

Toward an Integral Approach for Evolving Mindsets for Generative Learning and Timely Action in the Midst of Ambiguity

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Background/Context: *The implications of complexity theory have become a recurring topic in the literatures of a wide range of scholarly and professional fields including adult education. This paper builds on literature calling attention to the educational need for pedagogically addressing the implications of the intensifying complexity in the environments that confront adults in their professional and personal lives.*

Purpose/Objective/Research Question/Focus of Study: *Three theoretical streams, (a) Complex adaptive systems; (b) learning through experience; and, (c) adult developmental theory provide the basis for the pedagogical approach that is presented. The focus is on contingently applying these distinct streams of theory into learning designs. We share our experiences in experimenting with course designs for preparing adult learners for taking action on personal, civic, and professional challenges embedded in ambiguity and uncertainty in which rigid application of ready-made solutions is not possible. Our goal is to stimulate deeper experimentation. Accordingly, the question guiding this paper is, “How can we as adult educators create conditions in our classrooms, and other learning venues, for addressing the need for preparing adults to mindfully learn through the challenges that confront them in the context of increasing complexity?”*

Setting: *For purposes of illustrating our experience and provoking questions, we draw on examples from our work in three graduate level courses in distinct disciplinary settings—specifically, organizational psychology and adult learning, adult education, and technology management.*

Research Design: *This paper is an analytical essay drawing out the implications for generative learning from an integrative literature review connecting the three theoretical streams identified above that guide our thinking and work. We provide a framework for creating generative learning spaces based on the implications drawn from this integrative literature review, along with examples of application.*

Conclusions/Recommendations: *Our experiences in a range of settings suggests that applying the framework can provide educative structures in which adults may stretch their capacity to make meaning, and learn how make choices for timely action, under conditions of uncertainty and ambiguity generated by the complexity their socio-economic environments. The approach also provokes new challenges for faculty as well as students, challenges that require more systemic research. We conclude with an agenda for future research.*

INTRODUCTION

Education has always been a process that enables adults to manage the personal and vocational challenges and opportunities confronting them in their lives as well as facilitating their civic participation in societal concerns (Illeris, 2004; Lindeman, 1961). The learning needs generated by these challenges and opportunities are addressed by a diverse range of education formats, both in higher education institutions as well as community and private sector initiatives. The variety of needs include, among others: a) providing opportunities for members of marginalized segments of the population seeking entry into mainstream society; b) facilitating self-directed learning projects for personal development; and c) sustaining and/or up-grading workplace qualifications, including re-training for new careers as former ones became obsolete or outsourced. Driving a shift toward continuing vocational education as a *necessity* confronting most segments of society, whether or not they desire it (Illeris, 2004), has been the intensification of rapid change, which is, in turn, driven by technological innovation and the socio-cultural shifts it enables (Langer, 2011). Primary among these shifts are continuous connectivity through ever emerging new media and globalization.

Although intensifying, these shifts are not unique to the 21st century. Forty years ago Donald Schön (1973) noted the loss of the stable state, arguing that societal institutions were in continuous processes of transformative change, and people could not expect new stable states to endure throughout their lives. Writing within the context of self-directed learning theory, Candy (1991) argued that “the rapid rate of political, social, and technological change with which we are currently confronted has increased, rather than diminished, the need for self-directed citizens” (p. 20). Ten years later, Taylor (2001, p 3) captured the intensifying experience of these challenges when he observed, “things are changing faster than our ability to comprehend them. ... Awash in a sea of information

that seems to have no meaning and bombarded by images and sounds transmitted by new media, many people have lost a sense of direction and purpose and long for security and stability.” One effect of this intensifying pace of technological innovation has been the increasingly dynamic complexity of the systems in which people are embedded: systemic and interpersonal networks consisting of conflict, interdependence, ambiguity and flux. By end of the first decade of the 21st century, the increasing pace of change and the complexity of connections it brings with it has become a continuous reality in the lives of citizens.

