

AE600 Thesis
Disrupting Adult Education Program Planning:
Creating a Spirals Model of Emergent Planning for Creative, Connected Change

Jamie Mayoh-Bauche

201405216

Master of Adult Education Program
St. Francis Xavier University

Submitted to Dr. Nancy Peters

November 2, 2018

Abstract

The field of adult education program planning has been challenged to move away from its linear, prescriptivist roots in technical rationalism; however, progress towards more responsive approaches to planning has been slow. Unlike many areas of adult education scholarship, program planning models have not been informed by the emergent ontology of complexity theory nor have they attended to the applied practice of emergent planning within design thinking which complements complexity theory. The purpose of this theoretical and model building study is to examine the opportunity for complexity theory and design thinking to offer an emergent model of adult education program planning. This research and model building was performed with the use of visual prototyping tools, including sketching, mind-mapping, and story-boarding. It proposes a complexity-informed program planning model called the Spirals Model, using the analogy of a logarithmic spiral to present six principles for emergent planning: attend to context, connect, disrupt, iterate, be playful, and be creative. Ultimately, this study suggests that emergent processes, such as those found within complexity theory and design thinking, can fruitfully inform program planning by making the planning process more relational, playful, and responsive to change. It presents specific frameworks and tools to assist planners in adopting emergent planning practices.

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Chapter 1

Introduction: Setting the Stage

In recent decades, adult education scholarship and practice have begun to move away from modernist ways of knowing to embrace a variety of philosophical perspectives and a diversity of voices. However, the field of adult education program planning has been slower to make this move as evinced by the underrepresentation of critical, feminist, postmodern, and other alternative viewpoints in the field (English & Mayo, 2012, pp. 59-60). Some adult education planning scholarship and models, therefore, conceptualize planning practice as a linear, prescriptive activity, reflective of a now dated, modernist ontological orientation. The result is that adult education program planning may be out of line with emerging understandings of the multifaceted, indeterminate nature of reality. Program planning theory “has been built largely on a foundation of technical rationality, and this limits its usefulness for understanding and guiding the complex, indeterminate nature of practice” (Sork, 2010, p. 159). In order to address this problem and to answer calls from within adult education program planning for a greater diversity of theoretical perspectives in the field, this research study will explore the emergence-oriented perspectives of complexity theory and design thinking which provide an alternative orientation for adult education program planning. I propose a planning model centred on spiral figures. The journey towards the creation of this model has been both an academic and personal pursuit, informed by what I have learned in my research and by who I am as a planner.

Positionality of the Researcher

I bring a perspective centered on curiosity and a passion for education to my research. I am an ardent learner and continually pursue studies on a vast array of topics for the joy of learning. I have been involved in formal education throughout most of my adult life but pursue

other approaches to learning including online courses, listening to podcasts, reading, and learning new skills through experience. I have a particular interest in topics related to education and seek to be continually informed regarding instructional design, the role of play and games in learning, and varying approaches to pedagogy. As a parent of two young children, I have come to understand and integrate a variety of approaches to early childhood education into our life. I am involved with my children's alternative school which focuses on learning through art, nature, and play. I have also put my passionate interest to work by creating a website (curiouskidsadventures.com) which focuses on learning with kids through community and travel.

As I make my way on my knowledge journey, I have often been drawn to topics related to spiritual and philosophical reflection. I am a big picture thinker. I readily create connections between disparate information and attempt to draw back to understand the context of the ideas I am exploring. I pursued undergraduate studies in literary theory, theology, and philosophy to gratify my appetite for big picture thought. I am a feminist and have long had an interest in critical and post-modern perspectives, though I have not been fully satisfied with their ability to reflect and affect reality. I have reflected on how to hold both an understanding of the socially constructed and fragmented nature of reality together with my personal spiritual sense of a coherent, yet not fully knowable, universal order which calls us to work towards an increase in equality and opportunity for all. I have therefore been drawn towards complexity theory, design, and other philosophies of emergence as possible alternative conceptualizations of reality that transcend both positivism's untenable certainty and post-modernism's self-defeating relativism. I strive to make connections and view the big picture not only in my personal learning but in my professional roles as well.

As an instructor, program developer, and program administrator, I have been involved in the full range of program planning activities. Throughout my career, I have planned and taught programs for a variety of adult learners, from young adults with disabilities to apprentice welders and electricians to senior public servants. My career began teaching pre-employment programming to individuals with disabilities and significant barriers to employment. I have also taught college courses in communications and computing as well as professional development sessions in a leadership development program. In addition to instructing, I have been involved in many educational planning efforts. In my work within a community-based organization, I took on a leadership role in developing and monitoring outcomes-based evaluation models for programs within the organization. I later managed multiple English as an Additional Language programs, supervising many instructors across a large geographical area. My current role is as a program coordinator at the Johnson Shoyama Graduate School of Public Policy, a joint school at both the University of Regina and the University of Saskatchewan (www.schoolofpublicpolicy.sk.ca/). In this role I coordinate policy training for public servants and governance training for representatives on public sector boards. My passionate interest in how online tools may be used to facilitate meaningful, interactive learning has led me to become involved in planning the development of online offerings for the school's graduate courses. The variety of educational tasks and contexts with which I have been involved has offered me rich fodder in the consideration of educational planning processes.

Background to the Problem

In my professional experience I have witnessed the limitations of planning in a linear fashion; this is especially evident when utilizing outcomes-based approaches required by funders. In the differing environments in which I have planned educational programs, I have

consistently encountered practices that limit my ability to respond appropriately to the needs of the learners and our community. Sometimes restrictive planning practices arise from the culture of the organization and the people within it; for example, when management and practitioners in the educational field are comfortable doing things the way they have always been done or when courses, schedules, syllabi, and assessment plans are planned in advance with little input from learners or community stakeholders. Other times, the pressure for linear planning models comes from without. Even within dynamic organizations excited to meet the needs of communities and learners, I have encountered situations where government funding requires planning work be done well in advance, often before learners have even been identified. I have also been involved in Request for Proposal processes that pressured my organization to lay out details of our proposed educational offerings in advance, often at short notice. Funders' focus on measurable outcomes, often with an economic bent, have put pressure on me to work towards goals identified well before instructors have ever encountered the learners rather than to work collaboratively with learners and to respond to their needs. I have also taught programs with overly planned, prescriptive curriculums. Consequently, I have had to struggle to create space for learners' interests and to find creative ways to respond to individual contexts. All of these challenges to fluid, contextually-responsive planning have prompted me to try to find a framework that will enable me to more effectively connect to learners' experiences, environments, and needs.

Challenges and Promises in Program Planning Theory

Adult education planning models have been critiqued for failing to connect on many levels. For instance, Cervero and Wilson (2006) note the disconnection of planning models from the needs and wants of those who are structurally disadvantaged and point to ongoing calls in the

programming planning literature for more attention to the contexts for planning. Several decades ago, Sork and Caffarella (1989) admonished scholars in the field that contextual realities may be so influential as to render planning theory immaterial. Cervero and Wilson (2006) conclude that this confirms “the inability of planning theory to articulate any particular understanding of how context works” (p. 23). Scholars have also noted that program planning models are not only frequently disengaged from context, but also from the very learners they are trying to serve. Conventional planning models may not sufficiently account for the complete experiences of learners as they do not explicitly address holistic and embodied ways of knowing (Zupan, Stritar, & Nabergoj, 2014). While cultural context is of growing interest in the field, Sork (2010) observes that various forms of diversity, including cultural diversity, are not always explicitly reflected in current models of practice.

Existing models of program planning may also be characterized by a lack of focus on creativity and aesthetics. As early as the 1920s, Lindeman (1926) was drawing attention to the importance of creativity and beauty in the field. Knowles, in his seminal 1970 work, also exhorted planners to consider adult education as an art form and repeatedly called for consideration of the physical space of instruction, among other elements. More recently, Sork (2010) has asserted that a generative metaphor for the future of planning is the theatre stage, specifically the improvisational stage, arguing that the stage, like adult education, offers drama, creativity, and artistry. In the same text, Sork (2010) proposes that the aesthetics of planning and delivery are an area of future research in the field. However, despite the decades that have passed since adult educators first took up the call to increase creativity and artistry in the field, Sork (2010) notes that the aesthetics of planning have received little attention and that creativity in general has not been treated thoroughly. While arts-based practice and creativity have received

more attention in the field of adult education (Clover, Sanford, & Butterwick, 2014; Lipson Lawrence, 2005; Roy, 2014), this has not extended to the realm of planning practice.

The failure of planning theory to be appropriately connected and creative may be linked to the underlying technical rational basis for educational planning. In fact, Sork (2010) has explicitly critiqued conventional models of planning as being “incompatible with current understandings of the complex context in which planning occurs” (p. 159). It could be argued, then, that educational planners, like other Western thinkers, have fallen prey to what Capra (1996) described as a crisis of perception, a view of the world that is inadequate in the face of its complexity (cited in Semetsky, 2012, p. 54). As Semetsky suggests, the technical rational practice of planning based on predetermined outcomes, set activities, and existing knowledge leaves little room for emergence and results in rigidity instead. Although there has been an influx of diverse voices and numerous critiques of adult education planning, these have not been able to shift the overall focus of the field and, when it comes to planning, practice has become homogenous. In fact, Sork’s (2010) description of a field dominated by white North American men, together with the observation that most recent models of program planning in adult education are merely updates of models from the mid to late 20th century, suggests that the planning field has become static. And, as complexity science observes, stasis is death. So where can one find an alternative conception of reality that accounts for complexity and allows for emergence?

Adult educators have begun to look in the same direction as many thinkers in the sciences. Spurred to move beyond a Cartesian-Newtonian worldview by advances in ecology, organismic biology, and quantum physics, some planners have begun to embrace an understanding of reality as fluid, interconnected, and holistic. This conceptualization is expressed

in complexity theory and design thinking. Tisdell (2011) asserts that a complex view of our discipline may help adult education overcome some of the challenges of what she suggests is a dwindling state of practice.

I find that there is a strong case for increased application of complexity theory and design thinking when it comes to adult education planning. Adult education scholar Alhadeff-Jones (2012), for example, identifies the use of complex approaches as a partial remedy to both overgeneralization and fragmentation produced, in part, by the formal institutionalization of knowledge. Other adult education scholars have embraced the richness of complexity theory as a way of deepening understanding of topics such as experiential learning (Fenwick, 2003, 2006) and transformative learning (Lange, 2012, 2015). For me, these treatments demonstrate the promise of complexity theory and emergence in informing adult education program planning. Almost twenty years ago, Karpiak (2000) made a rare connection between program planning and complexity theory which “challenges us to plan in ways that more closely align with human action and interaction and less with machine-like, behaviouristic principles” (p. 40). She states that “they invite us to discover alternative models – open-ended, open system models that allow for the outburst of an idea, an inspiration, a problem or chance” (p. 40). While Karpiak offers an intriguing insight into the promise of complex planning, her brief treatment of complexity informed planning was primarily a prompt for others to pursue its promise rather than a thorough treatment of her own.

More recently, adult education scholars who engage with complexity theory have been inspired by the rejection of traditional borders and have approached their research from a variety of complementary viewpoints. For instance, Lange’s (2015) explicit promotion of a living web approach to transformative learning provides both an example of and an argument for this

boundary crossing technique. Karpiak (2000) and Chance (2010) also combine disciplinary perspectives such as chaos theory, design thinking, evolutionary science, and mysticism as lenses for understanding educational topics. Fenwick, both on her own (2006) and in her work with Edwards (2013), has explored complexity theory as it relates to experiential adult learning, together with varying perspectives such as Deweyian pragmatism and actor network theory. These examples suggest the need for a multi-disciplinary approach to my research on emergence within adult education program planning. The promise of emergent practices within design thinking, however, has not yet been fully addressed within adult education scholarship.

Statement of the Research Problem

The purpose of this research is to bring an alternative perspective, that has previously been applied to instruction and learning, and apply it to program planning. This is important given that planning methodologies determine if, and how, learning activities function. I anticipate that this study will make an exploratory contribution to the work of moving adult education program planning away from technical rationality. I believe this is especially important in today's neo-liberal environment as strictly technical rational approaches to planning are easily co-opted to serve funder and other neo-liberal interests.

In order to plan in a way that is consistent with a complex understanding of how change occurs, we must first recognize planning practices that limit the possibility of emergent change. Often these have their roots in technical rational perspectives. A complexity-informed educational reform initiative in Australia (Snyder, 2013) called the "Learning to Learn Project" explicitly identified a number of approaches that the project intended to *avoid*. These included:

- Excessive formalism and quantification;
- Understandings of planning as a useful activity in itself;

- An institutional view of “human resources”;
- Concepts of leadership as about authority;
- Centralist control typical of bureaucratic and managerial thinking. (p. 18).

Being aware of the primacy of technical rational planning approaches may help planners identify these tendencies in their own thinking, and in the systems in which they operate.

Perspectives centred on emergence provide significant opportunities to answer calls within adult education program planning for an alternative to the positivist perspective inherent in the technical rational approach (Wilson & Cervero, 1997, 2011), an increase in creativity and artistry in the field (Knowles, 1970; Sork, 2010), and increased responsiveness to context (Cervero & Wilson, 2006; Sork, 2000, 2010). I was inspired to consider design thinking as a complement to complexity theory by the increasing treatment of its application in education more broadly (Cassim, 2013; Scheer, Noweski, & Meinel, 2012) and higher education specifically (Chance, 2010; Crichton, 2013; Donar, 2011; Welsh & Delher, 2012). I have chosen to combine two perspectives on emergence from vastly different disciplines in order to honour the importance of transcending boundaries within studies of emergence.

Purpose of Research and Research Question

The purpose of this study is to examine the opportunity for complexity theory and design thinking to offer an emergent model of adult education program planning. It strives to answer the following questions:

1. How can an understanding of complex adaptive systems and the role of self-organization, adaptation, attractors and disruption in complex change provide a more fruitful ontological basis for program planning?

2. How can emergent planning approaches provide an answer to calls within the field for more creative, context-responsive, and connected program planning models?
3. How can creative inquiry through arts-based methods be used to engage with theory?
4. What does an emergent model of program planning look like?
5. What applied tools or scalable practices might program planners use in their work to promote emergent change?

Research Methodology and Rationale

I have undertaken a theoretical study and model building exercise. My review of the literature includes a review and analysis of both the theoretical and applied research on emergent approaches to program planning in adult education and other complementary disciplines. This study can be classified as theory building research that Fernandez, Lehmann, and Underwood (2002) suggest is a particularly appropriate method for the study of emergent phenomena. Like other emergent phenomena, the use of emergent planning techniques in adult education lacks a strong basis in existing theoretical models. Therefore, the work of theory building research is to “advance the academic knowledge and, at the same time, [be] applied in the field” (Fernandez et al., 2002, p. 111). In this study, I have utilized existing theoretical texts and empirical research on emergent planning in order to further theoretical understanding of emergent planning in adult education.

I have also been careful to focus on implications for practice and applied strategies for planning in an emergent manner. I have worked both to move from current practice to theory (in a manner similar to that of grounded theory development (Merriam & Tisdell, 2016)) and to move from my theoretical model to future practice by utilizing arts-based approaches to inquiry which I present as tools for emergent planning which practitioners may wish to adopt. I have

therefore included a model building aspect in my theoretical study because approaches to program planning in adult education that are explicitly informed by complexity and design thinking are rare and more foundational research in this area is required. The emergent ontologies considered in this study therefore place a high value on transdisciplinarity.

My research approach has been informed by the work of Lesley Kuhn (2008), University of Western Sydney, who explores complexity theory as a theoretical framework for educational research. Kuhn has worked across disciplinary borders in her own scholarship in order to elucidate the promise of complexity in social inquiry and research. Kuhn, however, offers a number of caveats for educational scholars who wish to utilize complexity as a framework for their research. First, Kuhn (2008) notes that complexity does not substitute for thoughtfulness. She then exhorts researchers to critically engage with complexity theory while building their capacity for critical thinking and research. She asserts that researchers need to do more than understand complexity concepts; they must actively adopt complex habits of thought eschewing the predominant Newtonian paradigm of positivist thought. Kuhn also warns researchers not to assume that the descriptive aspects of complexity theory stand as prescriptive injunctions, noting that complexity theory is descriptive and education is goal oriented. My use of arts-based research practices has helped me to engage in a nuanced and creative way with complexity and apply complex methods of thought in my research. In order to engage with the literature and propose a model of emergent program planning, I used creative inquiry methods centred on the use of arts and design-based activities and created numerous original figures intended to clarify and extend program planning theory. To my knowledge, the use of arts-based processes has no precedent in the field of adult education program planning scholarship. Kuhn's final warning to researchers, though, is to view complexity theory in its historically and culturally situated milieu

rather than viewing it as the culmination of original thought. I have attempted to contextualize complex approaches to planning and make connections to other relevant areas of theory and practice throughout this thesis.

Definitions

This study contrasts an approach to *program planning* influenced by *technical rationality* with an emergent approach informed by *complexity theory* and *design thinking*. Therefore, I will provide a brief definition of the way in which these terms are understood in their application in this study.

Program planning. Program planning is a broad concept which encompasses an array of activities throughout the whole of the educational process. Linear approaches to planning reference planning activities done: before (needs analysis, development of learning outcomes, scheduling), during (administering and adapting learning activities), and after (evaluation, adaptation) instructional activities. Program planning encompasses both logistical and educational activities. Adult education program planning scholarship and practice overlap significantly with teaching activities and planning in other relevant disciplines (Sork, 2010), K-12 curriculum planning, and educational reform theory. Early influences on adult education program planning such as Tyler (1949) spring from the area of K-12 curriculum planning. Adult education scholars have presented numerous models of program planning which will be treated in detail in Chapter 3.

Technical rationality. To understand current adult education program planning scholarship and practice one must understand the technical rational tradition and its underlying assumptions. As Schön (1984) observed, technical rationality is rooted in an assumption that expert knowledge is ascendant to and should form practice. Because of its roots in positivist

philosophy, which privileges data driven inquiry and the scientific method, technical rationality seeks general laws that can be applied systematically. It aims to extend Newton's search for universal scientific truths into social realms. Professionals, as those who understand and can apply such truths, gain power and special status. Within program planning, technical rationality promotes "idealized, linear models (Sork & Caffarella, 1989; Sork, 2010) which privilege skill-acquisition, technique, and quantitative evaluation" (Selvaraj, 2014). Program planning models influenced by technical rationality often also incorporate specific philosophies of education (for example Knowles' 1970 model is generally classified as both technical rational and based on andragogy) (Caffarella & Daffron, 2013). Within the adult education literature, the terms "conventional" and "traditional" are applied to planning models springing from technical rationality.

Complexity theory. Complexity theory aims to understand the functioning of complex systems, in which the global behavior of systems cannot be explained by the sum of their parts. Complexity theory asserts that the observable global reality of a system is an emergent result of the interactions of the elements within the system and the system's interaction with its environment. It posits that complex systems are self-organizing, non-hierarchical, and self-generating. Complexity theory springs from complexity science rooted in the study of systems within the fields of mathematics, biology, physics, and computer science, and is applied in understanding complex human systems. It is often posed as a more relational and holistic alternative to the reductionist Newtonian-Cartesian view which has shaped traditional scientific and intellectual endeavours. Scholars have explored many areas of adult education through the lens of complexity (Allhadeff-Jones, 2012; Fenwick, 2003, 2006; Fenwick & Edwards, 2013; Lange, 2012, 2015). Karpiak (2000) argues that adult education program planning can be

reimagined and reinvigorated through a complex perspective, though scholars in the field have largely failed to take up her challenge.

Design thinking. Design thinking springs from practice in traditional design fields aimed at solving design problems. Design thinking is distinct from other forms of problem solving. While no one definition or process of design thinking exists, it is characterised by a solution focused approach which involves defining the solution and the problem reciprocally, taking a systems perspective, utilizing both logical and creative processes, iterating, and fostering emergence throughout the design process. Design thinking generally involves prototyping in forms such as sketching, model building, or roleplaying and can be undertaken collaboratively. Design theorists have treated the planning of educational endeavours through a design lens (Banathy, 1991; Buchanan, 1992; Nelson & Stolterman, 2012) arguing that all educational planning is a design undertaking (Buchanan, 1992). While practitioners and scholars in education generally have utilized design thinking (Chance, 2010; Crichton, 2013; Scheer et al., 2012), the field of adult education has not. In this study, I will be doing the preliminary work of linking design thinking approaches with adult education practice.

Plan of Presentation

In this thesis, I provide a context for my research within adult education program planning scholarship. I propose emergence, springing from complexity theory and applied in design thinking, as an alternative ontological basis for adult education program planning. To do this, I describe complexity theory and design thinking, and highlight treatments of these perspectives within adult education and the educational literature more broadly. In exploring the implications of emergent approaches for program planning, I provide an analysis of theoretical and applied literature on complexity-informed planning. I finish by proposing a model of

program planning (the Spirals Model) informed by complexity theory and design thinking which explores the implications of complex approaches for adult education program planning practice.

Chapter 2

Methodology for Study

This chapter outlines the methodology that I used to plan and undertake this study. It also discusses issues of trustworthiness. This study used an emergent research method informed by complexity theory and design thinking. My process was non-linear as I developed both my background research and my model concurrently. Throughout the whole of this research process, I continually redefined my research questions and the ways in which I approached them. I have also utilized a number of creative inquiry approaches that I describe in this chapter.

Sources of Information

My search for relevant theoretical and empirical articles was conducted using databases including ProQuest, ERIC, SAGE Journals, and the Wiley Online Library. Due to the interdisciplinary nature of my topic, I consulted a broad range of journals. I also reviewed the full online archives of the following journals for relevant articles: *Adult Education Quarterly*, *The Canadian Journal for the Study of Adult Education*, *International Journal of Lifelong Education*, *Journal of Adult and Continuing Education*, and *New Horizons in Adult Education and Human Resource Development*. I conducted my searches using the key words “systems thinking,” “complexity theory,” “complexity,” “emergence,” “design thinking,” and “design theory” in a variety of combinations with the key words “adult education,” “education,” “program planning,” “policy planning,” “instructional design,” and “planning.” I prioritized articles and books published since 2010, especially in regards to empirical studies.

Approach to Document Analysis

A theoretical study, including a review of research, allowed me to incorporate theory and reports of practice on emergent planning from a variety of relevant disciplines. I was able to

access a variety of examples of emergent planning by taking a theoretical approach grounded in the literature that provided a strong basis for the theorizing and model building in this thesis. I began my research by reading widely on the broad topic areas addressed in this project. In my search for more recent and applied resources, I utilized the following guidelines:

- Prioritize relevant sources from within adult education scholarship;
- Give secondary priority to sources from subsets of the education literature that are pertinent to program planning, such as education reform planning and curriculum planning, and;
- In recognition of the importance of an interdisciplinary approach within complex thinking, identify relevant works from planning disciplines that are related to and that have influenced adult education program planning.

My foundational reading in adult education program planning was informed by scholars such as Sork (2000, 2010), Wilson and Cervero (1997) and Boone, Safrit and Jones (2002), and focused on recent and influential scholarship in the field. I also read seminal literature on complexity theory and design thinking, including works that gave me a basic grounding in complexity science.

My analysis of the theoretical literature, which grounds the theoretical portions of this report, progressed naturally. I read and analyzed many texts, synthesising their content, and generating my original contributions to theory both mentally and using the visual tools discussed below. I took a more systematic approach to my analysis of the empirical literature, utilizing the strategy of document analysis. I noted that significant documentation of emergent planning processes existed, and that the analysis of documents is an important focus for research (Prior, 2003). I identified recent articles regarding the application of complexity theory and design

thinking to education, instructional design, and policy planning. These included a combination of primary and secondary documentation (Coffey, 2014). I then reviewed all of these articles performing a thematic analysis (Maxwell & Chmiel, 2014). This analysis provided me with the basis for my discussion of themes in interdisciplinary approaches to complex planning as well as my discussion of tools that can be utilised in the application of complex planning approaches.

Theoretical Framework

My research method is informed by complexity theory and the emergent approaches to planning discussed in this thesis. The research process was not a linear one as I worked to develop both my background research and my model reciprocally. I followed where my research led, continually redefining my research questions and how I was approaching them. This was often messy and uncomfortable, and meant that I needed to discard or restart portions of my work on a regular basis as my research evolved. While I struggled on occasion with the unboundedness of a complex approach to research, I, like Kuhn (2008), believe that this is one of its greatest advantages. As Kuhn states:

Complexity in this way does not offer research recipes, ‘tried and true’, but rather a space for thinking otherwise, for musing on a series of ‘as ifs’. Out of a researcher's engagement with complexity, in combination with their history of being and researching preferences, researchers can evolve appropriate complexity inspired or informed research approaches and strategies (p. 185).

Throughout my research, I did just that, integrating the knowledge that I was gaining regarding emerging processes with my personal strengths, experiences, and knowledge base in order to creatively design a research process that addressed the questions I proposed.

While an emergent or complexity based approach is not widely recognized as a theoretical research orientation, it falls into the broad category of constructivist research frameworks. Scholars treating complexity theory and design thinking state that a rejection of

positivist certainty is inherent in current approaches to both disciplines (Capra & Luisi, 2015; Nelson & Stolterman, 2012). I have knowingly integrated my interests, strengths, and personal experience into my research, acknowledging the socially situated nature of the theories that I employ and my own perspective on them. The emergent model that I have developed, likewise urges planners to be aware of and responsive to the varying contexts they function within and the impact of these contexts on knowledge. Both complexity theory and design thinking share a strong grounding in pragmatist thought (Dalsgaard, 2014; Semetsky, 2008) which is associated with the constructivist research orientation (Rodwell, 1998) but is also considered a unique approach to research (Mertens, 2015; Morgan, 2007). The design thinking processes which I have used in my work are associated with design research and participatory action research often employed in pragmatic research methods (Goldkuhl, 2011; Li, 2008).

