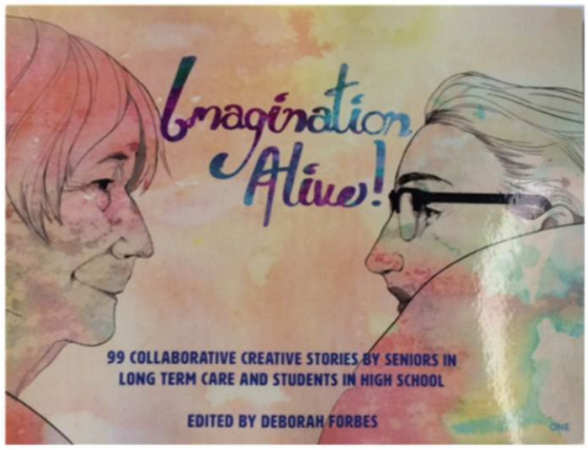
Marion, Joanne MFA (curator) and Jennifer Eiserman PhD (essayist). 2010.

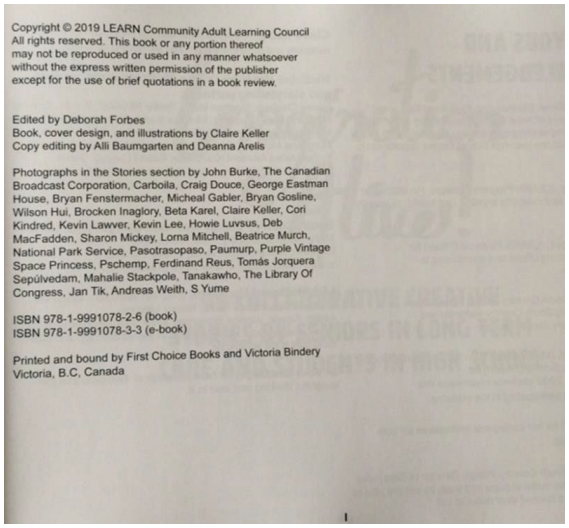
http://www.deborahforbes.com/pdf/Shadow_Princesses.pdf

Imagination Alive! 99 Stories by Seniors in Long-term Care and Students in High School (Book 1)

Forbes, Deborah (Ed). *Imagination Alive! 99 Stories by Seniors in Long-term Care and Students in High School.* Victoria. BC: First Choice Books. 2019. NB. Produced to document an audacious, creative, collaborative story-writing project with high school students in regular high school classes (not self-selected volunteers), and seniors with dementia. These stories do not attempt to be oral histories and are joyously not!

Full text of this book is available at https://classroomcoach.weebly.com/copywriting--editing.html





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