The implications of complexity for both theory and practice have become a recurring topic in the literatures of a wide range of scholarly and professional fields (e.g., Bousquet & Curtis, 2011; Davis & Sumara, 2008; Fenwick, 2003; Lissack, 2002; Morrison, 2006; Osberg & Biesta, 2010; Patton, 2011; Sargut & McGrath, 2011; Stacey, Griffin, & Shaw, 2000). Receiving less attention has been the implications for designing learning settings that prepare adults to function effectively under conditions of complexity as they strive to translate the insights from this literature into practice. This paper seeks to extend and build on the literature that has called attention to the educational need for addressing these implications (e.g., Hase & Davis, 1999; Vaill, 1996), particularly in light of the intensifying complexity in the environments that increasingly confront adults in both their professional and personal lives.

The personal, professional, organizational, and/or societal challenges that emerge from unanticipated changes initiated by new actors, new social connections, and technologies intruding into one’s socio-economic-cultural life space are sometimes difficult to identify early on and easy to initially deny. They challenge existing beliefs and require changes in relationships and roles. However, in the socio-economic world they also open the possibility for creative new initiatives and directions on the part of the learner. Returning to the words of Taylor (2001, p. 3), “While the moment of complexity inevitably generates confusion and uncertainty, today’s social, economic, political, and cultural transformations are also creating possibilities for apprehending ourselves in new ways” (p. 3).

This ever intensifying shift from relative contextual stability to an environment of rapid change with unpredictable outcomes presents adults with the need for preparing themselves for confronting confusing choices as familiar patterns of social interaction are continuously disrupted. The implications extend beyond technical, vocational, and workplace learning. Educated citizens must be aware of how they are in relationship with their environments as they think and engage in public discourse and balance personal lives in a world of interconnected volatility. This learning challenge both includes and goes beyond developing skills and

competencies. In addition to skill and competency, it requires developing a capacity for awareness of how one is in relationship with that world and the ambiguity it presents (Nicolaidis & Yorks, 2008; Yorks & Nicolaidis, 2012; Vaill, 1996). The implications of this challenge are present in choices involving one's career planning and extend to decision-making and actions in the broader life-world of civic and political decisions that confront adults on a regular basis.

Self-directed learners in this context need the capacity for balancing a commitment to unfolding plans and actions while remaining open to the implications and possibilities embedded in the unanticipated consequences that emerge when engaged in taking action. Providing learning experiences that develop an awareness of one's mindset and its impact on one's thinking and acting under conditions of ambiguity and uncertainty is critical.

An explicit premise underlying this paper is that an enhanced *capacity* for engaging in *generative learning through inquiry* is a necessity for participating more effectively in the 21st century. Generative learning involves producing new meaning, insights, perspectives, and knowledge from processes of relating new information and facts to prior knowledge and experience (Wittrock, 1974). The concept is one of the pedagogical foundations for designing learning environments that rest on active meaning making in contrast to instructional models that focus on lecture, memorization, and recitation. Generative learning has been separately adopted as a central concept in the literature on organizational learning in contrast to adaptive learning (Chiva, Grandio, & Alegre, 2010; Fiol & Lyles, 1985; Senge, 1990). In the organization learning literature, adaptive learning is about coping with changes in the environment or adjusting existing practices, policies, products, or services; generative learning is about creating new approaches that are disruptive in terms of innovative change (Christensen, 1997; Christensen, Baumann, Ruggles, & Sadtler, 2006; Senge, 1990). The concept is also central in discussions of strategic thinking as the ability for integrating new information and emerging trends in diverse socio-econ-political sectors with one's experience (Yorks & Nicolaidis, 2012). In this paper generative learning refers to learning that produces outcomes that call into question one's existing theories-in-use (Argyris & Schön, 1975) and is the basis of personally transformative (Mezirow, 1991; 2000) and developmental learning (Drago-Severson, 2004; Kegan, 2000; Torbert, 2004). It is viewed as especially critical when individuals, organizations, and societies are confronted with disruptive environments in which existing assumptions and presuppositions are counter-productive (Chiva, Grandio, & Alegre, 2010).