Utilization of Creative Inquiry and Arts-Based Practice

The process of creative inquiry that I undertook for this study involved nurturing both creative patterns of thought and hands-on artistic skills. The most abstract part of my creative process involved a deliberate attempt to let go of my personal propensity to value certainty and predictability and to instead celebrate the inevitability of ambiguity and unpredictability in life. I sought to embrace, in Montouri and Donnelly's (2013) words, "the vast mystery of existence" (p. 7) despite the significant discomfort this occasioned. This involved relevant practices outside of what would traditionally be considered research. I undertook reflective and arts-based journaling, reading on metaphysical topics with relationship to emergent phenomenon (Rohr, 2016; Weber, 1986), and a regular mindfulness meditation practice.

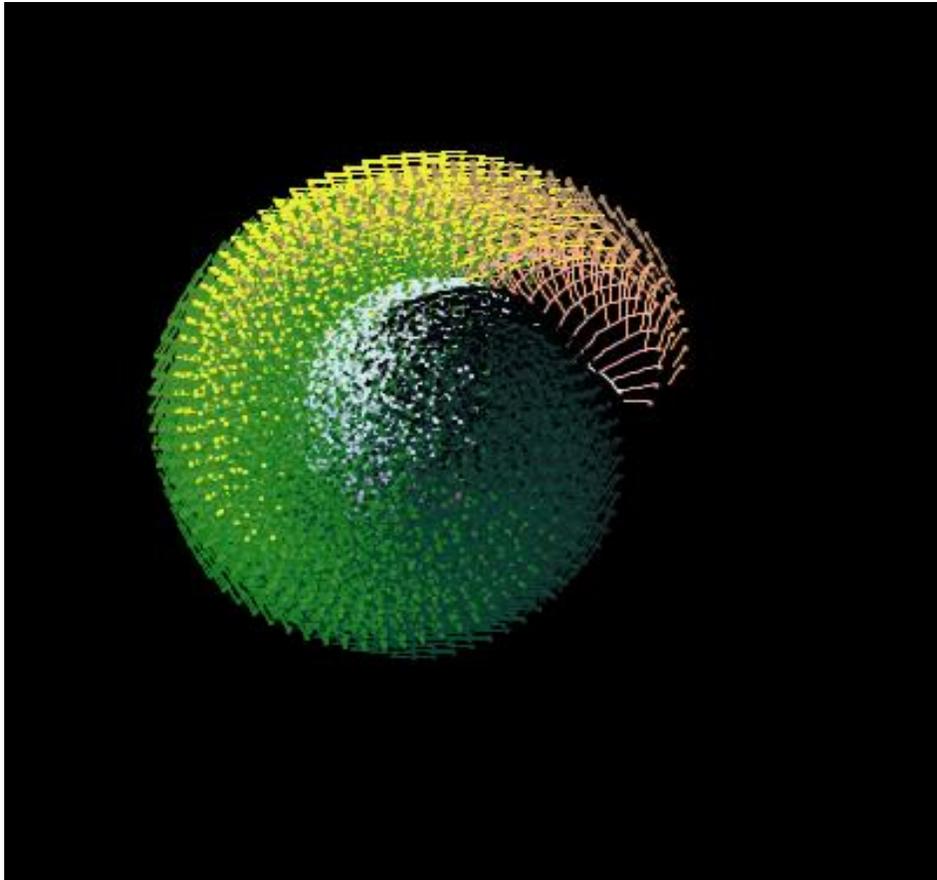
Throughout my research, I utilized a specific pattern of thought, important within design, to guide my inquiries - the process of *abduction*. Dorst (2010, p. 131) explains that abduction is a

reasoning pattern which can be contrasted with deduction and induction. If we think about deduction as *What + How = ???* and induction as *What + ??? = Results* we can see how their reasoning patterns work. In deduction, we know the initial state and the rules that govern the phenomenon; therefore, we can make predictions about the final result. In induction, we know the initial state and the final result, and are working to ascertain the how, the rules or forces that are in play to change from one state to another. Abduction is concerned, not with understanding existing phenomenon but in creating new valuable results. In abduction *What + How = Aspired Value*. In the process of reasoning using abduction the aspired value is known initially but the what and often the how are unknown. I did not enter my research process with a clear research question or limitations of inquiry. Rather, I reciprocally defined my research question and answer as I conducted my study. My research process deliberately alternated between times of intense study and concentration and downtimes to allow for reflection and more diffuse modes of thinking (Oakley, 2014). During these downtimes I would not engage in structured study or writing activities; I would instead allow personal and creative reflection to flourish unfettered. As these downtimes progressed, I would often reach a point of invigoration when I was gestating multiple unformed ideas. In order to begin to nourish and clarify these ideas I would enter back into my formal research process through creative, arts-based activities which would help organize and give form to my thoughts.

Many of the creative processes I chose to engage with during my research process play a role in complexity theory and design thinking. I undertook conceptual modelling which is a key research approach within the complexity sciences. I learned to use and experimented with the modelling software NetLogo, which is often used in complex approaches to scientific and social scientific research. On some occasions, I used this software with my pre-school aged kids which

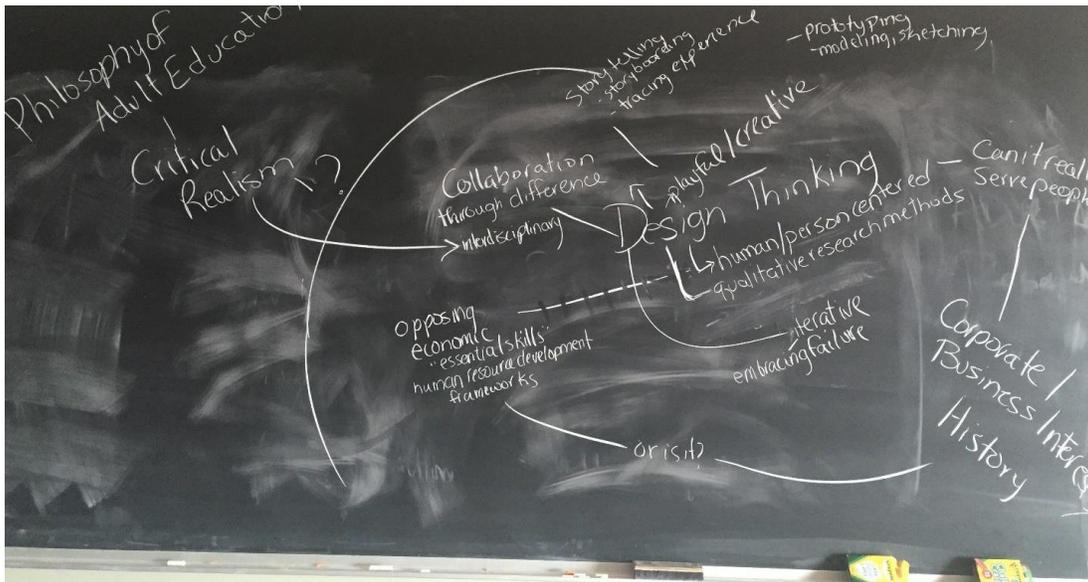
helped me take a playful and experimental approach. I focused on modelling logarithmic spirals (Figure 1) in NetLogo as I formulated the Spirals Model of program planning presented later in this study.

Figure 1: Mayoh-Bauche, 2018. Screenshot of spiral fractal model generate in NetLogo



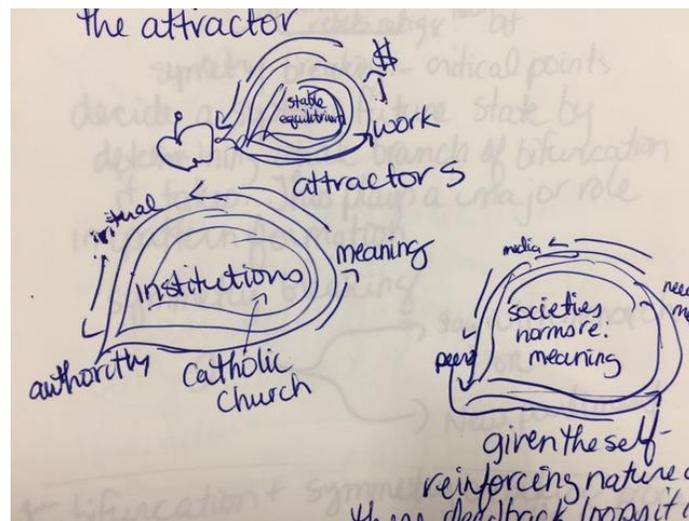
Primarily, I undertook a practice of sketching and mindmapping ideas in order to interact with them visually and to model connections in systems of knowledge. I started this practice early on in my studies as I connected the underlying philosophies that affected my research and continued it through all of the stages of my research. I often used large surfaces to map out my ideas and their connecting threads (Figure 2). Using large surfaces not only involved my creative process of making visual connections but also engaged my whole body through physical movement.

Figure 2: Mayoh-Bauche, 2018. Concept mind map



I also used sketching and visual representations to help me understand and express concepts within complexity science that were challenging for me to grasp (Figure 3).

Figure 3: Mayoh-Bauche, 2018. Study sketch



I created visual representations of concepts to assist others in understanding these concepts and the connections between ideas as well. For examples, Figures 6 and 9 helped provide the basis for my transdisciplinary analysis of program planning literature.

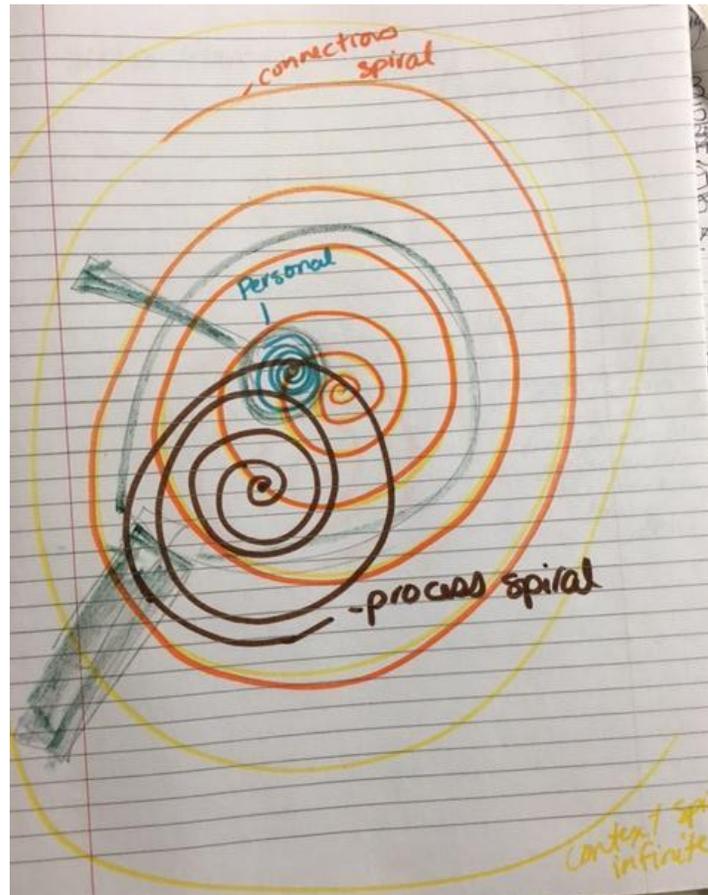
I used visual representations not only to try to make connections and clarify my thoughts but also to represent the ambiguity and uncertainty of what I was doing. The moment in *Alice in Wonderland* when Alice falls down the rabbit hole was one that I reflected upon and represented (Figure 4).

Figure 4: Mayoh-Bauché, 2018. Alice down the rabbit hole of complexity



Finally, sketching and visual representations helped me develop and express my model of program planning and its application. My program planning model and metaphors underwent many iterations. The visual representations I created helped me continue to refine my ideas (Figure 5).

Figure 5: Mayoh-Bauché, 2018. Spiral model prototypes



I also created images to help imagine what the application of my model could look like in practice. These have been integrated into the planning Vignette in Appendix A (Figures 20 and 21). The use of creative inquiry assisted me with moving beyond just understanding complexity theory and design thinking towards embracing complex patterns of thought as Kuhn (2008) encourages.

Trustworthiness of the Research

As both complexity theory and design thinking run counter to positivist understandings of knowledge, in undertaking this thesis I have adopted a number of strategies which increase trustworthiness and authenticity attuned to the complexity and indeterminacy of research. First, I

have taken a complexity informed approach to my research which aligns well with trustworthiness and authenticity frameworks of Lincoln and Guba (2007). Lincoln and Guba (2007) explicitly contrast naturalistic understandings of rigour with a conventional positivistic approach asserting that “multiple and constructed realities cannot be studied in pieces (as variables, for example), but only holistically, since the pieces are interrelated in such a way as to influence all other pieces” (p. 17). In addition, they note that “the pieces are themselves sharply influenced by the nature of the immediate context” (ibid). A naturalistic perspective is consistent with the ontological basis of complexity theory and approaches to research springing from a complex framework. Although the concept of trustworthiness is associated with qualitative research, I have used it as a lens for my theory and model building thesis, in part because Lincoln and Guba’s perspective is relevant when it comes to researching emergent phenomena. Considering concepts of trustworthiness also helped me improve the quality and relevance of my theoretical and model building study.

First, Lincoln and Guba’s (2007) criteria for trustworthiness in qualitative research includes the framework of credibility. In order to promote credibility, the authors endorse prolonged engagement, persistent observation and triangulation amongst other strategies. While the research subjects I was engaged with were texts rather than people, I made significant efforts to engage broadly and deeply with the relevant literature in order to “assess possible sources of distortion” (p. 19). Rather than rely strictly on texts that treated complexity and design within educational contexts, I engaged with foundational texts in the fields of complexity theory and design thinking, including scientific texts on complex phenomena and texts from within design disciplines. In doing so, I was able to identify and mitigate distortions and misunderstandings of the core concepts of complexity theory and design thinking that sometimes make their way into

educational applications of the theories. In order to make a move towards triangulation in my theoretical research I incorporated a variety of sources of data. I deliberately reviewed both theoretical and empirical literature. I also performed a cross disciplinary review, drawing on accounts of emergent planning in the fields of education, instructional design, and policy planning in addition to adult education.

Second, Lincoln and Guba (2007) establish criteria for authenticity in qualitative research, which are fairness, ontological authentication, educative authentication, and catalytic authentication. According to the authors, fairness requires that researchers identify and explicate multiple, sometimes, conflicting value structures, including their own. Throughout my research, I have been explicit in identifying, contrasting, and connecting various theoretical perspectives which relate to complexity theory and design thinking. I have attempted to draw out the relational, constructivist ontology that underlies a complex understanding of the world. I have also been explicit in describing my own value system and subjective perspectives on planning, which I address in more detail below.

Ontological authentication is aimed at raising consciousness or uniting divided consciousness through dialectical processes. Throughout the process, I as the researcher have achieved deeper and more nuanced ontological understandings. The resultant work is aimed at assisting others in doing the same, in laying bare some of the complexities of our world that may otherwise be overlooked, explicitly promoting and providing tools for achieving dialectical understanding. In contrast, educative authentication addresses an increased understanding by various players in the research process and is therefore not relevant in my independent theoretical study. Catalytic authentication, however, requires that research facilitate and stimulate action which I have worked to do by identifying and describing specific tools and strategies for each of the principles

of emergent planning. I have been deliberate in going beyond presenting a theoretical framework towards presenting strategies for practical application of theory.

In adopting a complexity informed approach to research, I recognize and accept as vital the role of my subjectivity in the research process. I have attempted to utilize my particular strengths (i.e., curiosity, big-picture thinking, creativity) to craft a unique model of adult education program planning. I have allowed my personal experiences with education and program planning to inform my research. I have also allowed my intuition and creative thought processes to play a role in shaping the content of my study. I acknowledge that my subjectivity can also be problematic. A theoretical research study in which intuition and creative processes play a role may be particularly prone to personal blind spots. I have had to be particularly cognisant of the trust that I place in complexity theory and design thinking to shape adult education program planning. As someone who seeks order and cohesion, I recognize that I sometimes put too much trust in what appear to be cohesive ontological orientations such as complexity theory. As someone who hopes for a more humane, connected world that is shaped by positive educational undertakings, I am tempted to take complexity prophets such as Morin (2001) on their word that complexity will improve education and the world. As a believer in the power of creativity and creating, I may not be sufficiently critical of the promise of design approaches for education. I have identified these and other challenges inherent in my subjective position and tried to mitigate them through critical reflection and the discussion of my research with others. However, blind spots being blind spots, I am aware that there may be other issues arising from my particular perspective that I have not pre-emptively identified. In regards to these, I put hope in the fact that the research approach I am taking is iterative and experimental; others' responses to my work may help correct my oversights.

Limitations and Delimitations

Situated within adult education program planning, this study is intended primarily for practitioners within the field of adult education. I was unable to extensively scan or respond to general program planning models and literature within other fields. When identifying materials for my interdisciplinary survey of empirical literature on emergent planning practice, I needed to limit the disciplinary areas I considered. I chose four disciplines in addition to adult education (policy planning, instructional design, education and design), as identified in Figure 6, and was able to locate twenty-five relevant articles for inclusion in my review. My study was limited by the lack of availability of relevant materials, especially in regards to design thinking within the adult education field. A larger number of relevant studies or the consideration of studies from a greater variety of disciplines would have made my research more robust.

The theoretical focus of my study is also a limiting factor. While I incorporated a review of empirical planning literature, it was not possible to test proposed models and principles in the field. This study, therefore, does not provide comprehensive details about emergent planning processes in action. Nor does it aim to supplant older models of adult education program planning (Caffarella and Daffron, 2013; Sork, 2000). I do, however, suggest that pairing models grounded in complexity theory and design thinking with a more descriptive, non-linear approach such as that of Sork (2000) may be helpful for beginning practitioners who desire a more holistic picture of planning issues and approaches.

Chapter 3

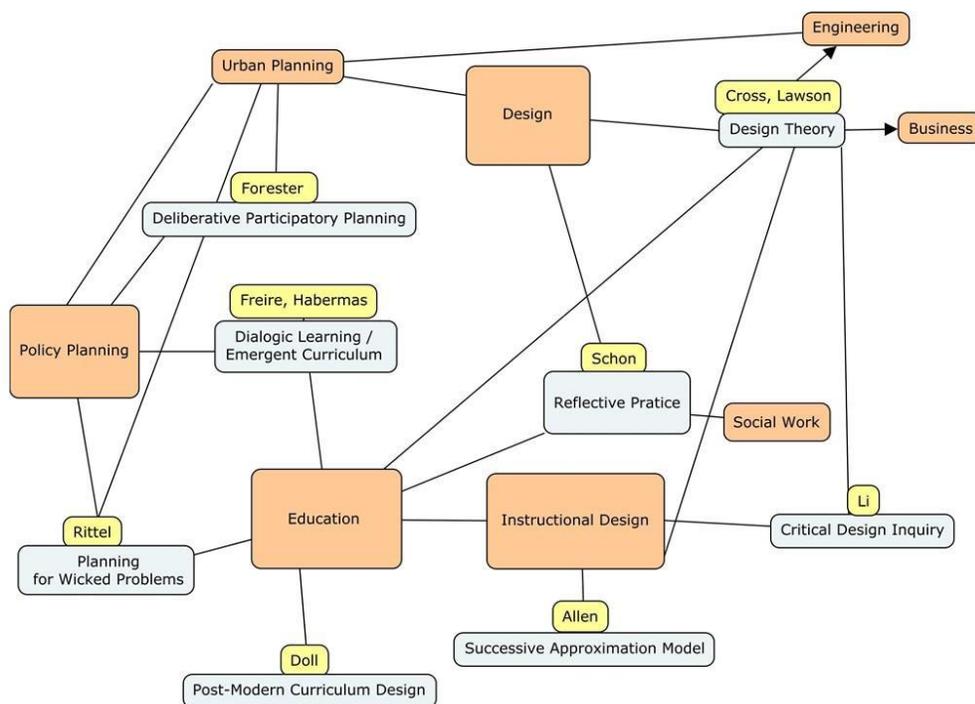
Presentation of the Literature on Program Planning

In this chapter, I move into a discussion of the theoretical and empirical literature which grounds the model building work of this thesis. Chapter 3 situates my research within the field by exploring foundational literature in adult education program planning.

Interdisciplinary Considerations and Boundaries

Adult education program planning can be a difficult field to define and curriculum planning scholarship, which primarily treats K-12 education, springs from the same roots as adult education program planning (Caffarella & Daffron, 2013). Many planning activities therefore overlap with those used in other teaching and learning contexts and with planning theory in disciplines such as health, social work, urban planning and education (Sork, 2010). In some instances, though, adult education scholars take care to avoid identification with curriculum planning literature (Käpplinger & Sork, 2014). As curriculum planning, educational reform planning, and adult education program planning, however, all employ similar educational planning processes, it is likely that planning approaches are more mutually informative than disciplinary boundaries would seem to suggest. I consequently look to complementary disciplines to inform my literature review and findings and have paid particular attention to fields in which emergent approaches to planning are being utilized. Figure 6 provides an overview of relevant planning disciplines linked to emergent approaches to planning. The disciplines laid out in the large peach boxes are those I include in my discussion of the literature on the practice of emergent planning.

Figure 6: Mayoh-Bauche, 2018. Map of planning approaches



While planning models in many dispersed fields have not always achieved the ends they set for themselves, practitioners in adult education still strive to better planning methods in the hope of improving learner experience.

Program Planning Models: Restrictive Roots and Present Promise

While varied planning practices exist and have been utilized by adult educators throughout history, many were not explored or codified as adult program planning practice. As Wilson and Cervero (1997) note, literature in the field of adult education serves to orient us away from informal and historical realities of planning towards formalized, prescriptive approaches. It seems possible that the pursuit of recognition and professional status drew the field of adult education program planning to adopt technical rational approaches in its infancy. Wilson and Cervero (1997, 2011), for example, trace the influence of technical rationality on adult education program planning to early 20th century efforts to professionalize the field. This study will

explore those approaches, springing from this phenomenon and emerging from the mid 20th century on, that are recognized as models of program planning. Figure 7 provides an introduction to some major models of adult education program planning, the most relevant of which are then explored in more detail.

Figure 7. Mayoh-Bauche, 2018. Overview of major models of adult education program planning

Model & creator	Year	Context	Key points or activities
Tyler's Technical Rational Model	1949	<ul style="list-style-type: none"> ● Presented four questions with which to frame program planning ● Laid out in a handbook designed for Tyler's students at the University of Chicago ● Aimed at creating a top-down process to meet specific, preordained objectives in K-12 school curricula 	Questions: <ol style="list-style-type: none"> 1. What educational purposes should the school seek to attain? 2. What educational experiences can be provided that are likely to attain these purposes? 3. How can these experiences be effectively organized? 4. How can we determine whether the purposes are being obtained?
Knowles' Andragogical Model	1950 /1970	<ul style="list-style-type: none"> ● Centred around his learner-centred theory of andragogy which values: <ul style="list-style-type: none"> ○ Learner self-directedness ○ Learner experience ○ Adult learning as problem-centered and related to life 	Stages of program planning: <ul style="list-style-type: none"> ● Climate setting ● Participative planning ● Needs diagnosis ● Objectives definition ● Learning experience design ● Program operation ● Evaluation
Freire's Conscientization Approach	1970	<ul style="list-style-type: none"> ● Sprang from work coordinating literacy programs in politically volatile 1960s Brazil ● The ends of learning should be the empowerment of the oppressed ● Critical of methods he terms the "banking model" (p. 73) in which active teachers deposit knowledge in passive students ● Learning is a tool for political agency 	Planning involves: <ul style="list-style-type: none"> ● Conscientization through dialogical praxis, an interactive social process ● Working with disempowered communities to explore their problems and the socially conditioned beliefs and assumptions that feed those problems ● Locals and educators working together to perceive contradictions in the everyday life of the area, encode these contradictions and present them to locals to be decoded

Model and creator	Year	Context	Key points or activities
Houle's Model	1972	<ul style="list-style-type: none"> ● Rejected Knowles' focus on andragogy as distinct from pedagogy ● Focused on context and its changing nature and on the cooperative and practical nature of planning ● Asserted planning is not a sequential activity, rather, one formed by complex interactions amongst elements 	<p>Stages include:</p> <ul style="list-style-type: none"> ● Identify possible educational activities ● Decide to proceed ● Identify and refine objectives ● Design suitable format ● Fit format into larger life patterns ● Put plan into effect ● Measure and appraise results
Boone's Conceptual Model (2002 with Safrit & Jones)	1996, 2002	<ul style="list-style-type: none"> ● Informed by systems approaches to organizational improvement ● Stressed holistic approaches linking planning activities to community needs 	<p>Explore numerous themes and activities within the overarching categories of:</p> <ul style="list-style-type: none"> ● Planning ● Design and implementation ● Evaluation and accountability
Cervero and Wilson's Planning Table Approach	1997, 2006	<ul style="list-style-type: none"> ● Traced the influence of technical rational perspectives on the field ● Asserted that planning is always a deeply political activity ● Stressed that power-play aspects of planning have long been overlooked or only cursorily acknowledged in the planning literature 	<ul style="list-style-type: none"> ● Less a fully articulated model of program planning and more of an extensive critique through which to engage with current program planning practice ● Stressed that all traditional planning activities are influenced by which parties have access to the literal and metaphorical "planning table"
Sork's Question Posing Model	2000	<ul style="list-style-type: none"> ● Asserted that practitioners should move fluidly amongst seven elements key to program planning ● Identified the primary planning activity as posing and answering questions in any or each element ● Intended to move away from prescriptive linear planning models 	<p>The seven elements of planning are:</p> <ul style="list-style-type: none"> ● Analyze context and learner community ● Justify and focus planning ● Clarify intentions ● Prepare instructional plan ● Prepare administrative plan ● Develop summative evaluation plan and formative evaluation
Caffarella (and Daffron's) Interactive Model	2002, 2013	<ul style="list-style-type: none"> ● Asserted that program planning is contextual and should be responsive to many factors ● Discussed areas of context including technology, adult learning, cultural differences, relationship building, and power and interest ● Offered many specific applied planning tools such as checklists and outlines for planning tasks 	<p>Aspects of program planning:</p> <ul style="list-style-type: none"> ● Needs assessment ● Support ● Context ● Evaluation ● Instruction ● Learning transfer ● Goals and objectives ● Budgets ● Details ● Marketing ● Scheduling

Tyler's (1949) four questions with which to frame curriculum planning are often cited as an influential early effort at prescribing activities for program planning (Brookfield, 1986; Sork, 2010). Conventional, linear approaches, in line with those of Tyler, dominated program planning theory throughout the 20th century and beyond. Early and seminal models of program planning within the field of adult education, such as those of Knowles (1950, 1970) and Houle (1972), were designed in a prescriptive manner. Wilson and Cervero (1997) argue that Knowles' 1950 work served to solidify a prescriptive set of planning principles that had been developing in the field over the previous decades. Knowles is best known for the promotion of the learner-centred theory of andragogy; the key principles of andragogy are learner self-directedness, the importance of learner experience and adult learning as problem-centered and related to life. However, in Knowles' (1970) work these principles also provide a context for prescriptive stages of program planning which are climate setting, participative planning, needs diagnosis, objectives definition, learning experience design, program operation, and evaluation. The popularity and influence of Knowles' *The Modern Practice of Adult Education* (1970) "added to the momentum of the technical rational tradition" (Sork, 2000, p. 172).

Knowles, however, did have his detractors. Houle (1972), for example, presented an approach to program planning which rejected Knowles' initial focus on andragogy as distinct from pedagogy. Houle's (1972) assumptions about program planning included a focus on context and its changing nature, and on the cooperative and practical nature of planning. Houle (1972) explicitly stated that planning is not a sequential activity but, rather, one formed by complex interactions among elements. However, in laying out the decision points for program planning, Houle (1972) again presented them in a prescriptive list starting with "identification of possible

educational programs” through “identification of objectives” and other steps, ending up with “measuring the results” and “evaluating the results” (Houle, 1972, p. 47).

Some scholars, such as Brookfield (1986), have consequently critiqued the technical rational bent of early 20th century planning processes which identified and pursued predetermined learning outcomes. Brookfield strongly took issue with technical rational planning approaches (which he referred to as institutional planning), including the sequencing of learning activities and formal assessment of learner needs. Despite these challenges, many of the most influential models of adult education – well into the beginning of the 21 century – were updates of existing models that retained the spirit of their technical rational predecessors (Boone et al., 2002; Caffarella, 2002; Caffarella & Daffron, 2013; Houle, 1996).

The most recent and perhaps most widely used model of adult education program planning is Caffarella and Daffron’s (2013) interactive model. This is an update of Caffarella’s 2002 work which explicates the twelve major steps of program planning, including assessing needs, evaluating, instructing, marketing and scheduling. Caffarella and Daffron are careful to assert that planning is a highly situated, non-linear, interactive, people-focused activity and that their model can be used interactively, in any order or combination. In their 2013 work, Caffarella and Daffron group recent adult education program planning approaches into three broad categories, presenting pragmatic approaches and radical planning as alternatives to the conventional approach. They state that their model incorporates aspects of all three categories and contest scholarship that classifies their work as a conventional model in the technical rational tradition. Caffarella and Daffron argue that updated versions of their model (Caffarella, 2002; Caffarella & Daffron, 2013; Daffron, 2005) are not conventional because they are not strictly linear, allow for entry at any point, and incorporate other approaches. They do not acknowledge,

however, that they look to Houle (1972) as an important reference point for technical rational planning though his model is presented in the same way as their own –as flexible and non-linear, allowing entry from any point.

Caffarella and Daffron's (2013) breakdown of program planning approaches into three categories (i.e., conventional, pragmatic and critical) seems to suggest that there are at least two viable families of alternatives to conventional planning models within adult education scholarship. However, this may be somewhat misleading. In a prominent recent summary of program planning literature, Sork (2010) expressed concern about the lack of engagement with alternative and critical perspectives within relevant scholarship. Although other scholars such as Wilson and Cervero (1997) have also been critical of conventional approaches to adult education planning, and many varied ontological approaches to adult education are being represented outside of planning scholarship, this has not translated into significant variation within models of adult education program planning. Caffarella and Daffron (2013) concur, noting that while there are radical change-based approaches to adult education, "very few 'models' of program planning have emanated from this approach" (p. 14). There has, though, been considerable theorizing about critical and radical approaches to adult education that is relevant to program planning.

As noted by Wilson and Cervero (1997), Freire is an early, and seminal, voice in critical adult education who laid out a planning process in his phases of the *Pedagogy of the Oppressed* (1970), although this is only starting to be recognized as such. Freire presented a process of conscientization through dialogical praxis, an interactive social process. For Freire, the ends of learning should be the empowerment of the oppressed. Much of Freire's perspective on education sprang from his early work coordinating literacy programs in politically volatile 1960s' Brazil. Freire (1970) was involved in working with disempowered communities to

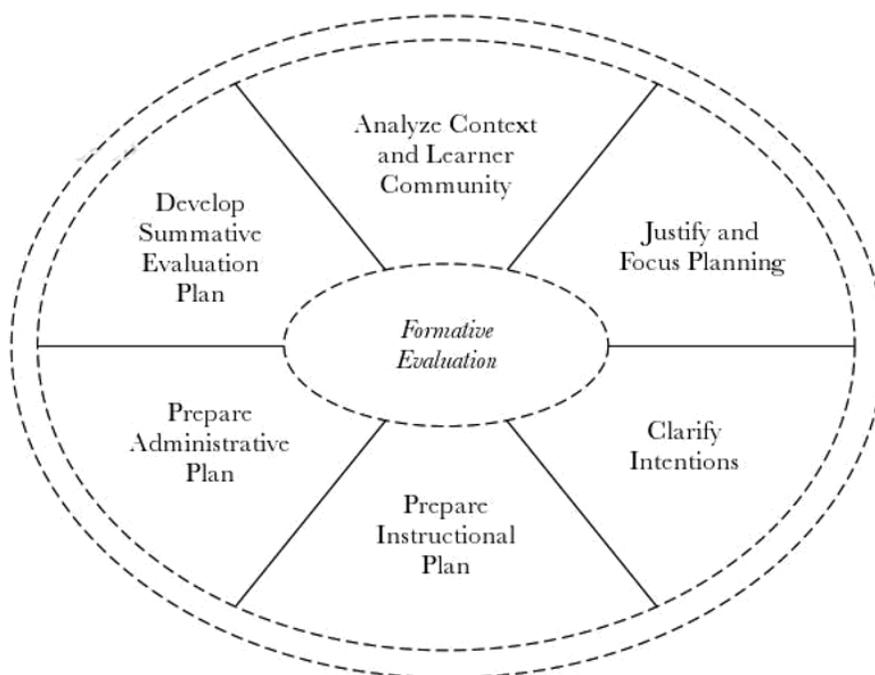
explore their problems and the socially conditioned beliefs and assumptions that feed those problems. Literacy training was contextualized as a tool for political agency as Freire was highly critical of traditional methods of education, the “banking model” (Freire, 1970, p. 73) in which knowledge is deposited in passive students by knowledgeable, active teachers. Freire’s views located education as a relational, community undertaking opposing the popular conception of the individual learner’s mind as the centre of the educational project.

In addition to this task of re-reading earlier scholarship in order to draw out planning processes, a few scholars have also taken up the work of providing critical viewpoints on adult education program planning through the examination of power relations. Cervero and Wilson (2006), most prominently, provide an in-depth analysis of the ways that power dynamics and issues of systemic inequalities of voice and access affect adult education planning activities. This takes the form less of a fully articulated model of program planning and more of an extensive critique through which to engage with current program planning practice. Wilson and Cervero (1997) begin by tracing the influence of technical rational perspectives on the field and continue (2006) by making the point that planning is always a deeply political activity. They stress that the power-play aspects of planning have long been overlooked or only cursorily acknowledged in the planning literature. The authors repeatedly make the point that all traditional planning activities are significantly influenced by who has access to the “planning table.” Feminist voices, which have been quite prominent in other areas of adult education are also beginning to be heard in program planning. For instance, Bracken (2011) provides her own analysis of planning practice in a feminist organization and draws out feminist perspectives relevant to program planning in the earlier works of others.

As Caffarella and Daffron (2013) note, there is also an emerging body of work on pragmatic approaches within adult education. However, further research and models emanating from this approach are required to pose a strong alternative to the embedded technical rational tradition. Cervero and Wilson's (2006) work, while influential, is by their own assessment meant to prompt practitioners to consider issues rather than be applied in a specific sense. Other key works on pragmatic planning, noted by Caffarella and Daffron, come from outside of the adult education field as it is generally understood, originating in urban and policy planning (Forester, 1999, 2009) and social work planning (Netting O'Connor & Fauri, 2008).

In adult education, Sork (2000) offers up what is likely the most fully articulated model of pragmatic program planning. Caffarella and Daffron (2013), however, fail to classify it as such, choosing instead to highlight Sork's (2010) brief discussion of planning as improvisational theatre as his contribution to pragmatic planning scholarship. Sork's (2000) approach is a question posing model in which practitioners are encouraged to move fluidly amongst seven elements key to program planning, posing and answering questions in any or each element, in order to move away from prescriptive linear planning models. The seven elements included by Sork (2000) are: analyze the context and learner community, justify and focus planning, clarify intentions, prepare an instructional plan, prepare an administrative plan, develop a summative evaluation plan, and create a formative evaluation plan. He locates the latter in the centre of the pie shaped pieces that form a circle (Figure 8). This model instructs planners to attend to planning concerns within the technical, socio-political and ethical domains. Sork (2010) himself has noted, however, that more work in this area is necessary for his model to have a significant impact on the field.

Figure 8: Sork (2000). Basic elements of program planning (p. 185)



Within the adult education program planning field, Gboku and Lekoko (2007) provide a model of culturally situated program planning with their 10 pillars of the African perspective, which are intended to be applied to existing planning models in order to allow for situated and contextually responsive planning. Ryu and Cervero (2011), drawing on their interviews with Korean practitioners, also emphasize the importance of culture in planning practice, highlighting the role of Confucian values in their approaches. These works and others like them provide a model for culturally sensitive planning in a range of contexts. This research on the cultural frameworks of planning springs, in part, from critiques of mainstream planning models as not sufficiently connected to their contexts.

While adult education program planning has struggled to move beyond linear models, other disciplines have sought and found new models that hold promise for making program planning more creative and responsive. Rather than trying to prescribe and achieve a known

future state, emergent oriented ontologies focus on observing and facilitating the natural emergence of change as it springs from the connections between agents in complex systems. The study of such change in complex systems is centered in the field of complexity theory and I now move to a discussion of the literature on emergent ontologies, specifically complexity theory and design thinking and their relationship to program planning.

Chapter 4

Presentation of the Literature on Emergent Ontologies

This chapter introduces the literature on emergent planning approaches, in particular concepts associated with complexity theory and design thinking, and explores the implications of these approaches when it comes to planning for adult education. While there are many key concepts within emergent approaches which hold promise in educational planning there are also areas of challenge which must be considered. These areas of challenge will be addressed in the closing of this chapter.

Complexity Theory as a Basis for Planning

Understandings of complexity spring from complexity science which has been informed by biology, computer science, mathematics, and physics. Biologist Kauffman (1989, 1993) and computer scientist Holland (1996) define *complex adaptive systems* (CAS), the study of which is central to complexity theory, as systems driven by the actions of the individual elements within them. They suggest that these actions, sometimes predictable but often not, are governed by multiple overlapping and sometimes contradictory mechanisms, including recursive feedback among components that allows them to act reciprocally upon one another in nonlinear, dynamic webs of interactions. Research in biology and physics suggests that the self-organizing nature of living systems is not only self-perpetuating but *autopoietic* (self-creating) (Maturana & Varela, 1980; Prigogine & Stengers, 1985). Kauffman (1989) asserts that, as such complex systems achieve *autocatalysis* (self-generated change), emergent features result. *Emergence*, a concept key to complexity theory, holds that as systems adapt and transform the resultant states are not predictable or fully explainable by the sum of the system's parts (Waldrop, 1992). Self-organized systems, systems without central control mechanisms, evolve and change, sometimes in sudden

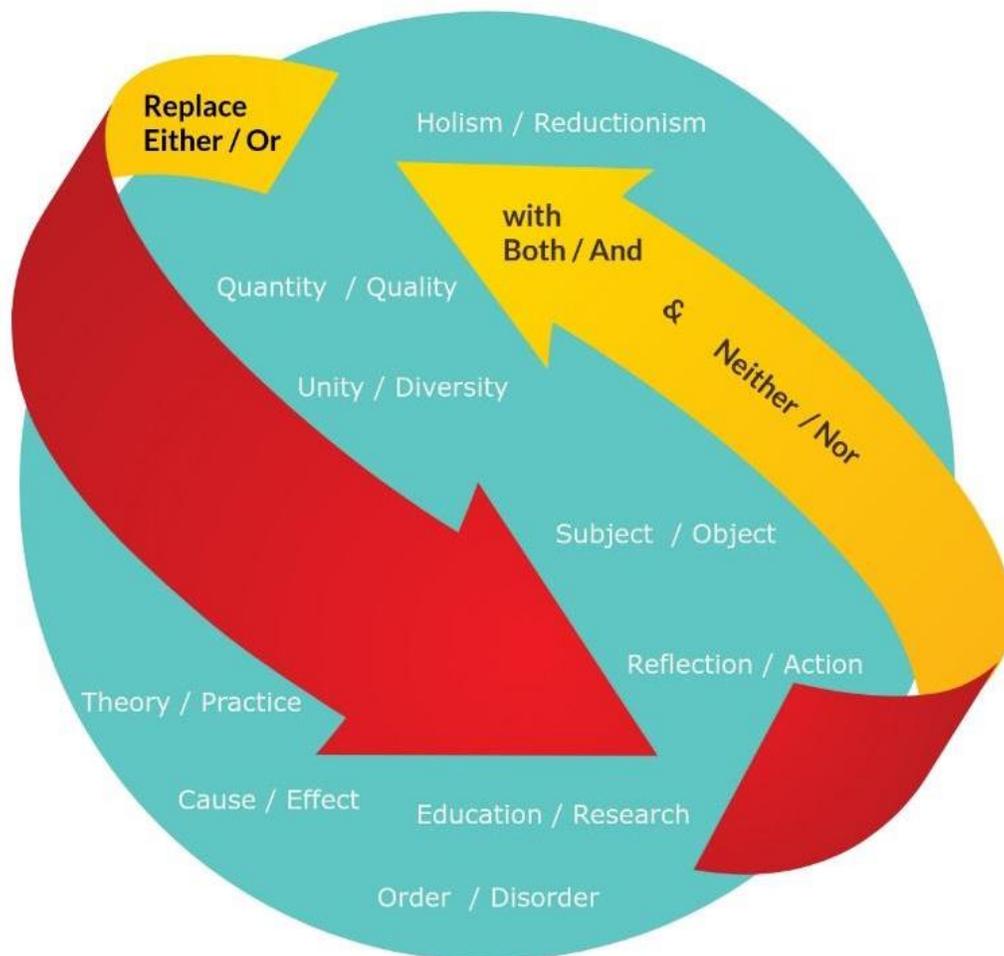
and innovative ways, resulting in dynamic new states which are far from equilibrium. Self-organizing systems continually exchange energy and matter with the environment but still remain relatively steady (Prigogine & Stengers, 1985). Complex systems are loosely bounded, that is they interact with their environment while maintaining coherence as a separate unit. Consequently, it can be difficult to define where a complex system begins and ends.

Complexity theory has been described as a new perspective that stands in contrast with traditional atomistic and reductionist approaches to scientific inquiry such as the Newtonian view (Capra & Luisi, 2015). Part of the originality of an emergent perspective springs from the nature of complex phenomena. Unlike linear phenomena interrogated in traditional Euclidian geometry, many natural structures are comprised of complex forms which can be identified as *fractals* (Davis, 2005). Ferns, the spiral of the galaxy, and lightning are all examples of fractals. Fractals are defined by their repeating patterns that are self-similar and scale independent, that is, they do not become simpler or more complex as you examine them more or less closely; rather, small portions often closely resemble the whole. This is due to their recursive nature in which simple geometric rules are iteratively applied, each one to the result of the last creating further and further complexity (Capra & Luisi, 2015). Such examples of emergent complex phenomena have prompted scientific researchers to embrace the uniqueness and unpredictability of some natural phenomena and reject reductionist perspectives that seek totalizing rules.

Complexity theory as applied to social systems and human organizations provides insights that go well beyond the realm of science. Morin (2008), for example, makes a convincing argument that our current reliance on simple thought (both because of anti-intellectualism and the twisted simplification occurring in academia through doctrinism, dogmatism, and rationalism) is ultimately destructive and obscures our understanding of social

and historical phenomenon. Instead, Morin (2008) proposes three principles of complexity. First, he posits the dialogic principle, the bringing together of terms or concepts that are both antagonistic and complementary in order to hold their duality and their unity. This principle is informed by recognition of the duality of order and disorder in complex open systems that allows them to work together and create organization. Morin's (2008) remaining two principles, organizational recurrence and the holographic principle, stress the relationship of parts to the whole, recursive cycles of generativity between the two, suggesting that each is present within the other (Figure 9).

Figure 9: Mayoh-Bauché, 2018. A complex take on holding together dichotomous concepts



Morin (2008) both clarifies the implications of scientific research on complexity in physics and biology and expands the application of the subject with his soaring philosophical ontology of complexity. Morin (2008) posits that the uncertainty inherent in complexity is key to our current understandings of science and the world and that it can be a fruitful source of creativity and generativity (Montuori, 2008). Morin (2008) asserts that “an indubitable, inescapable imprecision must be accepted, not only in phenomena, but also in concepts” (p. 21) and stresses the need for meta-perspectives in which the observer-conceiver is integrated into her own conceptions.

Key concepts in complexity theory. Adult education theorists have both applied and expanded upon concepts found in complexity theory. This section will treat concepts within complexity theory in more depth, especially in regards to their application in adult education.

Complex adaptive systems. The concept of complex adaptive systems, introduced above, stresses the non-linear, reciprocal quality of dynamic systems. Complex systems are made up of various distinct elements connected in a network of relationships. Through these connections, information and feedback circulate in a manner that allows systems to learn and adapt. Complex adaptive systems, then, are more than just the sum of their parts. Fenwick and Edwards (2013) provide insight to how educational systems also function in a nuanced, adaptive way. They describe fluctuating interactions between people and other aspects of educational systems including objects and technologies and conclude that “[n]o clear lines of causation can be traced from these interactions to their outcomes, because at any given time among all these interconnections, possibilities are contained in the system that are not visible or realized” (p. 55).

Connection. Another key feature of complex adaptive systems is the fact that they are rich in connections, a vital prerequisite for effective self-organization, adaptation and ultimately

emergence (Stacey, 1996). Davis and Sumara (2006), who work in the area of curriculum design, point to the importance of neighbour interactions within educational systems. They contrast centrally controlled systems with decentralized networks that are more robust as they are better able to adapt. Adaptation requires connection among both diverse and redundant elements. Consequently, Davis and Sumara (2006) suggest that educational institutions may benefit from decreasing centralized control, supporting mechanisms for connection between agents within the system instead.

Self-organization and emergence. As mentioned above, emergence refers to the reality that complex systems are not reducible to the sum of their parts. Rather, as elements of systems interact, novel qualities emerge which make the overall system different from the collection of elements within it. Global realities, then, are created through the convergence of small local interactions. Emergent properties, however, are not predictable based solely on knowledge of the elements within a system (Capra & Luisi, 2015). Within adult education, scholars have also been concerned with emergent behaviour and have offered suggestions regarding how to promote emergence in educational systems. Fenwick and Edwards (2013), for instance, argue that the varied, unpredictable interactions inherent in learning systems result in knowledge that is emergent. Davis and Sumara (2006) also list and unpack conditions of emergence, including internal diversity, internal redundancy, neighbour interactions, distributed control, randomness, and coherence. In contrast, Byrne (2014) attempts to identify educational activities that promote emergence, including practices such as problem-based learning, interactive group learning, and interdisciplinarity.

Disruption. One realization arising from the study of complex adaptive systems is that self-organization and adaptation do not occur when systems are at or near equilibrium. Rather, a

certain level of disruption is required within the system to prompt change. Waldrop (1992) describes this zone of fecundity as being on the “edge of chaos” (p. 1). White and Levin (2016) explore the deliberate use of purposeful perturbations in educational planning in order to create disruptions sufficient to prompt emergent change. Complex adaptive systems do not change at a consistent pace. Rather, as they stray towards the edge of chaos, they reach bifurcation or tipping points at which point significant change (self-organization or dissipation) may suddenly occur. Educators must be aware of the importance of this in educational change as we can have a tendency to misinterpret a minor influence that acts as a tipping point as an important causal factor due merely to its close proximity to major change. Understanding the “straw that broke the camel’s back” nature of system disruption allows educators to more effectively utilize disruption and disequilibrium in their work.

Attractors. Even in the face of disruption that is driving towards the edge of chaos, complex systems do not generally collapse into the chaotic. Rather the effect of attractors within a system pull it towards certain patterns of behaviour. Attractors are states that a system is drawn to over time. As Blackman (2012) explains, “[w]hat future attractor comes about depends on the system’s initial conditions and then what causal combinations occur as a result of a change” (p. 337). In social systems, many different influences contribute to attractor states, with some being particularly influential. For example, the culture of an educational system or institution can act as a powerful attractor towards certain patterns of behavior and action (Kerschner & McQuillan, 2016).

Transdisciplinarity. Complexity posits intersubjectivity in which the fluid, reciprocal interaction of subject, object, and environment broadly conceptualized forms the space of study. This perspective offers adult education scholars an opportunity to move away from dichotomous

ways of perceiving learning as a primarily human or cognitive undertaking and instead embrace the multiplicity of elements and processes involved in learning. One topic on which many researchers converge in their critique is the reality of firmly divided disciplinary silos in academia as well as in the professions. Within complexity theory, Morin (2001) asserts that such division encourages indifference and prevents the effective resolution of the tangled problems humanity currently faces. Complexity theory scholars, including Morin (2008), Alhadeff-Jones (2012), and Montuori (2008), promote an ethic of transdisciplinarity which “draw[s] on multiple disciplines while actually challenging the disciplinary organization of knowledge, and the reductive/disjunctive way of thinking” (Montuori, p. xxi). Ultimately, a complex approach to research and learning builds connection and relationships and in doing so breaks down barriers.

The role of complexity theory in adult education. Adult education scholarship on workplace / experiential learning is an area that has significantly integrated the kinds of complex understandings sketched above. Fenwick’s (2003) fifth conceptualization of experiential learning, for instance, is an ecological perspective influenced by complexity theory. In other work, Fenwick (2006) also points to the emergence of change within experiential learning activities. She states that the webs of interactions between varying levels of reality “dissolve mind-body, self-other, subject-object dualities and allow a conception of fluidity among bodies – of human beings, objects, knowledge and nature” and argues that “cognition is co-emergent among persons, actions and environments” (p. 42). Fenwick (2006) draws from scholarship on embodied learning in the context of complexity theory (Davis & Sumara, 1997; Davis, Sumara & Luce-Kapler, 2000; Varela, Thompson & Rosch, 1991) and frames workplace learning as a continuous process facilitated by relationships and emergence within workplaces as complex

systems. Furthermore, Fenwick (2006) goes on to propose ways that educators can utilize complexity theory's understanding of system change to promote justice and equality.

One reason that complexity theory is resonant in adult education is its focus on the ability of systems to self-organize and adapt which describes how learning occurs in complex systems and the ends of such learning – transformation. This connects to the significant interest in transformative learning within adult education. Many of the scholars who have taken up complexity approaches within the discipline have done so in relation to transformative learning. In her treatment of experiential learning through complexity theory, for example, Fenwick (2006) argues that the framework of complex adaptive systems is instructive in understanding how transformative learning is self-generated, an approach that has been taken up by other scholars. Lange's (2012, 2015) approach incorporates the influence of complexity theory. Lange (2015) presents this perspective as a challenge to the modernist roots of transformative learning and argues for the necessity of a living web of approaches to understanding the theory. Complementing Lange's (2015) arguments, Alhadeff-Jones (2012) pushes for multi-referential analysis of transformative learning and argues that such an activity in itself may facilitate transformation. Karpiak (2000) states that complexity-informed perspectives provide evidence for the importance of processes of transformation. She points to ways that adult educators can work with learners in zones of discomfort and novelty.

As complexity theory is concerned with a holistic view as opposed to prevailing reductionist approaches to science and scholarship, when applied to education it centrally involves a critique of the epistemological assumptions of current educational practices. Morin (2001) addresses the failures of learning and education due to simplistic thinking and a blindness to the complexity of reality. Morin's (2001) work on education and complexity offers a

promising vision of what education can be if reconceptualised through a new, more complex perspective. Snyder (2013) offers a continued critique of the conceptual understanding of those involved in education, especially planners and administrators, by asserting that in education complex problems are often treated as if they can be solved in a linear manner, with poor results. Within education, both Morin (2001) and Snyder suggest, the tendency to reductionism is still strong. Osberg, Biesta, and Cilliers (2008) agree, opposing the current representational epistemology in education with an alternative informed by complexity theory that seeks to promote experience of the real rather than mere understandings of representations of reality.