By an enhanced *capacity* for engaging in *generative learning through inquiry*, we mean having *an immediate awareness of how one is in relationship*

with the ambiguity and uncertain challenges of one's environment while maintaining and continually testing one's actions with one's intentionality. This requires making sense of the range of choices for timely action that confront one in disruptive environments where outcomes cannot be predetermined or predicted with certainty; more specifically, environments characterized by high uncertainty or true ambiguity, in comparison with environments marked by high predictability, or limited uncertainty (Courtney, Kirkland, & Viguerie, 1997). The learning challenges presented by the increasing complexity of the global political-socio-economic environment have implications for generative learning pedagogies, particularly those in the context of higher education and professional development: Specifically, incorporating developmental awareness of how the learner's mindset creates subjective boundaries around his or her use of analytical tools and learning practices as they engage in making meaning under conditions of high levels of uncertainty is an increasingly critical dimension of generative learning pedagogies. Adult development in the sense of how the learners' meaning making capability grow more complex over time (e.g., Basseches, 1984; Commons & Richards, 2002; Kegan, 1982; 1994; Torbert, 2004), as well as developing his or her use of experiential and active learning processes is a necessary goal of generative learning.

As argued by Merriam, Caffarella and Baumgartner (2007), the ever evolving, and as noted above, intensifying societal context marked by complexity and discontinuous change implies that no one theory of adult learning is sufficient. Additionally, no one component of a theory is sufficient; nor is linking two or more theories together to make a meta-theory. There is an increasing need for educative designs that are intentionally focused on raising the awareness of the learner of the nature of the complexity of many of the challenges that are confronting them and the implications of how their mindset influences the ways they are using their experience and prior learning in addressing these challenges.

This paper draws on three theoretical streams: (a) Complex adaptive systems—specifically complex responsive processes theory (Stacey, 2010)—as the contextual framing for enabling the learner to understand the need for reflecting on how they are learning in distinctively different contexts (e.g. those in which there is a high level of predictability, those with limited uncertainty, those with high uncertainty, and those with true ambiguity (Courtney, Kirkland, & Viguerie, 1997); (b) learning how to learn through experience in these distinct contexts; and, (c) adult developmental theory for timely action. Each of these theoretical streams has implications for understanding how learners are in relationship with (a) themselves, (b) others, (c) the socio-economic and cultural fields in which they are embedded, and (d) the processes through which they engage in meaning making

and timely action. Our focus is not adding to these streams *per se* or creating a new theory. Rather, our focus is acting on the implications for practice of contingently applying the three streams into learning designs.

The specific purpose of this paper is to share our experiences in experimenting with course designs intended to meet the learning need discussed above; that is specifically preparing adult learners for taking action on personal, civic, and professional challenges embedded in ambiguity and uncertainty in which rigid application of ready-made solutions is not possible. As Peter Vaill (1996, pp. 68-69) noted close to two decades ago, course designs addressing this need must go beyond students engaging in traditional reading, listening to presentations on concepts, and participating in pre-structured classroom exercises that make a particular point to the learner. Rather, the course designs seek to provide the learner with a self-directed opportunity to creatively explore learning of ideas and relationships in action. Such course designs invoke an exploratory and inventive learning process that is expressive and concerned with “real world” experimentation. Our goal is not to provide a fixed format, but to stimulate deeper experimentation. Accordingly, the question guiding this paper is, “How can we as educators that lead adult learning create conditions in our classrooms and other learning venues for addressing the need for preparing adults to mindfully learn through the challenges that confront them in the context of increasing complexity?”

We begin with an integrative literature review connecting the implications of the three theoretical streams that guide our thinking and work. Next we provide a framework for creating generative learning spaces that draw on and integrate these three streams into generative learning designs, along with examples of application. We conclude with an agenda for future research.