Some adult education scholars have also taken a broad look at adult education activities through the lens of complexity theory. Tisdell (2011), for instance, uses complex systems and wisdom to consider the state of the field of adult education. She suggests that complexity theory provides a model for adult educators to begin to weave webs of emergence in order to help build true wisdom both within the field and in others connected to it. In an in-depth analysis of complexity informed approaches and their implications for education, Sinnott (2003) treats a wide array of topics including self-directed learning and how understandings of complexity can help instructors shift from structured learning settings to those that are more flexible, self-directed, and relationship focused.

In addition, applied researchers in education have drawn connections between complexity theory and other pertinent philosophical perspectives, especially post-structuralist and post-modern ones. Davis and Sumara (2006) repeatedly connect complexity-informed perspectives with post-structuralist ones, primarily those of Derrida. Heylighen, Cilliers, and Gershenson (2007) agree, arguing that, while complexity theory has not yet been broadly explored in the field of philosophy, it overlaps significantly with postmodern perspectives and they can be

mutually informative. Heylighen et al. (2007) also stress Derrida's concept of deconstructionism as relevant to understanding the organizing structures of complex systems and point to treatments of the works of Lyotard, and Deleuze and Guattari from complexity theory perspectives. Olssen (2006, 2008) also makes a cogent argument that Foucault's work and complexity theory share an ontological perspective of reality as fluid, interconnected, and open as well as sharing more particular concepts. Last, complexity theory shares conceptualizations with pragmatism, central to the progressivist view of education. Semetsky (2012) draws parallels between pragmatism and complexity theory's view of reality as emerging in a self-organizing, self-sustaining manner. Complexity theory, therefore, can be connected, not only to other philosophical viewpoints, but also to other areas of adult education practice with a strong focus on emergence. Some of these practices are characterized by the increasing use of design thinking.

Design Thinking as a Basis for Planning

Theory and practice arising from traditional design fields and encapsulated in the concept of design thinking have particular significance for complex systems. The dialogic approach and stress on emergent change within design thinking make it very relevant to the work of planning in a complexity informed manner. Design is a systems-theory informed discipline and therefore shares some of the broad philosophical underpinnings of complexity theory. And, as some educational scholars have pointed out (Mehan, 2008; White & Levin, 2016), design strategies are consistent with complexity theory. I will therefore turn to design thinking in order to garner insights from a discipline that consistently puts emergent strategies for planning into practice.

Models of design thinking emerge from the work of design theorists, building on Schön's (1982) insights. Schön describes the processes used by designers in action and differentiates

them from other forms of problem solving, particularly those employed in the sciences and humanities. Cross (1990, 2011), for example, articulates the core values and “ways of knowing” of design as a third discipline, including: producing novel unexpected solutions, tolerating uncertainty, working with incomplete information, applying imagination and constructive forethought to practical problems, and using drawings and other modelling media as a means of problem solving.

Lawson (2006) highlights the creative and productive features of design, and outlines particular approaches and heuristics designers apply, asserting that design thinking is too complex and variable to be expressed in a single diagram. Instead, he presents a model in which particular design skills are expressed through the core activities of formulating, representing, moving, bringing problems and solutions together, evaluating, and reflecting. Nelson and Stolterman (2012) similarly take a broad approach, formulating a philosophy of design valued for its engagement in analog reality and empowering perspective of intentional change. A deliberate design culture, they assert, is based on service and inclusiveness and requires a systems informed approach that involves understanding and strategically applying varying ontological and epistemological perspectives towards practical ends.

Responding to Cross (2011) and others who urged further theoretical expression of the established structures of design, Dalsgaard (2014) summarizes the key dimensions of design and notes the following key features: theory-practice and reflection-action are intertwined in design, design is characterized by emergence and interaction, design is situated and systemic, design is experimental, design is an interventionist and transformative discipline, designers employ tools and techniques which are essential to their work (p. 45). CEO of the influential design firm IDEO, Brown (2009), describes his conceptualization of design thinking as a process that can be

coherently expressed and applied to a variety of circumstances. The Stanford University d.school and IDEO have been concerned with promoting design thinking as an effective approach to education and some educators and educational planners have begun to integrate design thinking into their practice, including those with a relationship to adult education.

According to IDEO's materials for educators, a design thinking mindset is human-centered, collaborative, optimistic, and experimental and follows a five-phase process of discovery, interpretation, ideation, experimentation, and evaluation (IDEO, 2012). Stanford University's design school, known as the Stanford d.school, presents a similarly process-oriented model composed of five steps which include empathize, define, ideate, prototype, and test (Stanford University Institute of Design, 2016). Although Nelson and Stolterman (2012) critique occurrences of design thinking being sold as a rule-based algorithm, the IDEO and d.school conceptualizations (while losing some of the nuance of the scholarship addressed above) identify many of the same activities and concepts as being key.

Key concepts in design thinking. I will now define some key aspects of design thinking with relevance to planning and the relationship of these concepts to learning and adult education.

Abduction. Abduction is the logical process through which design thinking occurs. It can be thought of in opposition to deduction (top-down logic) and induction (bottom-up logic). Abduction is a process through which both the thing and the method required to result in value are created in parallel (Dorst, 2010). For example, in design situations, designers know the value they wish to achieve but are initially unsure of both the end result and the method which will be used to get there. Abduction arises from uncertainty and involves a playful, imaginative back and forth of conceiving the problem and the solution (Doll, 2012) and abductive thought moves

fluidly up and down, horizontally and skipping from place to place. Scholars, including Peirce (1931), the founder of pragmatism, have stressed the importance of abduction in learning.

Framing. Recognizing that there is no way to fully comprehend all of the factors relevant to a given situation, experienced design thinkers necessarily question and find ways to dynamically create and recreate boundaries around the problem they are faced with (Dorst, 2010). While Buchanan (1992) refers to this heuristic as placement, many design scholars speak of “framing” the design problem (Dorst, 2010; Lawson, 2006; Schön, 1982). Framing may be imagined as examining a problem through a picture frame that you are holding. The best solutions are likely to be found when you move the frame around to consider the problem from different perspectives and respond to varying information. However, if you take the frame away entirely it becomes impossible to address the problem because you now have an infinite amount of contextual information. Framing feeds abductive logic as it temporarily bounds dynamic contextual realities in varying ways which provides insight into the design situation.

Prototyping and serious play. Design research such as that of Cross (2007) and Pasmore (as cited in Rauth, Köppen, Jobst, & Meinel, 2010) suggests that situations that are non-routine, uncertain, and in which knowledge is incomplete are most likely to prompt creativity. One way in which designers routinely promote uncertainty and creativity is through the playful creation of prototypes (Cross, 2011; Lawson, 2006). Prototyping can take many forms, but generally involves the creation of quick low-resolution models of the intended design-end products. Sketching, building with Legos or other small construction materials, and modeling with clay are all common ways of creating prototypes. Prototypes of services may be created in the form of role plays and storyboards or through the use of digital technologies which allow for their creation. Prototypes are designed to be discarded or be remade in order to provide opportunities

to play with and test ideas in an environment where there is a high tolerance for failure. This reversibility and the playfulness it enables is vital. Considine (2012) argues that serious play – playful processes with significant ends, foregrounded in design theory – should be central to the planning process. Brown (2009) also argues that creativity is precluded in situations where there is no appreciation for the power of serious play.

Iteration and experimentation. Prototyping and serious play relate directly to the concept of iteration central to design thinking. Creating progressively more elaborate prototypes of an end-product allows designers to adjust and adapt their creations as they create and recreate them. This is central to design as a discipline. Amongst popular and theoretical treatments of design thinking one of the central elements consistently identified is iteration (Brown, 2009; Cross, 2007, 2011; Dalsgaard, 2014; Nelson and Stolterman, 2012). Iterative design processes are sensitive to feedback and change throughout the process. Snyder (2013) links this responsive quality of iterative planning processes with sensitivity to feedback within complex systems.

The role of design thinking in adult education. An understanding of learning activities and systems as the result of design permeates design theory literature. Buchanan (1992) asserts that the planning of learning is in itself a design activity, one which he classifies as falling within the fourth area of design, “the design of complex systems or environments for living, working, playing, and learning” (p. 10). Banathy (1991) argues for a transformational approach to education planning and change, one based on a model of spiraling processes that loop back upon each other in an interconnected manner, springing from a deep understanding of the societal and systemic context. He outlines framing processes by which designers may define the scope and focus of inquiry, suggesting that the focus of inquiry in educational design can be the “institutional, administrative, instructional, or learning-experience-level” (p. 85). He suggests

ways that the entire societal system might be designed with a focus on the learning-experience level. Nelson and Stolterman (2012) state that whenever education systems “are created or modified, a design approach is used” (p. 21) and that it is imperative that educational planners be aware of which design approach one is adopting and its underlying assumptions. Brown (2009) argues that, “Perhaps the most important opportunity for long-term impact [of design thinking] is through education” and provides examples of its use as an education planning and instructional tool. Brown (IDEO, 2012) also promotes his popular approaches to design thinking explicitly for educational use.

While the design discipline broadly acknowledges educational endeavours as design activities, adult education as a discipline has taken very limited notice of design theory or design thinking. Where design thinking is treated in relation to adult learning, it tends to be in areas with a more tenuous relationship to the field such as higher education, management and business education, and design education. Chance (2010) presents design thinking as an approach to planning in higher education, preferable to the traditional linear models, an approach which more accurately reflects our emerging understanding of reality and is more responsive and appropriate to the complexities of the field. She states that “developing and refining together both the formulation of a problem and ideas for a solution, with constant iteration of analysis, synthesis, and evaluation processes between the two notational design ‘spaces’-- problem space and solution space” (p. 44) is appropriate for educational planning. Chance also observes that, in education, the outcomes of planned change are often not monitored or understood and so suggests that the cyclical, iterative approach utilized in design could address this issue. In another higher education example, this time within a faculty of education, Crichton (2013) presents the Innovative Learning Centres at the University of British Columbia and a partner

institution in Tanzania as examples of learning spaces for educators founded on design and pragmatist principles with the promise to address complex problems. Crichton (2013) argues that collaboration of diverse groups, creative thinking, and new conceptualization of pedagogy are necessary to meet the needs of twenty-first century learners and that design thinking holds promise in this regard. She suggests that design thinking as a scalable practice, rather than a policy or reform idea, is relevant to educators and presents minimal barriers to positive change.

While design education may seem to have a distinct and privileged relationship to design thinking, many connections to broader educational concerns can be drawn. Chance (2010) convincingly argues that design studios provide an example of planning relevant to other disciplines, an example that is different from more typical hierarchical or bureaucratic approaches and notes that a studio format has been recommended by an American national commission on the future of undergraduate education (Boyer Commission, 1998). There have also been explorations of how design students can be taught to utilize design thinking in order to address the multi-dimensional, complex issues of today's world and how others can use design to address complex issues (Cassim, 2013; Rauth, et al., 2010). Institutions such as the Stanford d.school function as interdisciplinary institutes in which students and collaborators from all disciplines utilize a design approach to address challenges within their own field (Stanford University Institute of Design, 2016). In Canada, the University of British Columbia's Innovative Learning Centre is an example of the design studio approach being utilized by educators (Crichton, 2013). As well, business faculties have taken up the design studio approach with promising results.

The application of design thinking as both a course planning and instructional approach within business schools internationally provides insights into its promise as a planning tool.

Donar (2011) reports on the University of Toronto's design thinking approach which involves "generating ideas from deep user understanding, applying abductive thinking to those ideas while experimenting, multiple prototyping, and constantly modifying" (p. 91). Zupan et al. (2014) assert that design thinking helps to overcome problems associated with traditional analytic course design because design thinking is empathetic, collaborative, and iterative. Zupan et al. conclude that key mindsets developed by planner / instructors taking a design approach are:

- (1) treating a course as an ever-evolving prototype, (2) empathizing extensively, (3) rapidly responding to different impulses from students and consequently altering the prototype, and (4) changing the role of faculty members to not just deliver content but also to offer active support to student teams (Zupan et al, 2014, p. 472).

Their work, which features a design thinking process in which planning, instruction, and learning happen in an iterative loop, demonstrates the potential of design thinking at all levels of education and planning.

Bruton's (2010) analysis of the design studio approach in entrepreneurship education connects with that of Zupan et al. (2014) and suggests collaborative learning and collaborative knowledge creation are results of the design approach. Welsh and Delher (2012), in their study of management education, draw connections between a design thinking approach and critical pedagogy in that both can promote the decentralization of power and a critical awareness aimed at collective, emancipatory ends. They suggest that through design thinking processes multidisciplinary approaches transform into transdisciplinarity that transcends disciplines and actually breaks down disciplinary boundaries. Given the relevance of collaborative approaches and critical pedagogies to adult education, it is striking that design practices, which have had positive results in these areas, have not been more fully explored within the field.

The limited application of design thinking to adult education makes design thinking applications within other areas of education valuable as a scholarly resource. The effectiveness

of design thinking as an instructional approach is explored by Scheer et al. (2012) who suggest design thinking is effective in developing holistic, constructivist learning. In the realm of instructional design, Li (2008), echoing Welsh and Delher (2012), makes a case for the emancipatory potential of design thinking. Li explores the potential of design-informed approaches to empower instructors and learners to collectively discover what work best in their particular context.

While not explicitly located within the realm of education, another area with relevance to adult education program planning where the implications of design thinking are treated is policy planning. Considine (2012) explicates the promise of a design approach to enrich policy planning by contributing to the understanding of how the individual skill sets of each planner contribute to the process. He presses for consideration of the important role of creativity, emotions, and serious play in the planning process. Owen (2005) argues that design thinking offers an approach distinct from scientific thinking which can enrich policy planning when addressing complex problems through increased creativity.

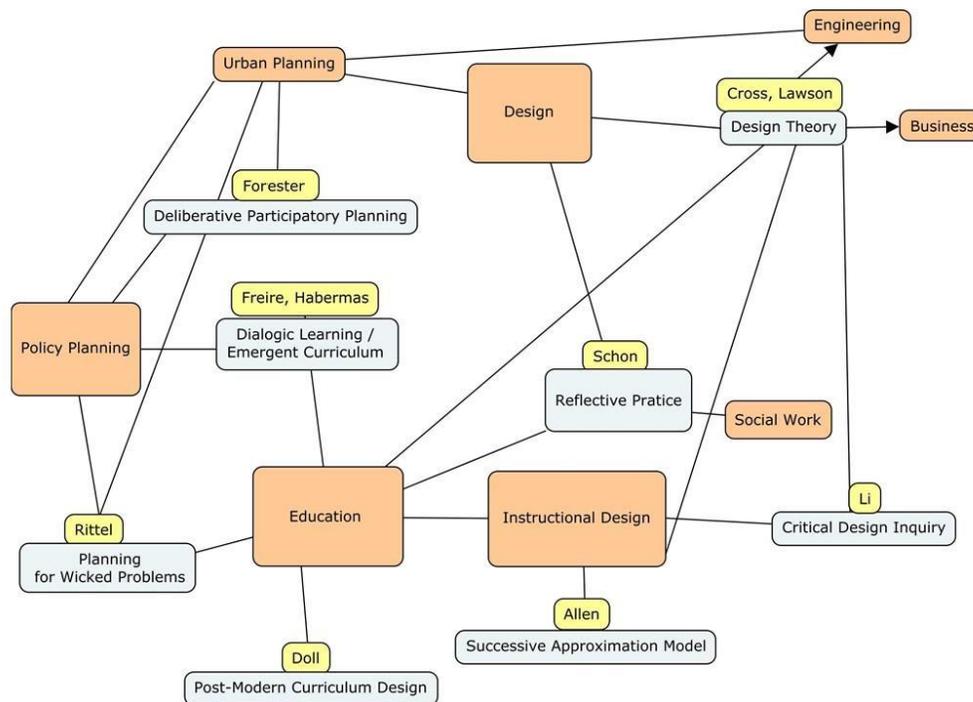
Themes in the Emergent Program Planning Literature

The ethic of transdisciplinarity central to design thinking and complexity theory suggests that the insights found in these two disciplines in their application in varying fields may fruitfully inform adult education program planning. In this section, I explore how these transdisciplinary perspectives apply to adult education program planning.

Sork (2010) has critiqued adult education program planning as not being sufficiently informed by new thinking regarding planning that occurs in other relevant disciplines. While adult education program planning scholars sometimes reference planning models that originate outside of the field (Caffarella & Daffron, 2013, Sork, 2010), there is little consistency in terms

of which external models are referenced and when they are considered. In order to address Sork's (2010) concern, Figure 6 lays out approaches to planning from various disciplines which attempt to move beyond linear planning towards responsive, interactive ones.

Figure 6: Mayoh-Bauche, 2018. Map of planning approaches (repeated)



While the scope of this study does not allow for a thorough exploration all approaches to planning, Figure 6 served as a starting point in my multi-referential analysis of emergent planning theory. I utilized Figure 6 to identify three relevant disciplines – policy planning, instructional design, and education, especially curriculum and reform planning, to explore in addition to adult education. In my transdisciplinary review of non-linear planning approaches, I explored research within these disciplines on planning practices that specifically connects to complexity theory or design thinking. I focused on texts that describe and analyze empirical situations in which complexity-informed approaches were utilized in lived planning processes. This emphasis on empirical studies balances the theoretical focus of much of this thesis and

provide the basis for my upcoming discussion of the implications of complexity approaches on planning practice.

When considering the themes explored below, it is wise to keep in mind the warnings of Williams, Mackness, and Gumtau (2012) that all educational factors, including emergent ones can either inhibit or promote learning depending on the circumstances. As complexity approaches stress, all planning must be responsive to and flow out of the particular system(s) it intends to impact. However, there are some general guidelines that promote positive change which have been applied to complexity-informed planning processes. I will now, therefore, undertake an exploration of some key themes that have emerged from my analysis of the planning literature and accounts of planning practice.

Relationality. Across disciplines, complex planning focuses on building connections between complementary systems at different nested levels of reality which together impact the change process. Planners seek ongoing interaction between those within systems of government, community and social systems, institutional educational systems together with learning and instructional systems at the course level (Barney & Maughan, 2015; Ng, 2014; Sanford, Hopper & Starr, 2015; Walton, 2016). Eppel, Matheson, and Walton (2011) specifically stress the importance of crossing boundaries. They state that:

[w]orking with and across boundaries requires knowledge of how the boundaries that exist have been created and are maintained by social processes...collaborative interagency processes may be required to enable the problem and its solutions to be viewed from multiple perspectives and to sense a way forward (p.52).

Even in planning situations in which interagency relationships are not stressed, educational planning in a complex manner is generally concerned with enabling iterative processes that jointly involve planners, instructors, and learners in creating learning environments, curricula,

and activities. Relationship building is central as new network relationships and interactions must be built and trust established in order to restructure a system, move it away from the status quo and equilibrium, and towards change (Kershner & McQuillan, 2016).

The network organization of connections within a system are especially important within complex planning. Planners recognize that centralised networks may be less adaptive and more vulnerable when compared to their decentralized counterparts (Kershner & McQuillan, 2016). Because of their dispersed nature, and how they are interwoven with other systems, decentralized networks tend to be better connected to a broad base. Therefore, complex planning regularly involves deliberate attempts to move away from centralized control structures within organizations towards a bottom-up approach to development. Snyder (2013), for instance, provides the example of a 2010 educational reform project in Ontario that “did not centrally script and cascade new teaching and learning practices to all classrooms. Instead, it focused on cultivating school-led innovation and improvement” (Mourshed, Chijiokie, & Barber, 2010, p. 19). White and Levin (2016) stress that similar practices in education planning make learners, who should be at the centre of the educational project, active participants rather than passive recipients of a top down approach. Within the realm of instructional design, a bottom-up approach to planning which provides learners with a rich diversity of materials and uses diverse approaches for engaging them allows patterns to emerge through learner choice (Doll, 2012; Irlbeck, Kays, Jones, & Sims, 2007).

Complex planning processes, however, are not concerned simply with connecting nodes within a system by any means possible. While weak links can play an important role in system change, rich, reciprocal relationships amongst agents are also required to allow for mutually informed co-emergence. Therefore, while centralized planners have a reduced role in complex

planning processes, Snyder (2013) stresses that one of their central tasks is working to make the system open and safe for feedback and to promote the flow of feedback within the system as a whole. Ultimately, all of those involved with planning and implementing an endeavor should consider the relationships they establish and the collective growth of the group as central to the process. In learning systems this means that learners and instructors should hold the growth and learning of the group as a primary objective in recognition that ideas and knowledge cannot emerge independently of relationship (Sanford et al., 2015). Ultimately, the role of the planner in complexity approaches “is to facilitate a process that gives rise to a coherent, self-reinforcing web of reactions that move the overall system in the desired direction” (Eppel et al., 2011, p. 53) through strong interpersonal connections amongst agents within the system.

Disruption. In my review of the complex planning literature, one of the most consistent themes was the use of disruption as a method for occasioning change. Disruptions in the way that systems function push the systems away from equilibrium and towards a zone that will allow for emergence. Disequilibrium can be prompted both by turbulence from the system’s broader environment or by perturbations within the system (Kershner & McQuillan, 2016). While environmental disruption is likely outside of the influence of the planner, internal perturbations may be deliberately prompted in order to promote planned change.

White and Levin (2016) explore the use of purposeful perturbations in occasioning emergent change. They provide an example of an educational program they designed and implemented with the intent of changing staff opinions about the potential of disadvantaged students and assisting more of these students in achieving college-preparatory high school credit. While their interventions aimed primarily at increasing student success, some interventions were intended as perturbations for restructuring the communication dynamics within the school and

challenging low expectations of students. The disruptive elements caused unrest within the school system culminating in a tipping point when existing staff aired their aggravation about the new program to the researchers. Because some of the perturbations had been designed expressly for the purpose of breaking down resistance by demonstrating the possibility for change, staff ultimately agreed to work with the new program rather than to file a grievance as they had been considering. White and Levin's (2016) case study provides an example, therefore, of how small programming changes and pilot projects can introduce elements of disruption into a larger system and deliberately create dissipative change and influence new attractor states by shifting institutional culture.

Disequilibrium in a system may be introduced by promoting elements within a system that are likely to be disruptive in unforeseen ways. Increased connections amongst diverse elements and transdisciplinarity within systems provide a rich source of perturbations. Therefore, increasing diversity within a system can be important when it comes to disrupting the status quo. Murphy (2011) explores how collaborative educational planning processes naturally result in disruption as the visions of various members of the planning team are naturally incongruent. As planners work through a back and forth planning process, they continually disrupt each other's personal visions and prompt new unforeseen aspects to be added to the plan. McMillan and Carlisle (2007) state that fundamental shifts in operational structures can also push systems away from equilibrium, suggesting that structural reorganization can prompt disequilibrium and emergent change. Whatever method of disruption is applied, planners need to be aware of the discomfort and system stress that can result in a move away from equilibrium.

Creativity. In the application of complexity theory to planning, creativity is often stressed as a central element (Murphy, 2011; Ng, 2014; Zupan et al., 2014). Creative approaches

are utilized to occasion disruption and open up previously unseen opportunities. Conversely, the uncertainty caused by disequilibrium can also promote creativity. Design research such as that of Cross (2007) and Pasmore (as cited in Rauth et al, 2010) suggests that situations that are non-routine, uncertain, and in which knowledge is incomplete are most likely to prompt creativity. Instructional designer Li (2008) agrees, arguing that a liminal state is important to creative planning. A complex planning process can therefore become a virtuous recursive feedback loop – disturbing system equilibrium through creative interventions with the resulting uncertain state increasing the creativity of agents within the system and the system as a whole.

Creative approaches utilized in planning vary. Some scholars, basing their work upon the research of Csikszentmihalyi (1996), focus on building a creative outlook (Li, 2008). Design scholars, including those treating the design of educational systems, consistently identify creativity as being at the heart of design undertakings and explicate the traits and practices that make up a creative attitude (Banathy, 1996; Lawson, 2006; Owen, 2005). The use of metaphor (Davis & Sumara, 2006; Yorks & Nicolaides, 2013) and paradox (Ng, 2014; Yorks & Nicolaides, 2013) can prompt creative consideration of planning problems. Tangible creative tasks such as sketching, modelling, and improvisational role playing can be instrumental in design-informed, creative planning processes (Chance, 2010; Crichton, 2013). Considine (2012) points to the importance of serious play in planning processes and argues that improvisational approaches and playful interaction result in more nuanced and skillful planning, similar to intuitive approaches utilized by experienced practitioners. The stress on transdisciplinarity and attention to all aspects of context within design and complexity theory highlight the importance of the aesthetic in planning. Because of the vital role of interconnection, all aspects of

environment, including physical environments and their aesthetic qualities, are important when considering human systems.

Recursion / iteration. Both complexity theory and design thinking promote an experimental, iterative approach to planning, possibly related to their joint understanding of knowledge, like other forms of reality, as emerging through lived experience (Bickman, 2000; Snyder, 2013). Both disciplines recognize the importance of uncertainty and flexibility in creating change. In response to such uncertainty, experimental approaches are recommended. The focus on iteration within complexity theory and design thinking connects to movements within education such as double loop learning (Argyris, 2002) centred on Schön's concept of reflection in/on action (Bolton, 2010; Schön, 1982). Such iterative approaches to education provide a stepping off point for iterative education planning.

In all fields, complex applied planning consistently involves an iterative approach that collapses planning and implementation processes into a continuous recursive loop. This is reflective of the recursive nature of change through feedback observed in complexity science. Eppel et al. (2011) note that in all three of the complex policy planning processes they analyze, planning was ongoing and did not have a distinct beginning or end. Rather, they assert that the iterative, recursive cycle of design and implementation creates better policies as they are being continually adapted for their time and place. Iterative processes also allow for changes in response to the effects of past events that may have ongoing impact. In educational planning, the same thing holds true. Iterative processes are more agile and allow more space for consideration of learner needs (Barney & Maughan, 2015).

Iterative approaches to planning point to the dialogical relationship of the theory / practice, research / practice, and reflection / action pairings. In fact, experimental approaches to

educational undertakings such as the use of participatory action research are examples of responsive planning for complex circumstances (Barney & Maughan, 2015; Li, 2008; Yorks & Nicolaidis, 2013). Within design disciplines, the same type of recursive process is achieved through prototyping and iteration (Crichton, 2013). In all cases, it is intended to make planning more responsive to its particular circumstances.

Implications of key themes for complexity-informed planning. In reviewing the themes of relationality, disruption, creativity, and recursion in emergent planning it begins to become clear how different processes of emergent change are from the linear, top-down methods favoured in technical rational planning. The disruption central to emergent planning may not only inform adult education program planning scholarship but may actually disrupt it as well. Karpiak's (2000) treatment of complexity theory suggests that emergent perspectives challenge traditional planning:

The various dimensions of planning (budgeting, marketing, administration) are less like the stable circles or linear arrows of planning that point to a final goal, and more like helium balloons, operating in various states of motion and space. In this light, programs may be planned, but still indeterminate; goals may be defined but still alterable; authority may be assumed, yet still shared; processes may be outwardly stable, yet internally in flux. These challenges and stresses, qualities assumed to disrupt traditional planning, are seen to be essential in the [complexity-informed] paradigm. (p. 40)

The ultimate goal of a complex approach to program planning is to allow for emergence throughout the process, including in the realms of teaching and learning. However, challenges to emergent planning must also be considered in order to prepare to effectively apply emergent planning principles to adult education planning practice.

Challenges to Emergent Approaches

Numerous scholars have also identified challenges when it comes to the application of complex perspectives to education and educational planning (Cochran-Smith, Ell, Grudnoff,

Ludlow, Haigh, et al, 2014; Kuhn, 2008; Morrison, 2008). Some critiques of Kuhn, for instance, were outlined earlier in this study. Cochran-Smith et al. (2014) explore three key challenges to complexity as a framework for adult education program planning which were first raised by Morrison (2008). First, as complexity science and complexity theory focus on observing complex phenomenon, they are oriented towards describing the past and the present. Morrison contends that translating descriptions of what is into prescriptions of what should be is inherently problematic. Second, Morrison (2008) asserts that complexity's rejection of linear causality makes it difficult to utilize in an educational context, especially for planning, as practitioners need to predict the effects of their actions in order to choose ones that are effective. However, Cochran-Smith et al. note that the diminished importance of linear causality in complexity theory does not reject the notion of cause and effect and understandings of multiple causalities in complexity may fruitfully inform education.

Third, Morrison (2008) contends that complex approaches describe phenomena in a neutral manner and, as such, lack the attention to notions of power and ethics requisite for educational research. Cochran-Smith et al. (2014) note that this is indeed a serious concern within education as ethical considerations are - or should be - paramount. When complex perspectives are used without consideration of ethical concerns, they are inappropriate for the educational realm. Critiques of design thinking's relationship to education often centre on the influence of fields, such as business, which have been quick to adopt design thinking, but in a form that may not be sufficiently concerned with power and ethics. As Cassim (2013) notes, some of the popularity of design thinking outside of traditional design realms is because it has been promoted by private design firms as a method for increasing profits. Nelson and Stolterman (2012) indicate that practitioners must engage with design thinking as a holistic, pro-social

method end in itself, not as a strategy for economic gain. With these critiques in mind, I will now move cautiously towards applying the literature discussed above to adult education program planning practice.

Summary of the Literature

In this chapter, I explored the underpinnings of complexity theory and design thinking as promising ontological bases for adult education program planning. In my review of literature in Chapters 3 and 4, I sought to establish the contextual bases for an emergent program planning model, drawing on adult education program planning scholarship and interdisciplinary treatments of complexity theory and design thinking as frameworks for emergent planning. In the next chapter, I turn to my applied research questions:

- How can emergent planning approaches provide an answer to calls within the field for more creative, context-responsive, and connected program planning models and what would such a model look like?
- What applied tools or scalable practices might program planners use in their work?

In the next chapter, I apply the theoretical and empirical literature on complexity theory and design thinking to the design of the Spirals Model of Emergent Planning, centred around six key principles of emergent planning. I also identify specific strategies and tools that planners can use when adopting the principles of emergent planning. Last, I discuss a planning vignette which illustrates what the use of more emergent tools might look like in practice.

Chapter 5

Applying the Literature:

The Spirals Model of Emergent Planning

Davis and Sumara (2006) argue that humans are primarily analogical and assert that complexity “presents new associative possibilities, new threads for a more complex weave” (p. 76). The Spirals Model of Emergent Planning presented in this chapter therefore relies on analogies as a way of depicting emergent approaches. I employ metaphors that offer new possibilities for the application of complexity theory and design thinking to program planning. The metaphors that I have chosen spring from the study of complexity and illustrate the principles of emergent planning as an array of naturally occurring, logarithmic spirals.

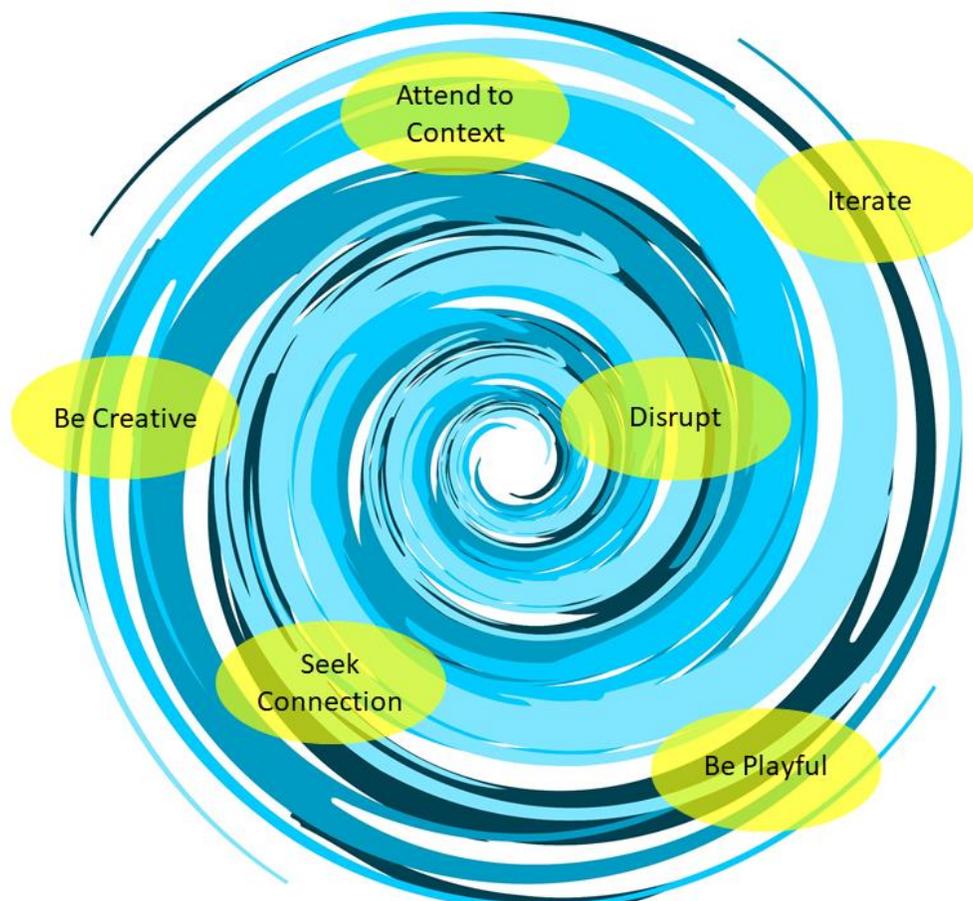
The Spirals Model of Emergent Planning: Principles and Practices

The idea of a spiral as an organizing structure for planning is not original to this study. Spirals have been used both as a decision-making structure for organizational planning (Chance, 2010) and as an approach to thinking in educational practice (Yorks & Nicolaides, 2013). Scholars describing the lived process of educational planners have observed spiraling patterns in which planners return to varying topics and aspects of the process recursively (Riley, 1984; You, 1993). These observations connect to iterative processes in complex adaptive systems (Murphy, 2011). Other scholars including Nelson and Stolterman (2012), Banathy (1991) and Netting et al. (2008) have employed spirals as an organizing element within their planning models. Logarithmic spirals such as those of our galaxy, tropical storms, and seashells are fractals and provide concrete examples of complex systems. Spirals are therefore particularly appropriate as a metaphorical representation of complexity-informed planning.

Complexity-informed planning is always contextual so there can be no set prescription for how planning practice should work. There are, though, key principles when it comes to a complex approach to planning: attend to context, seek connection, disrupt, iterate, be playful, and be creative. These are mapped on the Spirals Model of Emergent Planning (Figure 10) as a reminder that these are not linear steps but principles to be considered and applied recursively throughout the planning process.

There are no clear boundaries between each individual principle in the Spirals Model of Emergent Planning and the others along the spiral; for example, the practices of being playful and being creative are inherently intertwined. I will, however, now discuss each of the individual

Figure 10: Mayoh-Bauche, 2018. The spirals model of emergent planning



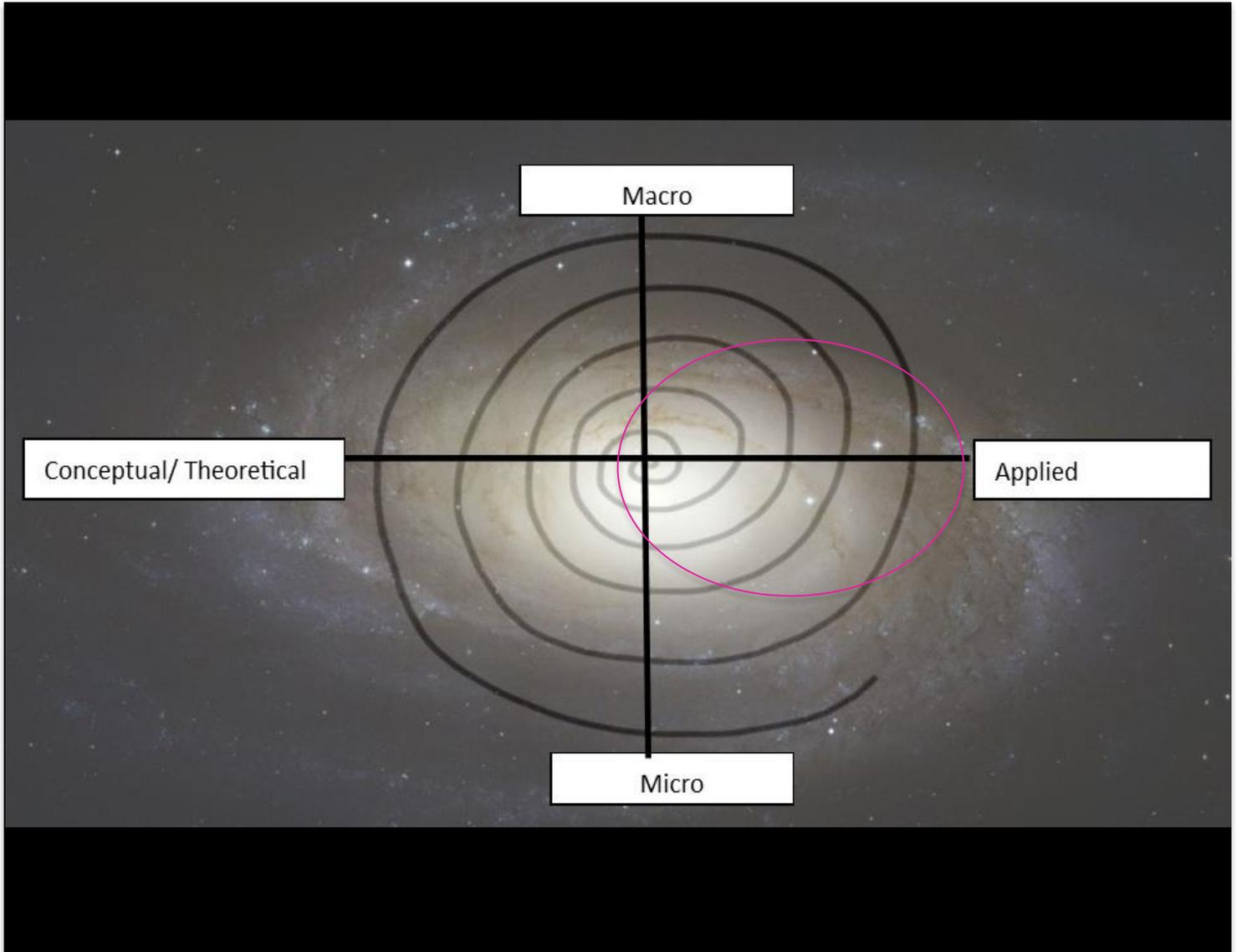
principles in order to offer insight into how each of these principles applies to program planning theory and practice. I will then explore what the application of these principles may look like in an example of emergent planning practice drawn from the planning vignette in Appendix A.

Attend to context: The galaxy spiral. The galaxy spiral draws attention to the varying, nested levels of contextual reality that impact educational programs. The literature suggests that program planning does not sufficiently account for context (Cervero & Wilson, 2006) so an initial step is to become aware of the varying contexts in which our programs function. I have chosen to represent consideration of context using the immense spiral of a galaxy to stress the unboundedness of the contexts planners must consider. Just as physical science researchers must attend to various disciplines and levels of reality, so too in educational planning researchers must consider different contexts at varying levels through a multitude of disciplinary lenses. While frameworks exploring context are not uncommon in education (Davis & Sumara, 2006), they are often bookended by the individual learner and society. Less often are adult educators or educational researchers urged to attend to the micro or macro levels of context. In established systems models of education (for example Bronfenbrenner, 1979) culture is often the most macro level considered.

The galaxy spiral (Figure 11) encourages planners to consider context from the extreme macro end of the spectrum, such as the transpersonal level and the ecological level, the connection between humanity and the biosphere, down to the most micro-levels of DNA and chemical structures. The galaxy spiral conceives of context as existing on a spectrum from applied or physical context, such as the physical environment or physical interactions amongst people, to much more abstract levels of context such as spiritual context or cultural knowledge. In order for planners to consider different relevant levels of context, Appendix B provides a table

which presents numerous examples of levels of context drawn from various scholarship. They are presented arranged from macro levels of reality (at the top of the table) to micro levels (at the bottom). Planners are encouraged to consider these and other areas of context and to map them on the galaxy spiral using their placement to indicate both where they fall on the vertical macro to micro plane as well as on the horizontal plane of conceptual/ theoretical to applied. Figure 18 (discussed later in this chapter) provides an example of the application of the galaxy spiral.

Figure 11: Mayoh-Bauche, 2018. The galaxy spiral



Tools for attending to context. Visually representing context in a fluid rather than linear way can be important and mind-mapping tools can assist in this process. Mind-maps can be low tech, created on whiteboards or paper. Sticky notes and a wall also make a great context mapping tool. Online tools can also be found which help with mind-mapping. Some examples include Coggle, and Imindq. Online tools can enable collaborative mapping for groups who are geographically distributed. The Cmap tool created by the Florida Institute for Human and Machine Cognition (IHMC) provides a rich array of functionality, allowing users to include a variety of media in their maps and to host them online. Agudelp and Salinas (2015) outline a strategy for using Cmap together with learners to achieve flexible program design.

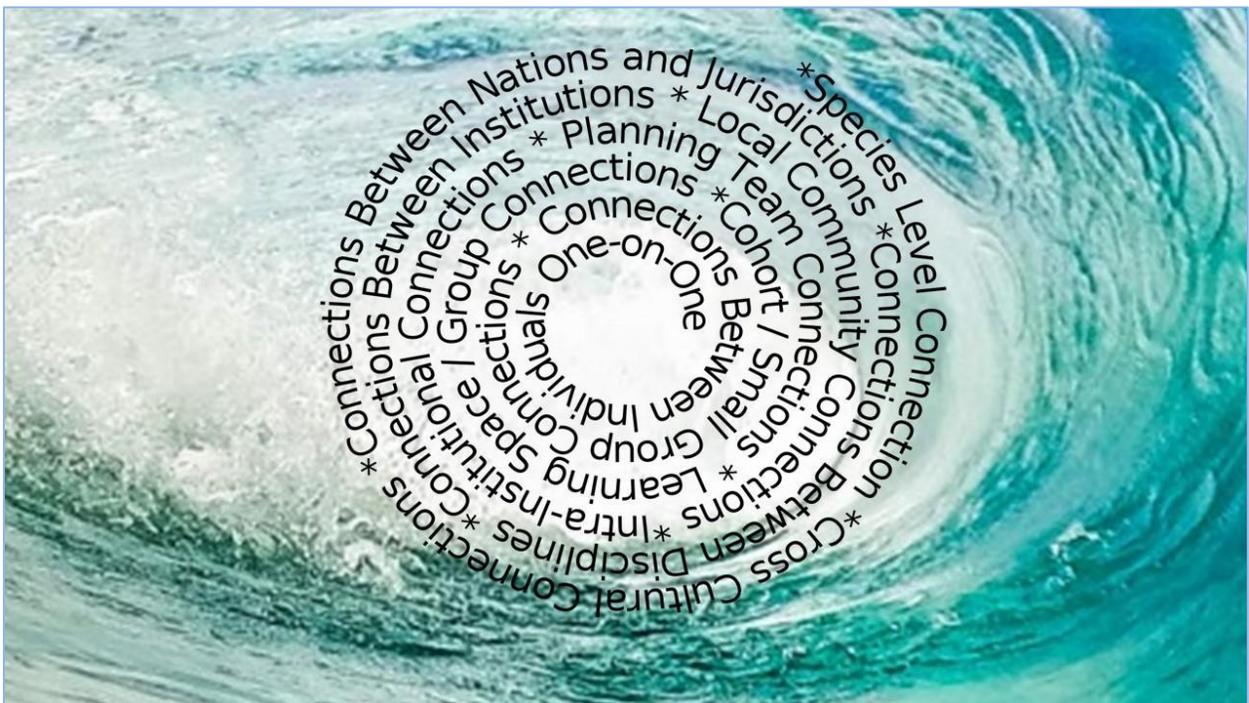
Another tool for connecting to educational context is by extending the learning outside of the walls of the institution. Often in complex approaches to learning, learners participate in projects that have implications in the so called “real world” outside of the learning space. This may be structured as project-based learning in which participants create or do something that has an impact in their larger environment. This can happen in partnership with outside agencies or individuals from the broader community. In fostering connection to learners’ larger contexts, community projects strengthen connections and allow for the flow of feedback between learning system and environment, allowing the learner’s context to impact the process of program formation.

Seek connection: The whirlpool spiral. While the galaxy spiral addresses the contexts for educational planning at all levels, the whirlpool spiral focuses on the central element of connection. The metaphorical spiral I evoke in my discussion of connection is a whirlpool which forms though the constant motion and complex interactions of currents. Connections within systems are fluid and ever changing. Much of the energy and power of social systems, including

learning systems, comes from the interactions between people, objects, technology, and other dynamic elements. As has been mentioned earlier, artificial borders, which limit interactions between people and create silos, such as those in academia, reduce the power of the system and impede change; the powerful flow of the whirlpool of connection works to weaken such borders.

Unlike the other spirals, the whirlpool spiral (Figure 12) is composed of a permeable line. This is to stress the importance of crossing and puncturing boundaries in complex planning. Those involved in the planning process should promote unimpeded interaction at many levels of personal, institutional, and cultural connection. This spiral spans the centre of the Macro-Micro Y axis in the context spiral (marked with a pink oval in Figure 11), encompassing large-scale relationships such as those between governments and those they govern down to personal relationships such as that between an instructor and an individual learner.

Figure 12: Mayoh-Bauche, 2018. The whirlpool spiral



Connection is at the core of the functioning of complex adaptive systems. Situating her perspective in quantum physics' understanding of reality at a subatomic level as a rich, generative network, Lange (2015) identifies relationality as an important emerging concept and argues that relationally situated perspectives help to move beyond dualistic thinking. This idea is shared by other complexity theorists with an interest in education who have identified dichotomous conceptual pairings and explored the way that dialogical processes inherent in complexity can help conceive of these pairings as simultaneities, processes that operate concurrently (Davis & Sumara, 2006; Morin, 2008).

In practice, this suggests that as planners we have a role in strengthening connection at many levels. Planners should work both inside and outside of the planning process to build and strengthen connections with learners, instructors, and other staff as well as stakeholders and community members. While most models of planning focus on needs assessment and even collaborative practice, complexity-informed planning goes even further. It stresses the importance of organizational structures and communication practices that reduce hierarchical organizational control and siloed work groups, ensuring that all members of a learning community have maximal opportunities to interact with and influence each other. As Davis and Sumara (2006) assert, planners can also promote opportunities for ideas, technologies, and approaches to interact and intermingle, noting that nodes within a complex educational system are not necessarily people.

Tools for connection. Two broad strategies for creating connection emerge as trends across multiple planning projects within the emergent planning literature. I would argue that these two approaches exist in complement with the less thoroughly documented, though vital, practice of planners cultivating strong personal relationships with diverse stakeholders,

community members, instructors, and learners. The first strategy, already well documented in the complex planning literature, is collaborative planning in which members of diverse groups are consulted or asked to collaborate on the design of programs (Kershner & McQuillan, 2016; Snyder, 2013). The range of individuals represented in the planning process may include representatives from government, citizen and corporate groups, academic researchers, institutional leaders, subject matter experts, instructors, learners, prospective learners, as well as learners' families and community members. Collaborative policy-making is increasingly being recognized as an effective method of political planning for complex social problems (Innes & Booher, 2010). Adult education planners can increase their proficiency at collaborative planning by accessing policy focused resources on the topic.

The second strategy for increasing connection within complex program planning is the use of small cohort groups which can be created at many points within the process in order to encourage strong give-and-take relationships among diverse individuals (Sanford et al., 2015). Small cohorts may be formed early on in the planning process and may include planners and instructors as well as learners or former participants. Often, cohorts composed of mixed teams of learners and instructional staff can be formed when program instruction commences. Cohorts may undertake learning activities cooperatively as well as provide feedback and direction on program format, materials, and activities. Both collaborative planning processes and cohort based planning are encompassed in Figure 12.

Other tools for seeking and fostering connection include the use of artifacts to prompt interaction; for example, a set of cards with words or pictures that individuals group, arrange, or use to tell a story. Card sorting activities have been used in design, user interface design, health research, and social science research. Within educational planning, for example, White and

Levin (2016) document the use of Artifact Elicited Response Technique to promote interaction in the planning process. Health researcher Colucci (2007) also documents different uses of artifacts, including pile sorting, picture sorting, and the use of "magic tools".

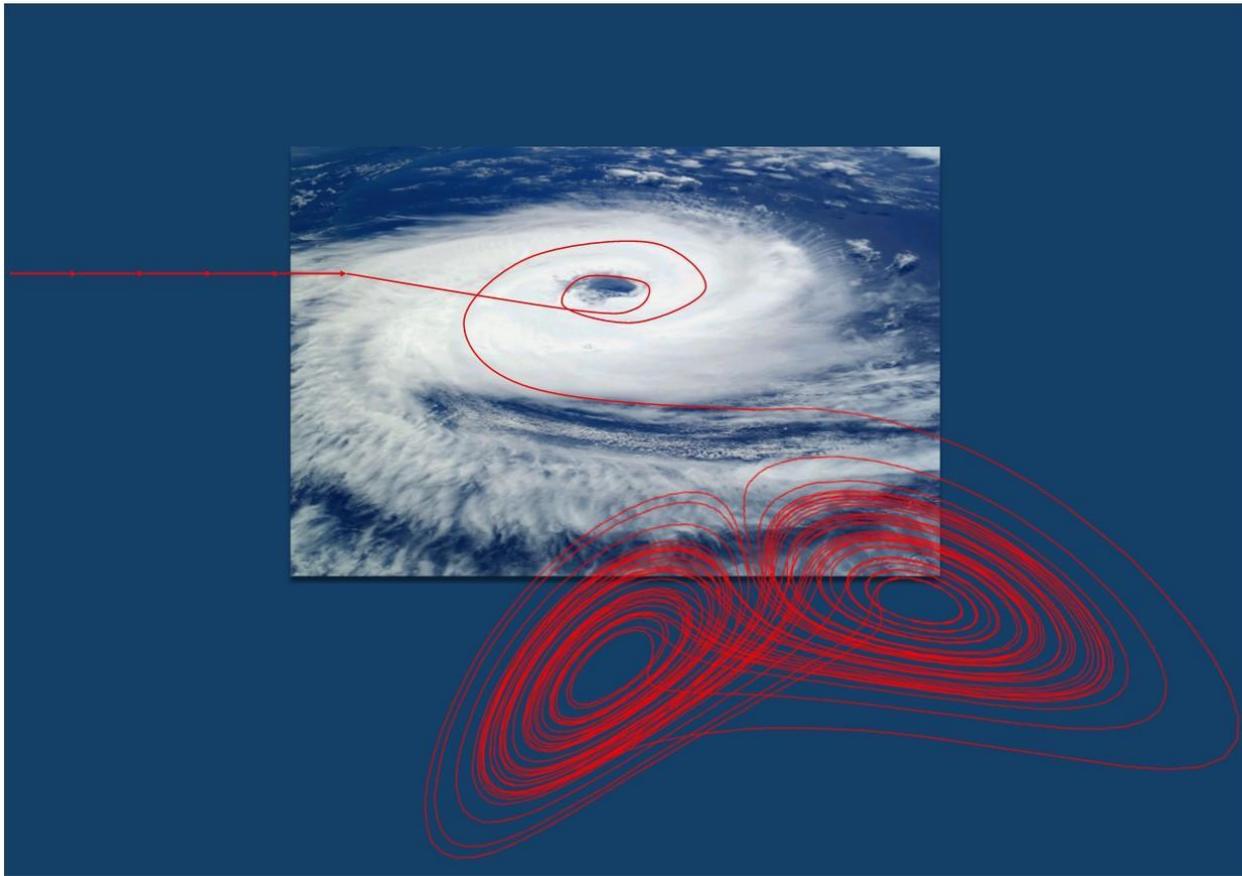
Explicitly discussing and encouraging approaches that privilege the learning of the group over that of the individual can be used to promote relational accountability. When learners are motivated to use their own resources to enrich the learning of others it is more likely that they will contribute to course activities and materials in ways that prompt emergent learning situations and activities. Sanford et al. (2015) explore three principles for Indigenous teaching and learning that prompt consideration of others:

- Put the learning of your peers before your own learning;
- Create work that will benefit seven generations to come;
- Find your passion in the course content and use it to energize the community.