THREE DISTINCT THEORETICAL STREAMS WITH IMPLICATIONS FOR GENERATIVE LEARNING

Complexity, learning how to learn through experience, and adult developmental theory each contributes a rich and distinct stream for creating conditions for educative designs that foster generative learning. In preparing learners to meet challenges characterized by uncertainty and ambiguity through generative learning, educators are challenged to develop educative designs by drawing from the intersecting dimensions of each. Consistent with the arguments of complexity theory, situating the learner in the nexus of ambiguity and possibility, as opposed to seeking “right” answers and “correct” solutions, involves crossing the boundaries of theoretical schools of thought. Once again, we are not suggesting that there is one integrated meta-theoretical framework that supersedes

all others. Preparing learners to meet technical challenges can be best done through specific applications of particular learning theories, as can preparing them for adaptive responses to incremental change. Our focus here is on creating conditions for generative learning that prepare adults for addressing rapidly occurring multifaceted challenges marked by high levels of uncertainty or ambiguity.

LEARNING THROUGH EXPERIENCE IN THE CONTEXT OF COMPLEXITY AND AMBIGUITY

As noted above, the implications of complexity theory has become a topic of interest to a wide range of disciplines, including adult education, organization and management theory and international relations among others. Receiving less attention has been the developmental educative practices of preparing learners to function effectively under conditions of complexity and the resulting ambiguity and uncertainty.

Nonlinear feedback is the defining characteristic of complex adaptive systems, allowing for emergence, self-organization, adaptation, learning and many other concepts synonymous with complexity thinking (Richardson & Tait, 2010, p. 29). As Richardson and Tait write,

It is not just the existence of feedback loops *per se* that leads to complex behavior. These loops must themselves interact with each other. Once we have three or more *interacting* feedback loops (which may be made up from the interactions of many parts), accurately predicting the resulting behavior via standard analytical methods becomes problematic (at best) for most intents and purposes. (p. 29)

One of the sub-streams of complex adaptive systems is complex responsive process theory (Stacey, 2010), which argues that actions in the world stay within the experience of interaction, which produces nothing but further interaction. In other words, the contemporary adult learner is confronted with the necessity of striving to make meaning out of confusing encounters in which one is an embedded actor (Fenwick, 2003). As Fenwick argues, this has implications for our understanding of processes of learning through experience.

Theories of learning through experience are generally depicted as a cycle between taking action and reflecting on the experience and consequences of that action (e.g., D. A. Kolb, 1984; A. Y. Kolb & Kolb, 2005; Jarvis, 2006). Learning is seen in large part to be a function of the depth and critical nature of the reflection process (Schön, 1983).

This emphasis captures one facet of learning from experience, the cycles of acting and reflecting within the broader, taken-for-granted, social

structures in which the actor is situated. There is, however, from the perspective of complex responsive process theory, an inherent conundrum in this emphasis on the continuity dimension of experience. For example, Yanow and Tsoukas (2009) describe how the process of reflection-in-action ranges from absorbed coping to more deliberative and analytical improvisation as a function of the degree of surprise or shock generated by the discrepancy between one's expectations and in-the-moment experience. Of relevance here is the notion of conformity to a practice and the application of a repertoire of mastered practices and theoretical frameworks to surprises within that practice. The focus is again on drawing on past experience to respond to surprise, with an underlying assumption of a degree of bounded predictability. Such a posture is useful for adaptive responses in the mist of relatively routine practice. The increasingly complex socio-economic lifeworld is one of porous and changing boundaries. Under conditions of complexity, experience is a double-edged sword, providing a basis for action while also potentially blocking awareness of real time responses and inhibiting insight into possibilities. Building on insights from Orr (1996) and Tsoukas and Hatch (2001), under these conditions past-derived knowledge through experience is not very useful when it comes to examining an emerging surprise in the world of taking practical action. In short, the problem is anticipating a future response even while the conditions themselves are changing.