Use of varied strategies to promote large scale connection as well as more local connection within instructor and learner environments can work together to strengthen the overall functioning of the learning system.

Disrupt: The tropical storm spiral. The intermingling of ideas, technologies, and approaches discussed above promises to be effective in occasioning change in complex systems, at least partially through the disruptive influence of diversity in relationships, ideas, and technologies. The spiral I have chosen to represent disruption is a tropical storm (Figure 13). The tropical storm brings contradictory drives together into a powerful, coherent force. The storm of course is destructive; it tears through things, leaving existing structures broken and ineffective in its wake. While we do not want to cause extreme destruction in our planning activities, there are

Figure 13: Mayoh-Bauché, 2018: The tropical storm spiral



times when the only way to move forward towards new ways of doing things is to challenge or fully dismantle current educational structures. Complexity theory reveals the power of attractor states that function to pull practice back into familiar patterns. It is only through the power of disruption that we move beyond these attractor states to a new pattern of behaviour. The tropical storm spiral (Figure 13) shows a linear planned state being transformed into a natural attractor state through the disruptive power of a storm. I have chosen to represent the Lorenz attractor, an actual chaotic attractor state first discovered in meteorology (Stewart, 2000) but also applied in other contexts. This spiral reminds planners that, despite good intentions, we cannot foresee or dictate where change will take us. Rather, if we promote disruptive change, the process may be

challenging, but newly emergent states may serve us better than any we might have deliberately planned.

White and Levin (2016) provide educational planners with two guidelines for the use of perturbations to promote disruption in an educational setting. First, “each perturbation must have a purpose other than just creating instability” (p. 75). Second, “perturbations must be designed with the purpose of breaking down resistance” because “when you push people they will push back” (ibid). Planners should consider strategies designed to both promote learner success and provide perturbations within the current system. In order to be prepared to do this, planners need to explore their own feelings about, and any discomforts with, change. We must acknowledge how we benefit from the status quo arrangement and the uncertainty of our own role in new states occasioned by emergent change. As we overcome our own personal barriers, we should further seek disruption by diverging from the norm and celebrating disagreement (Mansfield, 2003).

But, given the emergent reality of change in complex systems, it is incumbent upon planners to focus our efforts more on identifying and promoting bottom up patterns of disruption than on personally trying to trigger that disruption. There is a popular story (of contested origin) that provides an example of how adult education program planners can function. The story tells of an architect who designed a college campus. He had the buildings built and greenspaces planted but waited a full year to install sidewalks which he then placed where the “desire paths” (those worn in the grass by foot traffic) had formed. Within educational systems, there exist informal practices and patterns of functioning that are not aligned to formal policies but which exist because they serve a purpose for those within the system. By being attuned to these emergent patterns of change, planners can help to disrupt formal institutional practice towards

emergent patterns beneficial to learners. By undertaking actions that increase disruption and build on the momentum of emergent change, planners can sometimes be involved in pushing the system to the point of bifurcation and ultimately enabling the establishment of new attractor states more in line with learner needs.

Tools for disruption. Planners can use different approaches in order to make room for contradiction within the planning process. Iterative planning, which allows for failure, opens up space for contradictions between initial hypothesis and results. Contradictions in opinions between diverse members of planning teams and stakeholder groups involved in truly collaborative planning can be fecund. As White and Levin (2016) demonstrate in the example outlined earlier, pilot projects that function on different assumptions than the larger institution can disrupt educational practice.

Un-parallel processes or the deliberate use of discordant processes within the design team can help to introduce some disruption and produce a fertile ground for emergence in planning. Having different members or groups within the planning team attend to different aspects of the process, different input, or different approaches to planning can add richness to the process. As the group comes together and members challenge each other with their varied takes on the situation, disruption can occur. This strategy is also useful in the instructional setting as the program design continues to evolve (Doll, 2012). Providing groups of learners with an array of options in regards to materials and learning activities ensure that they bring varied perspectives back to the group and enrich the learning of all. The connection of disparate theoretical and personal perspectives can allow for elements of the program to emerge that could not have been predicted or planned in advance.

Iterate: The Romanesco spiral. The unique patterns of Romanesco broccoli, represented in Figure 14, vividly demonstrate the iterative nature of the growth of fractal plants. Romanesco does not emerge as a formed plant that merely grows bigger over time. Rather, the spiraling pattern of the head is composed of smaller heads, each one a collection of spiraling smaller heads made of smaller identical spirals. The plant itself is iterative, it repeats the process of the blossoming spirals over and over again to create the wonder of the fully-grown plant.

Figure 14: Mayoh-Bauche, 2018. The Romanesco spiral



The spiral sketch I have incorporated into Figure 14 is blank and serves to remind planners that, whatever planning process they choose to undertake, it should be approached iteratively with the intention to circle back and revisit past decisions as the system provides feedback. The blank spiral also reminds us to dialogically address seemingly dichotomous

concepts and integrate them in our work. Planners need to move from reflection to action and back again and use the momentum created by this movement to hold the two together without flattening out their contradictory power. The same holds true for theory and practice as well as many of the other dichotomous pairings explored earlier in Figure 9.

The simple depiction of a blank spiral in Figure 14 may be paired with more flexible approaches to the design of educational programs. Sork's (2000) question posing model (Figure 8) is a good example as it represents the most fluid and complex of the adult education program planning models to date. Planners could, for instance, picture or reframe Sork's (2000) planning process as a spiral in order to remind themselves to consistently iterate, to circle throughout the aspects of planning, again and again.

Tools for iteration. Whether one jumps in with a “crash course” from the Stanford d.school (Hasso Plattner Institute of Design at Stanford University, 2017) or explores foundational scholarship on design thinking (Cross, 2007; Lawson, 2006), design thinking provides a dynamic framework for iterative planning. Within various design fields there exist strategies for planning and implementing in an iterative manner. Design approaches to planning in the human services field (Hanington & Martin, 2012), for example, behavioural mapping, parallel prototyping, rapid iterative testing and evaluation, as well as heuristic evaluation can be used across disciplinary boundaries. And, rather than approaching courses with a pre-determined course of action, planners can assist facilitators and learners in developing emergent guides for course learning.

Numerous tools exist which can assist in iterative planning processes. The use of shared access electronic documents (such as through Google Docs) allow groups of learners and / or instructors and planners to collaboratively develop learning plans and resources both from a

distance and over time. The editing functions in many collaborative working platforms allow for continual adaptation of plans in addition to the ability to capture and save the plan as it is at any point in the planning process.

Be playful: The seashell spiral. I have chosen to use the seashell spiral (Figure 15) as a metaphor for playfulness. To illustrate why I made this choice, I turn to the more playful genre of storytelling to paint a picture of beachcombers searching for shells at the edge of the sea.

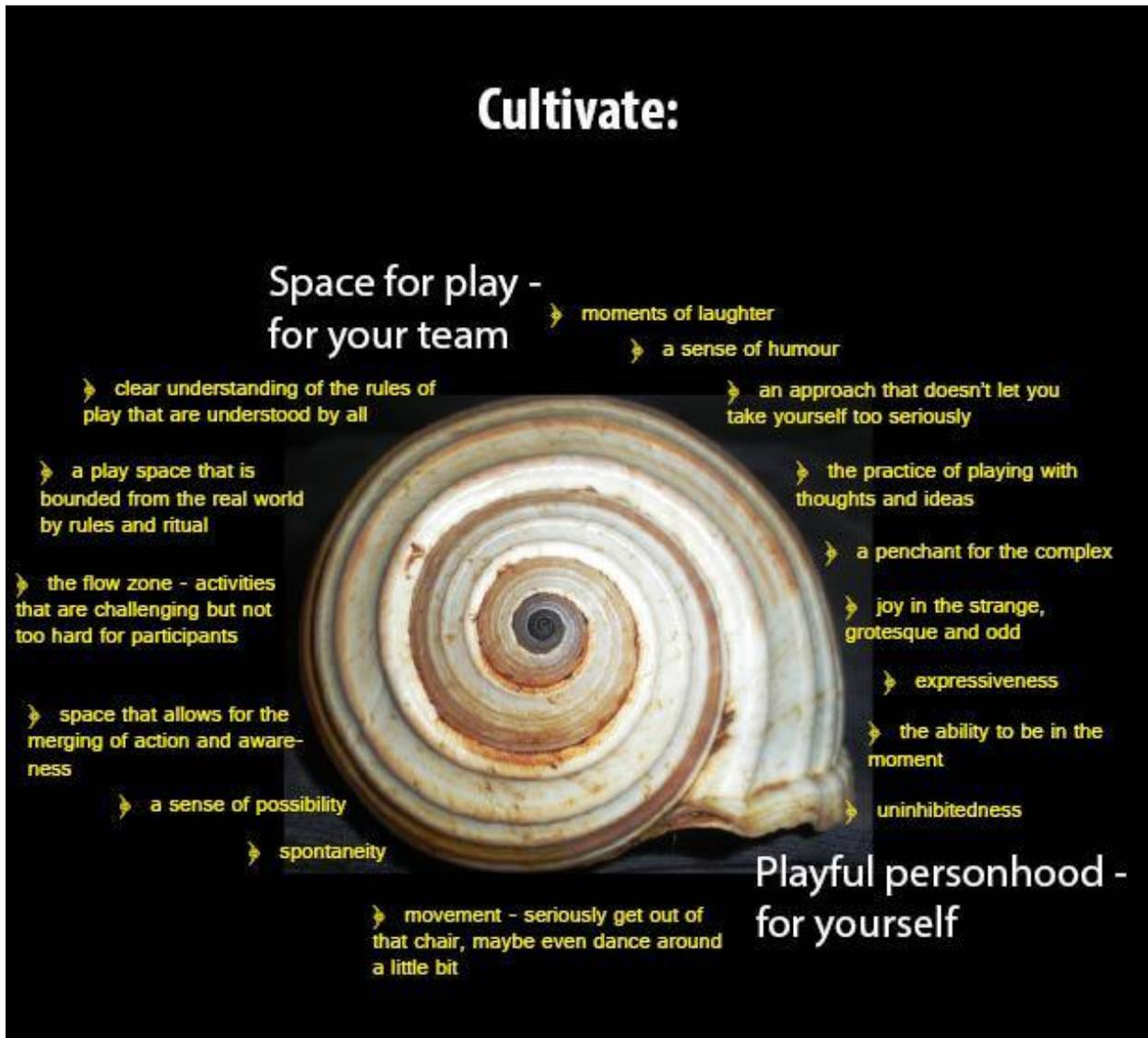
On a rocky seashore a group of children scramble over wet boulders and run along sandy stretches of beach on the hunt for the perfect seashell specimen. When one of them finds it – a beautiful spiralling conch shell – her response is universal; she puts it to her ear, listening to the sound of the ocean waves contained within. The other children gather around and take turns listening in awe. An older man walks towards the children and they greet him excitedly holding the conch out towards him, gesturing towards his ear, prompting him to listen to the magic of the sea contained within a shell. What happens then, dear reader? Does this grandfatherly man patiently explain that it is not the sea they are hearing but rather ambient noise resonating in the shell? No. Rather, he takes the conch to his ear and his face too lights up in wonder – the sea in a shell. He gasps. “I think I hear a mermaid singing” he exclaims handing the shell back to the children who dance excitedly clamoring for another turn with the shell so that they too can hear the magical song.

The spiral of a shell is container for magic and wonder. It is an enabler of play, of the shared suspension of disbelief, and the perfect representation of the principle *be playful*.

When admonished to be playful planners could be expected to become defensive or confused. Playfulness is amorphous as it refers to both a personal trait and a way of acting in the moment. It is often seen as a characteristic of children or as an innate character trait that cannot be adopted easily. In order to assist planners in becoming more playful in their practice the seashell spiral (Figure 15) presents some factors needed for building playful personhood and playful interactions (Barnett, 2007; Csikszentmihalyi & Bennett, 1971; Leiberman, 1977; Proyer,

2014, 2017). Planners can use this spiral to reflect on ways to increase their own playfulness and to build play situations into their planning practice.

Figure 15. Mayoh-Bauche, 2018. The seashell spiral



Skills necessary for and nourished in the act of play are particularly well suited to functioning in a complex planning environment. The ability to be spontaneous and take direction from one's intuition are central parts of playful activity but are often excluded from the workplace. As adults, we have been trained towards the predictable, structured, and socially acceptable. When we are constrained by cultural norms, unnecessary or outdated institutional

policies, or by our own fear of failure, however, we are less likely to be innovative and insightful.

Tools for being playful. Social norms and regulations run deep. It is often difficult for adults in the workplace or educational space to adopt a playful attitude and we often need to do something deliberately in order to create space where play is possible (Proyer, 2014). Prototyping tools and strategies employed in design can promote a playful attitude (Hohmann, 2006). Modelling with clay, building with Lego, and role-playing may help us move beyond self-consciousness. In addition, role-playing can be useful as a strategy in educational planning.

Design thinking approaches draw attention to the importance of physical space and the configuration of online space and encourage planners to play with and in these spaces. Planners are encouraged to try out learning activities or play out interactions that may occur in learning situations. While this may sound uncomfortable, even ridiculous, it is in moving past discomfort that we open ourselves up to new ideas and approaches. Engaging in playful processes within the context of interdisciplinary teams or collaborative groups of various stakeholders can be especially effective in building strong connections; letting one's guard down is a good way to promote intimacy.

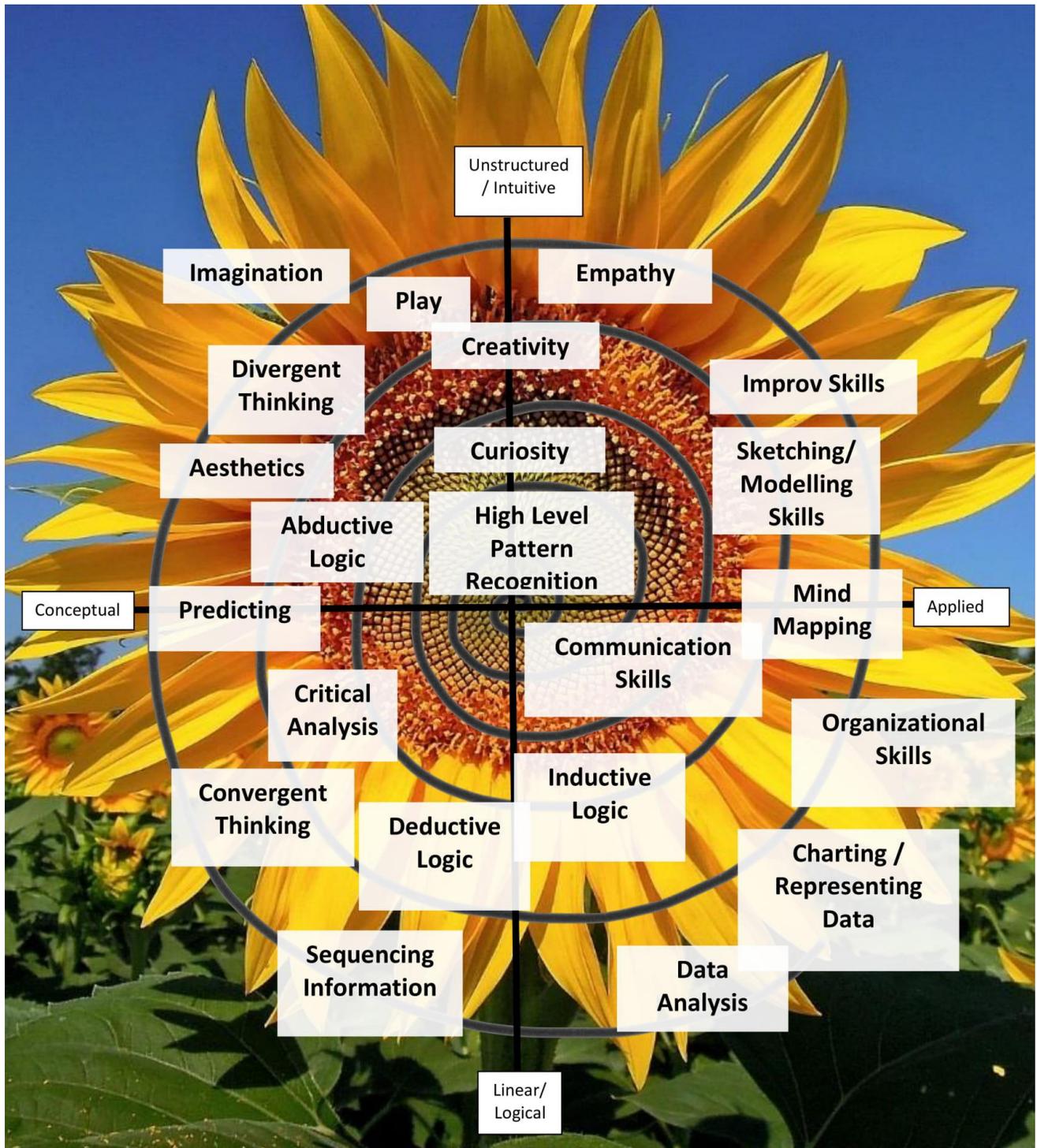
Other tools for being more playful include toys and games which have been utilized both by designers and with learners (Li, 2008) in order to push the boundaries of self-growth. Building toys such as Lego are popular for planning within the realm of business and strategic planning. A variety of games, including games designed for business and management planning and improvisational games, may also be adapted for planning and learning. Gamestorming and *Innovation Games* (Hohmann, 2006) house inventories of games that can be used in educational planning.

Be creative: The sunflower spiral. The sunflower spiral (Figure 16) reflects the importance of creative expression. While playfulness is a mode of being, creativity incorporates actual acts of creation, the bringing into being of something new and valuable. The spiral pattern in the centre of a sunflower is composed of seeds, the origin of plant life, which in turn sustains all of creation through the circle of life. Seeds are often employed as metaphors for the genesis of the new as in “the seed of a thought” or “the seeds of change.” Therefore, I have chosen the sunflower as a representative of the spiral of creativity central to the spirit of complexity-informed planning.

Unlike other planning models, design thinking stresses the role of the individual planner’s unique perspective in the decision-making and planning process (Considine, 2012). This is complemented by complexity theory’s focus on the integration of the subjective perspective of the researcher (or planner) into the change process (Morin, 2008), recognizing that planners are embedded in the same complex systems they and others are working to change. Figure 16 presents a number of qualities and skills important in the planning process. While all of the traits on the sunflower spiral are valuable, the traits on the top half (the unstructured / intuitive end of the Y axis) are especially relevant to considerations of creative planning. Planners need to recognize the value of attending to and building on less tangible and more intuitive traits like these as they are more often overlooked in planning practice. Not every planner, though, needs to possess the same strengths and abilities. Rather, like an expert designer, skilled planners should recognize and build upon their own natural strengths. For example, some successful design professionals, such as high-level architects, have cultivated their own signature approaches to creative problem solving (Considine, 2012). While their

designs are responsive to environment and context, they also reflect the creative outlook and intuition of the particular designer.

Figure 16: Mayoh-Bauche, 2018. The sunflower spiral



Tools for being creative. There are many strategies that can be used to encourage planners to be more creative, the most important of which involve participation in hands-on creative and artistic undertakings. Image creation (e.g., sketching) can be used throughout the planning process. Welsh and Dehler (2012), for instance, use sketches to connect with stakeholders during planning. Colucci (2007) discusses the creation of images as a way to creatively gather input from others. Pre-made templates for comic books or chapbooks are a way to structure planning sketches and create artifacts that can be used to inform the planning process. In order to mitigate the discomfort some individuals may have with sketching and drawing, individuals could also use photography or digital image creation tools to express their perspectives. Alternatively, sketching can be made more adult friendly through the use of media tools like Sketchboard, Adobe Sketch, and Powtoon to visualize ideas. The creation of multi-media resources or presentations (videos, interactive presentations, etc.) can also be utilized to strengthen one's creative muscle and to further aims of the planning process. Creating a narrative through images can support the articulation of design options and decisions. Planners can create storyboards outlining aspects of a program either by sketching or using online tools for creating storyboards and comics such as Pixton and Storyboard.

Summary of spiral models and key principles. In this chapter, I began with an overarching spiral that illustrates the key principles for emergent planning, The Spirals Model of Emergent Planning. Drawing from the natural world, I then presented six spirals that highlight principles for complexity informed planning:

- The galaxy spiral: Attend to context;
- The whirlpool spiral: Connect;
- The tropical storm spiral: Disrupt;

- The Romanesco spiral: Iterate;
- The seashell spiral: Be playful;
- The sunflower spiral: Be creative.

For each principle, I sketched some implications for planning principles and concluded with a recommendation for specific strategies or tools that might be used to enact that principle. Next, I turn to an exploration of what emergent planning may look like in actual practice.

Envisioning Emergent Planning in Action

Karpiak (2000) argues that the prevailing model of program planning springing from Tyler (1949) can be turned on its head by complexity theory's insights into system interactions and suggests that adult educators explore models more responsive to the complex nature of reality. In this section, I take up her challenge and begin to articulate my understanding of what a complex model of planning might look like and the implications of the spiral models in actual practice. I will do this in two ways. First, by suggesting and exploring another metaphor meant to provide an alternative conceptualization of the mental and emotional space in which planning takes place. Second, I will detail the application of the Spirals Model of Emergent Planning (Figure 10) and tools for emergent planning discussed above by exploring how they are applied in a planning vignette detailed in Appendix A.

Cervero and Wilson (2006) use the metaphor of the planning table as a way to explore power dynamics and inequities of voice in the planning process. The table they reference, though, does not immediately call to mind the intimacy of a kitchen table, the coziness of a coffee table, or the playful strategizing of a pool table. Rather, it is likely that many readers assume that the program planning table looks more like a boardroom table with all the accompanying connotations of bureaucracy and managerial functions. I propose the metaphor of

the planning studio (Figure 17) as an alternative space in which planning can take place not only literally, but more importantly, figuratively. It should not be too hard to call to mind a concept of what a planning studio may look like. Many studio spaces designed for innovation and transdisciplinary collaboration share common features such as vast, loft-like structures with high ceilings, rounded (non-linear) tables and walls, flexible furniture, home-like elements such as low seating around coffee tables, and plenty of space to sketch and iterate (white-board walls, proto-typing supplies such as sticky notes, Lego, and clay). Planning studios are similar to artists' and architects' studios as well as the more streamlined innovation labs housed in cutting-edge tech companies. The use of studio-like spaces in planning and learning has a long history connected to studio-based learning approaches in art and architecture, particularly the Bauhaus

Figure 17: Mayoh-Bauche, 2018. The planning studio



movement that originated in Germany in the early 20th century. The utilization of studio-like spaces was also seminally employed by Dewey in his Lab School in Chicago in the late 1800s (Lackney, 1999).

The environment of planning is important as research suggests that the physical space in which an activity takes place can impact the approach to that activity and increase or decrease creativity (Drake, 2003; Kallio, Kallio & Blomberg, 2015; Kristenson, 2004). While planners may not always be able to shift the type of physical space they inhabit while doing their work, conceptualizing their workspace differently may have an impact. In contrast to a meeting room environment, where people may assume that there is a pre-ordained linear agenda, in a studio environment many elements of the space promote fluidity, iterative prototyping, and creativity. What, then, might planning look like if it took place in a studio or studio inspired psychic space and how might the Spirals Model of Emergent Planning (Figure 10) inform that process?

The planning vignette in Appendix A describes what emergent planning utilizing the Spirals Model of Emergent Planning (Figure 10) may look like in a hypothetical planning situation. In this scenario, health educators are striving to develop a responsive program that helps individuals with type two diabetes live a healthy life. My purpose in preparing this vignette was to both illustrate each emergent planning principle in action and also to show how different spirals may overlap and interact when planning is dynamic.

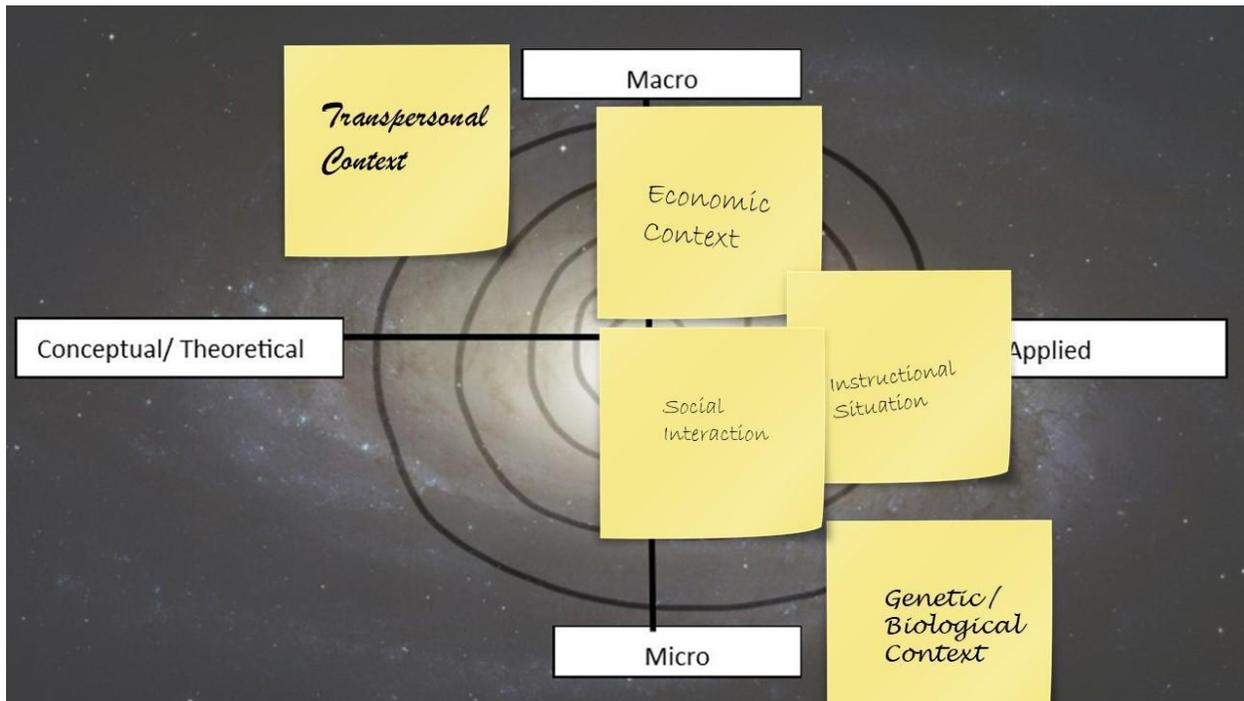
Implications of the galaxy spiral: Attending to context. The proposal of the planning studio metaphor as a way to reimagine planning context is designed to prompt consideration of not only the context of the programs that we plan but also the context of the planning work that we do. As described earlier, planners must attend to both the physical and affective domains in which planning occurs. The physical space of the planning studio is designed for

transdisciplinary collaboration and creativity. It is not static or linear like a meeting room table. The lived experience of working in a studio physically primes people for alternative approaches to activity than a meeting room would foster. This is deliberate and based on a holistic understanding, related to current adult education scholarship, that learning and creativity are not exclusively mental, but rather are informed by social, physical, and affective processes. By being consistently aware of our assumptions about the appropriate context for planning activities we can open our planning processes up to being more responsive and creative.

The galaxy spiral (Figure 11) offers a particular tool that can be applied to increase awareness of the range of contexts which impact the programs that we plan. An example of the use of the galaxy spiral is described in the planning vignette (Appendix A). To start, planners considered the planning context (Appendix B) in order to survey levels of context which may impact their program. They initially identified the economic context, social interaction, and the instructional situation as particularly relevant to their program and charted these with sticky notes on the galaxy spiral. As they progressed through their planning process they added the transpersonal context and the genetic and biological context to their galaxy spiral for consideration (Figure 18). Displaying the applied galaxy spiral together with other relevant artifacts in their workspace (Appendix A: Figure 19) prompted discussion and reflection about the impact of varying levels of context on their program. This translated into the inclusion of experts on some of these levels of context (the researcher focused on the genetic and biological context of diabetes) in their planning team as well as the incorporation of particular activities designed to address contextual issues in their programming.

Implications of the whirlpool spiral: Fostering connection. The physical space of a studio setting promotes social interactivity and connectivity. The whirlpool spiral (Figure 12)

Figure 18: Mayoh-Bauche, 2018. Applied galaxy spiral



promotes planners to look more deliberately at ways to promote connection. In a planning studio, seating is limited or not particularly comfortable (such as the use of stools at high round tables) to encourage people to do things together rather than just think. Small groupings of furniture promote close interactions of small groups of people in an informal manner to promote increased sharing which may be constrained by the large-group formal atmosphere of a boardroom. While the planners in the vignette (Appendix A) do not utilize a studio space, they pursue planning opportunities outside of the boardroom which utilize some of the same strategies that a studio might. By holding planning meetings in community spaces, the planners avail themselves of flexible furniture and other environmental strategies for promoting intimacy amongst the planning team. They also hold consultation activities with learners as social events and therefore utilize casual configurations of space and the flow of social interactions to build trust and rapport and to push planning insights in more creative directions.

The planning vignette (Appendix A) provides other examples of strategies and tools for building connection. The planning team, for instance, is made up of individuals from a variety of backgrounds, including a community researcher not directly associated with the program. Program participants take their projects into the broader organization and community. Planners and learners connect with physical artifacts as part of their learning processes. Together with the use of cohorts in the learning environment, these strategies help to establish strong connections between learners, all course participants, and aspects of the larger community.

Implications of the tropical storm spiral: Disruption. The use of studios by cutting edge tech companies to promote innovation is not an accident. As companies strive towards the creation of disruptive new technologies and processes, they house their work in spaces that are responsive enough to suit work processes and outcomes which may change drastically over time. Even the furniture in a studio is flexible and meant to be rearranged to suite emerging needs. Working in a studio environment is itself a disruption as it does not lend itself to typical hierarchies and workflows. As is the case with many disruptive elements, the disruptive power of a studio space may be best identified by the resistance it occasions. In describing the studio like environment of the University of British Columbia's Innovative Learning Centre, Crichton (2013) notes an occasion when a university educator spent much time and energy dragging various styles of flexible furniture into haphazard rows in an attempt to recreate a traditional classroom space.

The planning vignette (Appendix A) illustrates a planner's use of minor disruption to create changes in an educational undertaking. Vanya, the planner, deliberately asked the initial planning group to prepare and advocate for three alternative instructional plans for the course. Both undertaking this process (moving away from the attractor state of familiar, lecture-based

instruction) and the clash of varying viewpoints as the three alternatives were argued for caused some discordance and discomfort. Rather than quickly coming to an agreed upon course of action for instruction, the early planning process resulted in a large “menu” of options of learning strategies, some of which were contested by one of the three planners / instructors. Ultimately though, the process of identifying with, communicating the value of, and asserting for an alternative teaching model in the face of some opposition assisted the instructors in moving away from their lecture-based comfort zone. In a messy discussion regarding the value of the three very different educational strategies for learners, the planners were able to identify and parse nuances of their program which would not otherwise have garnered attention in a more straightforward, linear analysis. Experiencing a discordant planning process also helped prepare instructors to plan and teach, as they ultimately decided to do, in a manner that involved collaboration with learners and community members; such collaboration is necessarily messy. In planning discussions, team members bring varying information and perspectives and discordance is relatively minor, but these variations bring some a degree of disruption and move the process away from conservative attractor states, both when it comes to planning and instruction.

Implications of the Romanesco spiral: Iteration. As noted in the above descriptions of studio workspaces, studios are generally well supplied with hands-on materials that promote the creation of low-tech prototypes and iteration from an initial prototype towards a more finished plan. In the planning studio sketch (Figure 17) we can see small blocks and construction materials as well as coloured paper and art supplies which can be used in iterative planning. The planning vignette (Appendix A) provides examples of how a planning team can use large scale iterative process to address learner need. For example, “The planners spiraled back to many aspects of planning practice throughout the program. While they set an initial time and location,

the instructors discussed these with learners on the first day.” The vignette (Appendix A) notes how planners adjusted the time of programming initially in response to learner need. As the learning progressed to incorporate more group work, the balance of learning activities changed (e.g., all group work some days, other learning activities on others) in order to accommodate groups who wished to perform their group work elsewhere or remotely. Learning activities were not all pre-determined. The web activity, for instance, was initiated by a group of learners. With prompting from the facilitator, there was further discussion about and presentation of personal traits for learning. Group members who had an interest in knitting contributed to the presentation of artifacts as a knitted web. The flexibility and responsiveness of iterative processes within this initial portion of the course prompted learners to be creative and look outside of the confines of the training space in planning their group projects.

Implications of the seashell spiral: Playfulness. The relationship of a studio space to the arts, architecture, and other design disciplines calls to mind a flexible, creative, design-informed process. The image of the space itself also suggests planning activities that may not be part of a traditional educational process. These activities, such as sketching, the creation of physical prototypes, and role playing, can be utilized to great effect. Within the vignette (Appendix A), the planners deliberately engaged in a playful activity with former program learners in order to gather feedback about their learning experiences. Learners posted drawings and notes on the wall in teams and then circulated in order to provide feedback on other team’s contributions, adding to sketches, labelling, and making notes. This playful team-based activity built connections and broke down some of the barriers to feedback regarding programming. Feedback was community generated, first in teams, with later teams generating addendums. Learners consequently, did not have to feel individually accountable and may, therefore, have

been more open in their feedback. In addition, having a sequence of events, with an active, community-building activity scheduled before a challenging discussion, increases the likelihood that learners will open up and provide honest feedback about their challenges as they are energized and comfortable with the group.

Implications of the sunflower spiral: Creativity. The idea of a planning studio points to some personal characteristics planners may benefit from fostering including creativity, playfulness, and a focus on contextually-situated practice-based problem solving. The concept of planners utilizing a studio-based approach may also suggest that, like expert designers (Considine, 2012), educational planners would benefit from letting go of the idea of finding the objective best solution and instead foster their personal skill sets and signature approaches to planning. The sunflower spiral (Figure 16) provides a prompt which assists planners in developing their own planning perspectives and fully utilizing their own particular strengths, especially creative ones. The planners in the vignette (Appendix A) used the sunflower spiral to assess their own individual strengths as well as the strength of their team; for example, by asking the questions as one interacts with the sunflower spiral:

1. Do I utilize a balance of rational and non-rational aspects of cognition in my planning?
2. Do I possess skills in both applied areas of practice and conceptual ones? If not, how can I seek to balance my skills in these areas?
3. What are my strongest skills as a planner (and possibly as an instructor)? How can I better utilize my particular strengths and expertise?
4. Are there skill sets that I lack completely or feel that I need to improve in order to meet the challenges of my current practice? How can I do so?

5. What are the skill sets of my colleagues, learners, and stakeholders? How can I utilize their strengths in the planning process?

The sunflower spiral is not meant to suggest that all planners need to master all of the skills listed or possess similar levels of skill across all areas. Rather, the sunflower reminds us that we need to utilize different types of skills in order to be creative throughout the planning process.

Bringing it all together. As the planning vignette (Appendix A) illustrates, the principles of emergent planning flow into one another and work in a complimentary manner. As planners work to become more aware of context we naturally engender more connection which then builds further awareness of context. Promoting disruption requires the use of iteration as we must be able to pick up the pieces and move forward towards creating a new better program when disruptive influences cause current practices to become passé. The interconnected forces of creativity and play will prompt us to iterate, push past our comfort zones, and even disrupt. Together the principles of emergent planning work to move planners away from attractor states prompted by technical rational practice and further into the complex realm. I will turn now in Chapter 6 to exploring the implications of taking up this complement of emergent planning principles for planning theory and practice writ large as well as for my own personal planning practice.

Chapter 6

Disruption in Action: Discussion of the Spirals Model of Emergent Planning

The Spirals Model of Emergent Planning (Figure 10) presented in this research is a reaction against much early adult education program planning literature ensconced in a technical rational perspective on planning (Houle, 1972; Knowles, 1950). The focus on creativity and emergence in this study suggests that a linear plan for achieving pre-ordained objectives neither accurately reflects the reality of change nor offers an effective approach to planning. Rather, the concept of emergent planning taps into recent trends within adult education to make planning more interactive (Caffarella & Daffron, 2013), context responsive (Cervero & Wilson, 2006; Sork, 2000) and creative (Sork, 2010). The search for more responsive planning models is exemplified by Sork (2010):

In the coming years, the challenge [in adult education program planning] will be to leave behind ways of thinking about the planning and delivery of programs that limit the possibilities and constrain choice, and embrace those with the potential to engage, amaze and transform. (p. 164)

The Spirals Model of Emergent Planning (Figure 10), which draws on theoretical and empirical literature on complex planning, is my contribution towards efforts at transforming adult education program planning. I offer six key principles for planning in an emergent manner as well as specific tools which can be utilized to apply these principles in planning practice. I also exemplify emergent practice through my research process which utilized art and design inspired activities. My research and model building process suggests that creative inquiry through arts-based methods can be used as a way of engaging with complexity theory and design thinking. In addition, the creative inquiry approach I used might also be adopted by others with an interest in emergent answers to theoretical questions.

In the remainder of this chapter, I explore the significance of the creative inquiry I have undertaken and its result - The Spirals Model of Emergent Planning (Figure 10) - in the realms of planning theory, planning practice, and for my own practice as an adult educator. The chapter concludes with some recommendations for further research.

Significance of the Spirals Model of Emergent Planning for Theory

This thesis lays the foundation for planners to understand the design of learning activities and educational programs in a way that is neither linear nor predictable. Emergent change within complex systems occurs as a result of rich connection between diverse nodes in decentralized networks and the interaction of recursive feedback and disruption interacting with attractor states in the system. Significant change occurs when disruption is substantial enough to cause disequilibrium and pushes the system past a tipping point into new modes of being with their own new attractor states. By conceptualizing change as a non-linear, relational process, planners may be able to understand and approach their planning tasks differently. We may indeed be able to adopt an alternative ontological basis for planning, at least on some occasions, but we also need to recognize the indeterminate nature of reality and be willing (and able) to live with the discomfort of disruption rather than the certainty of pre-ordained objectives and “best practices”.

The six principles of emergent planning - attend to context, seek connection, disrupt, iterate, be playful, and be creative – point planners towards a new way of promoting change and structuring educational activities. These principles, and the emergent perspectives from which they spring, prompt us to embrace ambiguity and see the role of the planner in education as one of facilitating change. As planners, we also need to strengthen connections within educational systems, especially when there are diverse perspectives, carefully and purposefully introducing disruption and contradiction in order to allow for emergence. It is of course vital that planners

attend to other necessary components of educational undertakings, the schedules, the curricular and marketing plans, but with the understanding that these are less like pieces of a puzzle set, locked into place, and more like the indeterminate, alterable helium balloons of Karpiak's (2000) imagining.

In undertaking a theoretical study and presenting the Spirals Model of Emergent Planning, then, I am not attempting to provide conclusive or directive answers about the role of emergent approaches or the "correct" ontological orientation for program planning. Rather, I am interested in utilizing an iterative orientation embedded within complexity theory and design thinking to make connections and tentatively propose an alternative approach offered as a springboard for the program planning realm. Kuhn (2008) stresses that one must contextualize complexity theory, like all other perspectives, as a socially embedded phenomenon. I, therefore, attempted to make explicit connections between complexity theory and other philosophical perspectives including pragmatism, critical theory, and post-modernism and to contrast it with positivist perspectives, especially those inherent in technical rational approaches.

I have focused on the contributions of complexity theory and design thinking in proposing this alternative in part because of the pattern established in adult education scholarship by individuals such as Fenwick (2006, 2013), Fenwick and Edwards (2013), and Lange (2015). Like these scholars, I draw together a number of perspectives in a multi-referential web consistent with the ethic of transdisciplinarity (Alhadeff-Jones, 2012; Lange, 2015). As an approach arising from practice, design thinking honours the dialogic relationship of the theory/practice pair (Morin, 2008) and enriches my study's relevance across disciplines. My inclusion of design thinking also bridges Kuhn's (2008) caution to educational researchers that

complexity theory and education have fundamentally different orientations towards the world, with complexity theory being descriptive and education being goal oriented.

Significance of the Spirals Model of Emergent Planning for Planning Practice

This study, I argue, makes a small contribution when it comes to preparing planners to be more attentive to the reality of change in human systems, as well as better prepared to respond to disruptions and perturbations in these systems in order to foster emergent change. The structure of the Spirals Model for Emergent Planning (Figure 10) as a framework of principles for the planning process can be utilized together with other planning methods. Inspired by the work of Gboku and Lekoko (2007) on African perspectives in adult education planning, the Spiral Model responds to Karpiak's (2000) call for adult education scholars "to plan in ways that more closely align with human action and interaction...to discover alternative models, open-ended, open-system models that allow for the outburst of an idea, an inspiration, a problem or chance" (p. 40).

This thesis strives to provide a fluid guide to and illustration of how change works in natural processes and how emergent planning can be carried out in educational settings. As discussed earlier, planning processes conducted as an iterative loop are inherently more responsive to learner needs than linear processes. Planners need to question institutional policies and processes that pull us towards behaviour that separates planning from implementation; for example, the primacy of pre-determined learning outcomes, or expectations of having a complete, detailed syllabi or curriculum prior to the outset of a course. Planners also need to identify processes that allow them to implement new, but not yet fully developed programs, and to learn from doing. These may include small-scale pilot programs that grow incrementally over time, participatory action research projects, and collaboratively designed courses that involve

learners in program design throughout. Crichton (2013) argues that there is a need for innovative, scalable practices within education, especially when addressing complex problems.

Ultimately this study challenges planners to reconceptualise the very core of their roles. As White and Levin (2016) point out, occasioning learning is often “more an opportunistic form of activity than a planned form of activity” (p. 76). Emergent planning, then, requires planners to step out of the way and act as facilitators. Asking planners not to engage in planning, the very activity at the core of their professional identity, is likely to provoke resistance and confusion especially as the drive to formalize adult education planning processes sprang from an effort to professionalize the field and give planners more professional legitimacy. Efforts at reversing that formula could then be regarded as a threat by educational professionals.

But rather than viewing resistance and confusion as a problem for the field of adult education program planning, complexity theory presents it as an opportunity. As I have noted, disorder and disequilibrium offer a rich soil from which dissipative structures and emergent re-ordering can spring. I propose, then, that the need for renewal may be even more urgent in adult education program planning than Karpiak (2000) identifies it to be in the field of adult education as whole. The disruption caused by complex understandings of planning, while unsettling, may be necessary to allow for emergence in planning practice.

The tools that a planner uses can have a significant impact on the way that their planning unfolds and whether or not it is open to emergence. It is hard to plan in complex way when utilizing tools designed for technical rational ends. It is essential, therefore, that planners have access to new tools and strategies that support an emergent approach. One key conceptual strategy grounding the Spirals Model of Emergent Planning (Figure 10) is the use of the problem solving process of abduction, the reciprocal framing of both the planning question and the

answer while working towards a desired value in an uncertain, complex context. Planners can use abduction to approach the pursuit of educational goals for which both the process to get there and the desired end program state are unclear. In order to function in an abductive manner, however, program designers, myself as a researcher, and planners need to utilize creative activity. Strategies for emergent planning include iteration, collaboration, and artistic activity as tactics for shifting the overall approach to planning. The application of these strategies was highlighted in the metaphorical re-conceptualization of planning space from the (boardroom) planning table to one of a planning studio. Specific tools that enable planners to utilize a design thinking process include interactive games, role-playing, mind-mapping tools, statements of relational ethics, and artifacts amongst others. The richness and variety of these tools allow planners to inject playfulness and creativity into their work and to reinforce the spirit of playfulness and creativity in learners.

The importance of creativity and arts-based approaches. As I entered into my research process, I realized that if I was going to create an emergent planning model, it would be inappropriate for me to do so in a static, uncreative way. In reading the work of complexity theorist and educator Montouri (Montouri & Donnelly, 2013), I was inspired by his definition of creative inquiry.

Creative Inquiry starts from an attitude of “not-knowing,” a willingness to accept the illusion of familiarity that covers the vast mystery of existence. Creative Inquiry hinges on the examination of one’s positions in the process of inquiry, and challenges fundamental and underlying assumptions that shape inquiry. The goal is not to conclude the process by having the correct answer, but to encourage a more expansive, spacious approach to inquiry that actually generates more potential inquiry and illuminates the creation of knowledge rather than stopping at the one “correct” answer. (p. 7)

As I immersed myself in design thinking and complexity theory research, I noted the importance of creative tasks such as sketching, modelling and improvisational role-playing in the design process (Cassim, 2013; Cross, 2007; Lawson, 2006). In order to fully engage with these theories, I knew I would have to undertake this kind of creative thinking and practice myself. As Knox (2012) argues, it is important to build the capacity for creativity of all of those involved in adult education and in providing cultural leadership more broadly.

My use of creative inquiry was further inspired by arts-based adult education (Clover, Sanford, & Butterwick, 2014; Lipson Lawrence, 2005; Roy, 2014) which celebrates the value of the creative and aesthetic and challenges the status quo on ideological and political levels (Clover, 2013). McGregor (2012) traces the use of pedagogical tools that create productive ambiguity, including fictional narrative, material objects, zines, and photo-voice, and which also hold promise as tools for creative planning. Butterwick and Roy's (2016) exploration of arts-based practice on the margins of society traces the stories of various artistic processes and programs from film festivals to dance. To date, however, there have been very few explicit treatments of program planning through a creative or arts inspired lens.

Creativity is central to complexity theory and design thinking. Capra (in Karpiak, 2000), for instance, asserts that "creativity is inherent in life" (p. 32). Creativity has also been highlighted by philosophers of complexity theory (Morin, 2008; Montuori, 2005, 2011; Montuori & Donnelly, 2013). Even complexity scientists such as Nobel laureate Murray Gell-Man (2014) have shown a strong interest in the psychology of creative thinking which is reflected in the practice of inquiry in complexity science. A primary mode of research in complexity science is the modelling of complex phenomena using computer modeling software (Mason, 2008). Researchers create virtual, visual representations of phenomena, modelling the rules that govern

system interaction, and observe what occurs when the initial conditions are changed. These models are often game-like in appearance and encourage wild speculation and repeated iteration. A focus on creativity, however, is not limited to complexity studies; design scholars consistently identify creativity as being at the heart of design undertakings and have explicated the traits and practices that make up a creative attitude (Banathy, 1996; Lawson, 2006; Owen, 2005).

While creativity can be applied in many realms, aesthetics, highlighted in the sunflower spiral (Figure 16), is a key element often stressed in definitions of creativity. Artistic creation, in many of its forms, necessitates consideration of the aesthetic. The *be creative* principle in the Spirals Model of Emergent Planning (Figure 10) reminds us to attend to the aesthetic context for and aspects of planning. In answer to the Knowles' (1970) urging, emergent planners must consider aesthetic elements of the space of learning, educational materials, and the artful construction of the learning process as a whole.

Considine (2012), though, goes beyond aesthetics in creative expression and points to the importance of serious play, both for its creative potential and its implications for planning more broadly (Figure 15: The seashell spiral). Many educators have sensed that the social problems facing our world and our educational institutions are increasingly complex and do not respond well to traditional linear approaches to problem solving. Because of our own social conditioning, fear of failure, or self-consciousness, however, we often cannot step outside the confines of tradition or the status quo to envision or promote new approaches. Play lets us leave that behind. When we play, we inhabit a new psychic space that is comparatively freer from society's norms and expectations. As well, space for play is reciprocally constructed by those involved, an important skill for collaborative, emergent planning. We can imagine children playing house – when one child lays the imaginary baby in the sink it instantly becomes a crib for all involved in

the game – a new aspect of the shared reality takes shape. As we plan in an emergent manner we must strive to be those children, responding flexibly to context and connection to create a new reality.

While the idea of letting go of the control that comes with pre-ordained objectives and expert interpretation of needs-assessments and wading into the messy bottoms-up world of emergent planning may be intimidating, both the seashell (Figure 15) and sunflower spirals (Figure 16) point to attitudes and skills that move us towards joy. Enjoinders to be playful and creative are not merely niceties, but necessary steps for emergence. It is in playing and using creative methods of thinking and doing that planners can make new connections, iteratively introduce novel approaches to programs, and draw stakeholders and learners into the realm of uncertainty to work there together for positive change. This is why scholars within adult education have long urged planners to move toward creativity and the arts in our practice (Knowles, 1970; Lindeman, 1926).

Perhaps now is the time to heed those urgings towards creative approaches to adult education program planning. As we gain an increasing understanding of the strategies of artistic planning within design and the importance of creativity within complex change, we can now turn to Sork (2010) as he prompts us to recognize the indeterminacy and artistry in planning by approaching it as if it were improvisational theatre. Sork's (2010) analogy is bolstered by its similarity to images of improvisational dance or co-determined choreography referenced by complexity theorists from the sciences (Maturana & Varela, 1987), education (Davis & Sumara, 2006), and instructional design (Irlbeck et al., 2007). In improvisational theatre and dance we can glimpse the heart of play which is exemplified by the attitude of “yes, and...”, a rule from improvisational theatre that insists that no matter what another participant suggests about reality,

we must say yes and expand upon it. When your partner in an improv game, for instance, yells out “Oh no! Your head is turning into a tomato!” it is incumbent upon you to adopt a tomato head as the new reality and act on its implications. When we as planners integrate a “yes, and...” ethic into our responses to context, learners, and other influences within the educational realm we begin to embody the spirit of emergent planning.

Significance of the Spirals Model for My Practice as an Adult Educator

Applied artistic processes (Figure 16) that are intuitive and unstructured are key to creative engagement in planning. Planners, though, need to utilize the fearlessness inherent in a playful attitude to overcome their hesitancy to “do” art. Actually incorporating artistic acts such as drawing, painting, modelling, or acting as a part of the planning process ensures that planning is more responsive. My personal journey in this research has required the nurturing of a larger creative ethos. Inquiry through sketching, mind mapping, and modelling pushed my academic understandings and research findings in a more holistic direction. The divergent thinking involved in sketching out ideas and connecting nodes within mind maps opened me up to connections among concepts from varying disciplines and practices in varying fields. As I conducted my research, I began to practice photography in order to flex my creative muscles and diminish my fears of sharing my expressive output with the judgemental world. As a person who has long been most comfortable in the realm of ideas, it took the physical acts of creation to push me out of stale attractor patterns and into new, more diverse ways of looking at my role as a planner. Sharing my creative outputs also helped me overcome some of the social fears that had held me back from being sufficiently connected and relational in my practice.

While the institutional setting in which I work and plan has its own conservative attractor states, I have begun experimenting with ways of disrupting them, moving the needle towards

more creative, emergent approaches. I have begun to undertake my own planning tasks in a more responsive and artistic manner, modelling for others around me how creative inquiry can assist in the planning process. I have engaged with my department in order to move towards more of an iterative loop, so that all educational offerings are modified in response to learner feedback and interaction. I have also submitted a proposal for the creation of a planning studio environment within my workplace.

While the changes to my professional practice have been notable, the largest impact of this research has been on my own orientation towards learning and change. As I complete this master's degree, I am beginning work on a project that has long been of interest to me but that I now have the creative confidence and the necessary perspective to make happen. I have started the process of planning and creating interactive mystery games which will utilize mobile technology to facilitate interactive role playing amongst adults. I will be launching a series of apps, initially strictly as games, with the goal of eventually creating products that will allow for game-based learning as well. The foundational concepts of emergent planning and the creativity and playfulness central to this research experience have prepared me to undertake this process. I have also gained confidence in my ability to iteratively create game-based interactions that will be valuable for the playfulness and connection they engender. The insights I have gained in moving away from the search for certainty towards ambiguity have had significant impacts in many areas of my life.

I have experienced immense joy in immersing myself in the various philosophical bases of adult education as well as the ontological orientations and more applied insights of complexity science, complexity theory, and design. It was for myself and for this joy that I decided to explore such a big picture topic. I believe that the joy of learning is a positive force in the world

which has constructive impacts in ways we do not always see or understand. The creativity and joy I have embodied throughout the process of this study may be one of the benefits of this research that can extend beyond me to other planners and practitioners as well.

Challenges for the Practice of Emergent Planning

Movement towards connection and creativity in emergent planning is a positive trend and I have personally experienced the transformative effect of applying creative tools and strategies within my research and engaging in a more creative manner. Even with the wealth of models and tools available, however, I wonder just how likely it is that this trend will continue. In our current neoliberal society, is it realistic for planners to attempt to orient planning away from technical rational ends? Is there room in an efficiency-obsessed world for an approach fueled by creativity and connection? Or, has the time for those values passed? In a globalized environment where we are constantly asked to do more with less and calendars are full, do we have the resources necessary to commit to emergent planning processes? In some cases, the answers to these questions may be no. I, however, remain hopeful.

As Davis and Sumara (2006) note, the business world was quick to recognize the value of complexity research due to its importance in ensuring flexible and adaptive organizations. The same is true of technology companies. Business has also been an early adopter of design thinking approaches and much of literature regarding design thinking's use in education comes from its application in business programs. There exists a possibility that in complex perspectives adult education program planners can access an approach that is consistent with the values of the field, even emancipatory ones, but is also appealing to neo-liberal funders due to its popularity in the business and tech industries and its ability to promote innovation.

While the application of complexity-informed planning processes will not be easy or inherently positive in all situations, learners and adult educators have a duty to be critical about the assumptions underlying complexity theory and the accompanying complex planning practices. We must attend to the critiques raised by Kuhn (2008), Morrison (2008) and others, and be wary of assuming that the realities observed in complex systems are yet more prescriptions for how education should work. We should take care to heed Sork's (2000) warning to deliberately attend to ethical considerations as we plan and to be cognisant of the complex and profound ethical issues within adult education (Gordon & Sork, 2011).

I believe that the ontological orientation of complexity theory is more compatible with the reality of the context of educational planning than the positivist ontology underlying technical rationalism, especially because complexity's dialogical approach embraces varying perspectives. However, like any other philosophical perspective or approach to planning, complexity theory and complex planning processes can be utilized in ways that are unethical or harmful. Complexity theory's popularity in business settings, while possibly making it easier for adult educators to gain funder support, also means that complex approaches to planning and learning could become interwoven with the assumptions and practices underlying business which privilege efficiency and profit over people. I encountered some examples of this within my research, especially in the realm of higher education, where speed of planning and cost efficiency were uncritically presented as the desired ends of educational planning.

Others who use design thinking as a planning model share some of these same concerns. Popularized primarily by IDEO, a design corporation, in conjunction with the Stanford University d.school and the Hasso Plattner Institute at the University of Potsdam in Germany (both funded in large part by Hasso Plattner, a German tech entrepreneur), IDEO has been active

in funding and promoting the use of design thinking as a means to address international social issues. The role of corporations, however, raises ethical issues. Design thinking was popularized in higher education through the fields of business and management education (Bruton, 2010; Welsh & Delher, 2012; Zupan et al., 2014). As Cassim (2013) notes, it is therefore important to engage with original design scholarship rather than uncritically adopting values and ideologies that are more characteristic of for-profits. I would assert, then, that whatever the approach we should be wary of strategies promoted by business as solutions to educational and social challenges. In the realm of design thinking, this concern was explicitly mitigated within the research (for example, that of Cassim, 2013) and within my own personal approach by relying more on the perspectives of creative and academic theorists rather than those arising from IDEO and its partners.

One benefit of complex methods of planning that promote bottom-up change is their ability to guard against imperialistic tendencies. Fenwick (2006) suggests that this provides a counterbalance to ethical problems that arise when institutions, planners, or instructors impose their values and desired ideological ends on learners because “they know better”. Rather, in complex approaches to planning, institutional systems promote possibilities which arise from all participants within the system, including learners. Planners would be wise to consider the possible rejoinder that if we are allowing citizen/agents within the system to mould the system, what happens if these same citizen/agents have been manipulated for capitalist ends? There are no easy answers, but a consistent awareness of these issues will help planners utilize complexity-informed planning processes in an ethical way.

In the philosophical application of complexity, these kinds of big ethical questions do not simply matter, they are at the heart of what matters. I have never before encountered a theorist so

idealistic and big picture thinking as complexity's key philosophical thinker Edgar Morin. In an understanding of complexity informed by Morin's work (1992) we can see that the difference between simple thought and complex thought is not a dry academic distinction. Rather, simple dialectical thought feeds many of the antagonisms in today's world – including the us-against-the-other thinking of both the far right and the far left. In this era, we need complex, responsive approaches which privilege connections and are sensitive to the inherent humanity of those around us and our own subjectivity and embeddedness in the systems we inhabit. We need to acknowledge the fluidity and uncertainty of knowing yet still be confident in the power of knowledge to reflect and impact the world. It is in taking a complex approach that we can begin to heal the divisions between people and mend humanity's broken relationship with our planet.

Recommendations for Future Research

It is my hope that this study will further the exploration of the role of emergent processes in planning across disciplines. The application of hands-on processes for creative inquiry such as sketching and mind-mapping was critical to the unfolding of my research and could be applied by others who desire to understand planning differently or who want to take a more creative approach to understanding theoretical research topics. I also believe that the use of the logical process of abduction (from the perspective of design) as a way to frame the mutual constituting of both one's research question and answer holds value to researchers in a variety of areas.

Other possible areas of future study are also suggested by my research. As this thesis focuses on theoretical considerations and model building, I recognize the need for further research that looks at the application of principles for emergent planning to adult education in empirical situations. Future research may focus on emergent or complexity informed planning, but it could also take the form of design-based approaches to planning or participatory action

research as program planning. Further study is also required about approaches to deliberately disrupt educational institutions and processes in an attempt to promote change. The use of purposeful perturbations by White and Levin (2016) provides an intriguing start to thought in this area but more tools and guidelines regarding the use of such perturbations would be helpful in developing a rich literature on emergent approaches to planning. Finally, I suggest that the significant literature on design thinking in education be extended into the realm of adult education.

It is my hope that this study will function as a node within the complex system of adult education program planning, interacting with others and prompting further ideas and research through those interactions in a way that is richer than I can direct from my perspective alone. Throughout the creative process I have undertaken, my hope is that the steps I take, tentative as they may be, will inspire others to join in the dance. In my rendition of the co-determined interpretive dance of complexity (Davis & Sumara, 2006, Maturana & Varela, 1987), I do not ask others to follow the choreography I perform; rather I ask them to respond with their own composition. My hope too is that, in the confluence of multiple experiences and perspectives, errors or oversights on my part may be corrected and other significant insights into emergent planning may arise.

Conclusions

I intend to take this research forward in practice within the contexts of my adult education program planning and creative work. As I discussed earlier, I will utilize many of the principles outlined here to assist in making the public policy training I develop more responsive and creative. I also look forward to experiencing the emergent opportunities that arise as I go forward with creating game-based learning in what will be an increasingly networked and

creative way. I am already reaching out to others in order to build connections and further understand the contexts in which my games are played. This marks a significant shift for me – a stubbornly independent introvert who would love nothing more than to research and plan alone in my room. My creative research process has offered me hard won lessons about the value of living with ambiguity and responding to emergent change, and I, therefore, do not anticipate where I will take this research in the future but rather look with joy towards where it will take me. My instinct is that that promises to be far. I believe that this research will shape many of my future undertakings in a profound way. I look forward to undertaking a creative voyage of entrepreneurship in the near future and imagine that I will continue my academic journey with a focus on creativity, playfulness, and innovation someday. I set out on this research journey searching for an alternative ontological basis for adult education program planning and believe that I have offered one that is promising. What I did not expect at the outset of my travels is that I would discover a scary but joyous new ontological basis for my life.

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Appendix A Planning Vignette

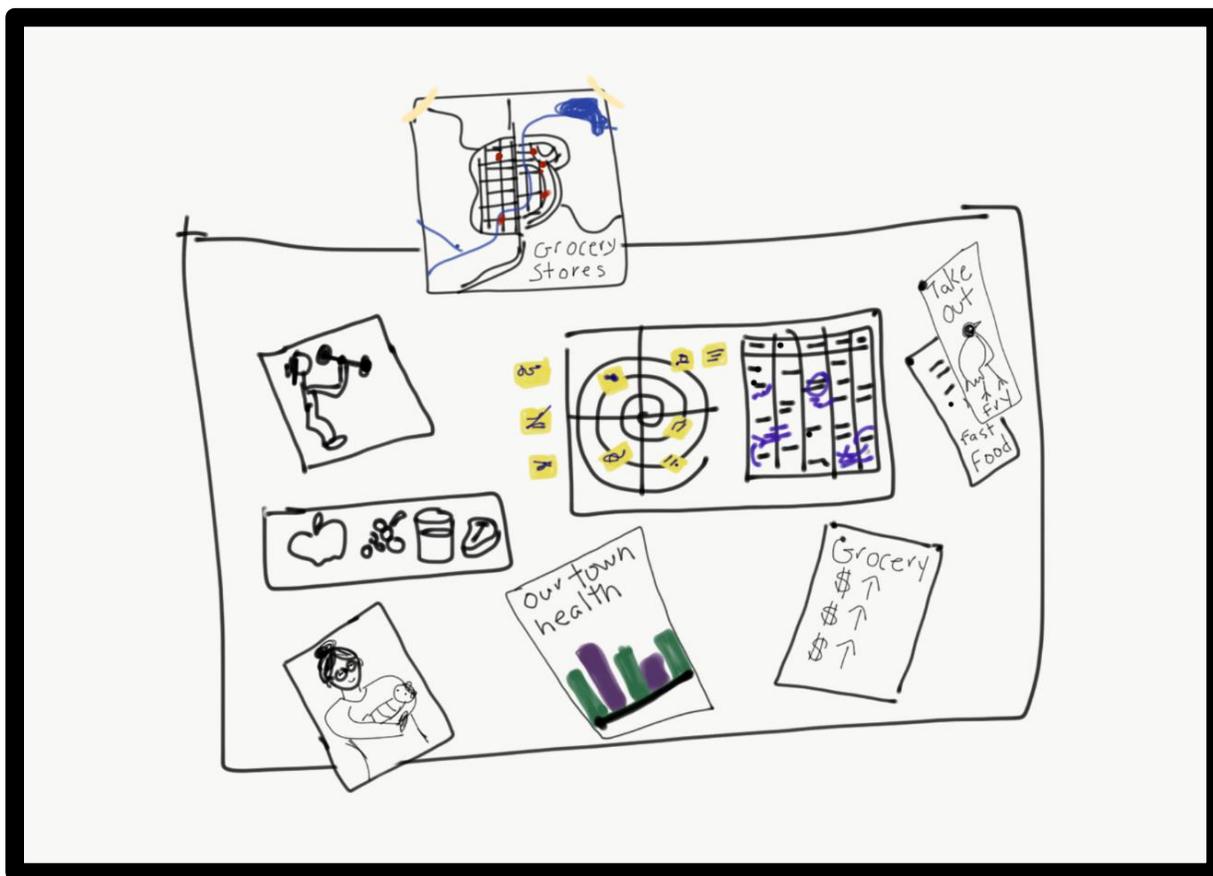
Vanya is a public health educator with the NGO *Live Healthy*. She has recently been tasked with revamping the organization's program for individuals who are having trouble managing their Type Two Diabetes when the existing planner was promoted to a managerial role. This program has been identified for revision because it has not been successful at meeting its stated objectives of better lifestyle and health outcomes for participants. The program is funded to run with 30 participants. Classes run weekly for 12 weeks. A new offering will be starting in two months.

When Vanya reviews the existing curriculum and materials she notes that the focus has been on talking to participants about what diabetes is, its effects on the body, and the risks of unmanaged diabetes. Every week, each learner was given a handout containing a healthy recipe and a recommended exercise. In the past, the course regularly included guest speakers who talked about their success in managing their diabetes through a well-regulated life style. In reviewing the participant evaluations, she sees that a few people commented that they already knew much of the information presented in the program. When she speaks to the instructors they say that they have historically had a hard time engaging learners in discussion with the group because the topics discussed are sensitive and so classes have often been presented primarily in a lecture format.

Early in her planning process, Vanya meets with the instructors, Ilya and Ted, and together they survey Figure 11 – the galaxy spiral for considering program context. They identify specific aspects of context relevant to the program and make notes of the details of their program's particular context in the table. They then use sticky notes to plot relevant aspect of

context on the spiral and put it on the wall of their shared workspace. Over the next weeks as they observe their context spiral on a daily basis it sparks further insights and conversations between Vanya and the instructors about the context of the program. They also start to collect artifacts about aspects of context and create some sketches and put them on their bulletin board with the spiral (Figure 19).

Figure 19: Mayoh-Bauche, 2018. Electronic sketch of a context billboard



This display prompts some of their co-workers to talk about the context of diabetes education in their community and provide insights. One colleague suggests a few clients they may want to speak to who are being referred to the next Diabetes Education program. Eventually, Vanya, Ilya, and Ted have identified three aspects of context that they think are particularly relevant – Economic Context, Social Interaction, and Instructional Situation so they

connect with past program participants, current clients of their organization, and some local experts to explore these elements in more depth.

As the planning for the new program is beginning to get going, Ted meets a diabetes researcher from the local University when they are attending the same fundraising dinner. The researcher is looking into personal genetic and biological factors that impact diabetes treatment, including age, ethnicity, and co-existing medical conditions. She is very interested in the course and agrees to join the planning team for some of their meetings. The planners add the genetic / biological context to their galaxy spiral.

Vanya works with the instructors to explore alternatives to lecture based instruction. She tasks each of the facilitators and herself with researching and creating a plan for the application of a different instructional approach. While Ted protests, as he believes it will be a waste of time to create three different plans for one program which already has an instructional plan, she presses ahead. Once the research is completed, they reconvene to discuss the three alternative plans for the course – one based in experiential learning, an online offering using instructional design principles, and another utilizing a design based approach to learning. Each of them present the strategies, benefits, and challenges of the approach they researched and describe what it would look like in practice for their program. The ensuing planning conversation is not a smooth process. Often the person who has researched a particular strategy argues for its efficacy and advocates for the inclusion of elements of that strategy into the program when the others are not convinced. Ted, who has outlined a possible online program, becomes defensive when the others dismiss the possibility early on in the discussion. Even though he does not necessarily believe it is the best option for the program, he is able to draw out and communicate some insight from instructional design and the flexible distance learning it enables which he thinks

would be beneficial for learners in the program. Throughout these conversations, the planners are able to identify many strategies that they think would be beneficial in the course design going forward. Some possible strategies are contested by one of the planners but favoured by the other two. They collect the ideas, agreed upon by at least two planners, into a “menu” of possible course components to be further evaluated by themselves, the larger planning cohort, and, to some extent, learners as the planning process moves forward.

Vanya then leads the development of an integrated planning cohort who will work collaboratively on developing the new program. In addition to the instructors and herself, Vanya identifies a past participant and two future participants who have significant insight into the program and learner needs and who are eager to be involved. The diabetes researcher also becomes a part time planning team member. Planning meetings are held in a variety of locations including a local café, the researcher’s hospital based workspace, and a lounge area in the *Live Healthy* offices. During an early planning meeting, the planners discuss the Sunflower Spiral (Figure 16). They cut out and sketch pictures of objects which represent their personal strengths in planning and plot them on a large spiral in the instructors' workspace. In reflecting on this spiral, they identify some significant strengths within their group, including organizational, logical thinking, data analytic and research skills, as well as empathy and a strong sense of connection. Some members of the group bring a background in creative and artistic endeavours. The group also identifies traits that are not well developed. Prompted by some challenging questions from Vanya, the facilitators identify that they have often taken a linear, traditional approach to their instruction and have not utilized traits from the intuitive side of the spiral as much as they could. This interaction is uncomfortable and causes some conflict within the group. Ted is defensive about what he perceives to be a personal critique. In response to this, the

medical researcher notes the lack of playfulness in scientific discourse and professional problem solving generally, noting that it is not specific to a person but more of a systematic issue. Vanya introduces the seashell spiral which concerns the principle be playful for group consideration. The group responds by identifying the lack of a playful attitude and skills in using play to elicit creativity and connection within their organization and planning team. The past participant, Linda, volunteers to take the lead on learning more about play and integrating some games into the planning process. Returning to discussion of the sunflower spiral, one of the future participants, Alvin, identifies that he lacks transpersonal awareness and decides to start doing some yoga using YouTube videos. Throughout the planning process, the planners revisit the large sunflower spiral which they created, adding and modifying its contents to reflect the new needs of the program as well as their growth in regards to some of the traits included.

After a few initial meetings, the planning cohort hosts a meeting of members of the last group to complete the program. It is an informal gathering, hosted in the *Live Healthy* lounge space and is promoted as an opportunity to gain feedback for the planners but also as a social event for participants to reconnect. The planning group provides healthy snacks and mocktails. Linda hosts an activity with her former groupmates focused on ascertaining the types of content they would include in a program if they designed one and what worked and did not work for them in the existing program. The activity is designed as a playful interaction in which participants draw and jot notes on small cards that they post on the wall. They are then given a chance to review, connect, and build on each other's feedback, often by adding details to one another's sketches. Once participants are in a playful connected space, they break out into self-formed small groups to share where they are at currently in managing their diabetes. The groups share feedback with the planning team from these small group reflections in whatever manner

they are comfortable. Some invite a planning team member to sit with their group, others debrief to the large group at the end, one group chooses to share some jot notes. From this feedback, the planning team learns that many participants identify stress, hopelessness, a lack of support from family, and a sense that things are out of their control as reasons they are not currently actively managing their diabetes. They also report that they were frustrated when they tried strategies offered in the program but did not see results, even when they worked for others. The past participants mention how happy there are to reconnect and one of them suggests making a Facebook group. Linda asks if she can be a part of the group to share resources from the new offering of the course and to continue to collect their insights for making the program better. Early on in its existence, conversations in the Facebook group suggest that many participants did not find the lecture format of the course engaging.

During the next planning meeting, Alvin mentions that he can relate to the hopelessness expressed by members of the last group. The other future group member, Elise, talks about how she turns to her religious beliefs for comfort when she is struggling with her health and gains hope and motivation. A discussion ensues around the role of personal meaning-making and spiritual context in diabetes care. The planners add the transpersonal context to their context spiral. The planning team then reviews the whirlpool spiral together and consider elements of connection in their program. They decide to start a Facebook group for participants of the course, which starts in four weeks, even though not all the spots have been filled. Alvin begins posting discussion questions in the group. They also plan to connect with community members with expertise in the use of meditation and spiritual practice in the treatment of illness.

Because the planning team has strong organizational skills, including planning experience and experience with this particular program, the group decides that it will not attend

to any formal planning theories that lay out the parts of the planning process. Rather the planning team members decide to continue to attend to the planning spirals in the Spirals Model of Emergent planning. When considering the Romanesco broccoli spiral concerned with iteration, the planners deliberately decide to set the initial conditions for the program but to revisit the reflective planning elements jointly throughout and to allow that to inform further action. In considering the tropical storm spiral focused on disruption, they reflect on what level of structure and direction they will need to incorporate in the program at the beginning and how to balance that with randomness. They decide to structure the program around a project but to allow the learner groups a large degree of autonomy over the project topics and strategies. In terms of resource materials they decide to create a list of readings and videos in four big categories and allow learners to choose a few from each to interact with. The planners decide to keep the resource lists deliberately limited so that many learners will interact with the same resources, ensuring some internal redundancy and varied perspectives on each resource. The planners anticipate that learners may then bring their knowledge back to the group, with all learners who read or viewed a certain resource conducting a discussion about that resource for others to observe. With consideration of strengthening neighbour interactions, the planners decide to have learners work on projects in small groups in order to build strong connections with a sub group within the larger 30 person class. The future course participants suggest that they would be happy to lead some group discussions with other participants to gather feedback around program design and momentum, in order to promote distributed control and facilitate the process of iterative program development. They decide to host “input minutes” for ten minutes at the end of every session. They each host a small group of participants who want to stay and provide input in

a quick discussion regarding how things are going and what direction they would like the course to take. This is a regular time to shift from action to reflection for the larger learner group.

Once the program gets running, the planning team's sunflower spiral is presented to the new group of learners. It is used as a tool to introduce the learners to the planning team, especially the instructors, but also as a prompt for some learning activities. Inspired by the sunflower spiral, learners make concept maps, either by hand or using online mind-mapping tools, which reflect their personal skills, traits, and knowledge relevant to managing their diabetes and to the learning of the group. As a group, the learners determine how they would like to explore their shared skill sets. A few group members who are knitters offer to create a large yarn web for the wall of the learning space and all participants and the instructors bring in objects representing some of their skills which are affixed to the web (Figure 20). As they affix objects to the web participants talk about how it can contribute to the learning of the group.

Figure 20: Mayoh-Bauche, 2018. Photo-collage of personal attribute web



The instructors continue to consider and address varying levels of context throughout the course. They introduce the galaxy spiral to the learning group and discuss the relevant layers of context they had identified. Participants also identify other layers that they think would be helpful to consider. Through this discussion and the planning teams initial research on economic context, the group discovers that many individuals with diabetes in their community struggle to eat healthily because they lack access to grocery stores in the inner city and because fast food is often a more convenient and affordable choice than fresh food. The planning team explores the context of the city further and identifies resources and programs which could help to mitigate these contextual barriers for participants. On one occasion, the group tours a food co-op and community garden located in the inner city. They also share resources regarding grocery delivery services and have a coffee break catered by a local business that offers affordable, healthy meals for pick up as an alternative to fast food.

The planners spiral back to many aspects of planning practice throughout the program. While they set an initial time and location, the instructors discuss these with learners on the first day. The group decides to start slightly earlier in the evening. Later in the program, some groups of learners no longer come to classroom for each session as they find alternate locations that are more conducive to working on their projects, including through online collaboration forums. The instructors shift discussions of readings so that there are class periods that are strictly dedicated to group work to accommodate location changes. Some groups also begin to contribute regularly to the course content. Alvin's group, which focused on mindfulness and yoga, begin regularly leading short yoga sessions at the beginning of class. Another group that has been fascinated by the work of the researcher on the planning team, works together with the researcher to connect other group members with information and plans for diabetes care based on their personal

biological factors. While the projects undertaken by learners were initially meant to be shared within the group, some participants voice the desire to share their learning in order to help others avoid getting diabetes. The instructors work with Vanya to allow groups to host activities for other clients of *Live Healthy*. One group plans a bi-weekly hiking group for *Live Healthy* clients over 50. The facilitators also assist some groups to plan activities in the community more broadly. A group of participants who connected over their shared love of cooking, revealed in the web-exercise, plan a series of healthy cooking activities in a local elementary school, where one of them had previously worked. While the loose structure of aspects of the program is stressful for some group members, the planning team uses periods of reflection and more traditional read and report learning activities to balance the randomness. Periods of reflection also allow learners to process and share their concerns. The small group format allows some groups to stick with comfortable learning activities such as researching and presenting on a topic to their fellow learners.

As the program draws towards completion, the planning team spirals back towards their initial planning activities. While Linda, Elise, and Alvin move on from the planning team, two learners from the program that is drawing to a close join the team to help prepare for the next iteration. On the final evening of class, the group shares a meal and Alvin and Elise lead some game activities to elicit participant feedback to inform future planning. The planning team collects its notes to reflect on what went well and what was challenging in the program and begin to plan the initial conditions of the next offering.

Appendix B

Levels of Context Visual

		Vygotsky (In Davis & Sumara, 2006)	Sork (2000, 2010)	Banathy (1991)	Nelson and Stolterman (2012)	Davis and Sumara (2006)		Relevant Areas of Thought (Adapted from Davis & Sumara, 2006)		
			Planning Domains		Perspective	Nested Knowers	Nested Knowledge	Levels of Phenomena	Discourse	Discipline
Macro	The species		Aesthetic Ethical		Spiritual Transpersonal Ethical			Ecological (Human & Biosphere)	Ecosophy (Ecological Philosophy)	Philosophy Ecology The Arts Complexity
	Cultural context		Socio-Political		Political Economic	Social Collective	Collective Knowledge	Cultural Tools Social Interactions	Cultural Studies Post-structuralism	Anthropology Sociology Linguistics Political Science
Micro	The Individual		Technical	Institutional Administrative	Organizational Technical	Body Brain	Mind Personal Understanding	Bodily Activity / Personal Experience Genetic Structure / Biological Pre-disposition	Phenomenology Analytic Science	Business Education Biology / Medicine Psychology Neurology Genetics Chemistry