Increasingly, complexity has been given more visibility in evolving theories of learning through experience (Boulton & Allen, 2007; Nicolaides & Yorks, 2007; Tsoukas & Hatch, 2001). Actors learn through being embedded *in* the experience (Fenwick, 2003). Fenwick in particular explicitly calls attention to the implications of complexity for theories of learning through experience, recognizing the holistic embodied aspects of learning occurring within action. Challenging the mentalist focus of the learner reflecting cognitively on the object of their learning, she writes,

The difference here from mentalist or reflection-dependent understandings of experiential learning is accepting the moment of experiential learning as occurring *within* action, with and among bodies. An embodied approach understands the sensual body as a site of learning itself, rather than as a raw producer of data that the mind will fashion into knowledge formations. (p. 129)

Adopting Schön's terminology, responding to complex, emergent surprises that present a new macro level context, or seeking to change the context ahead of other actors in the environment, requires a continual expectation of surprise, with simultaneous in-the-moment improvisation. Such challenges require synthesis across emerging patterns and

uncertainties along with on-going *reflection-on-possible actions*. In a world of intensifying complexity, how one is in relationship with ambiguity is a critical factor, for ambiguity is what one confronts in making choices for which the impact cannot be determined with any degree of certainty. Indeed, the impact of actions will provoke new, unanticipated, emergent responses from the environment. Under conditions of complexity, learning requires a posture of holistic embedded awareness, continuous inquiry and reflexivity (Alverson & Sköldbberg, 2004) as one navigates through the generative challenges of ambiguity. This requires, we argue below, a capacity for simultaneously holding an awareness of one's somatic, affective, and cognitively embedded being with a posture of reflexivity.

Under conditions of complexity, the utility of one's "reflection-on-possible actions" is bounded by the richness of the range of insights in terms of emergent possibilities. To be clear, this point is not devaluing the importance of expertise, only pointing out the potential limitations it can create for dealing with complexity in terms of generating provocative insight and continual reframing. In other words, an effective epistemic relationship with ambiguity requires a cognitive relationship with the strengths and limitations of what will be described below as expert and achiever mindsets. These mindsets bind one's capacity for experiencing what Bateson (1972) called "Deutero Learning": learning how to learn. Complex responsive process theory reframes learning from experience, re-contextualizing the actor as holistically embedded *in* the system, not acting *on* the system (Fenwick, 2003; Shaw, 2002; Stacey, 2010). At the same time, a capacity for adopting a posture of reflexively considering the consequences of *their* actions in the system needs to be fostered (Alverson & Sköldbberg, 2004). Under such conditions considering innovative options, improvising, and seeking new insight, not following rule bound paths, is the required posture: How the learner engages in utilizing learning practices and learning through experience, and the scope of innovative insight that is generated, is shaped by another dimension of the learning process, one that is articulated in theories of adult development.

ADULT DEVELOPMENT AND ACTION LOGICS

As with theories of learning through experience, there is a diverse set of theoretical frameworks in the field of psychological, moral development, and self-development (e.g., Basseches, 1984; Commons & Richards, 2002; Erikson, 1963; Fowler, 1981; Gilligan, 1982; Kegan, 1982, 1994; Kohlberg, 1971; Loevinger, 1976; Torbert, 2004; Vaillant, 1977). The two frameworks relevant to our current argument are Kegan's (1982) constructive developmental theory (CDT) and Torbert's (1999, 2004; Torbert & Livne-Tarandach, 2009) developmental action inquiry (DAI).

Constructive developmental theory is constructive in the sense that it focuses on the nature of the meaning a person constructs from their experience and is developmental in the sense that it seeks to understand how these meanings grow more complex over time (McCauley, Drath, Palus, O’Conner, & Baker, 2006). At the core of these processes is the dynamic through which the subjective principles, which shape how a person makes meaning of his or her experience, become part of their objective awareness and can be reflected upon. This process of the subjective way of knowing becoming something that can be reflected upon results in the emergence of a more complex way of making meaning while expanding one’s capacity to enact within that complexity. This more complex way of making meaning develops the capacity to learn how to learn through experiencing the complexity of life (Nicolaidis & Yorks, 2008).

Torbert’s (2004) work on developmental action inquiry (DAI) theorizes the processes through which people engage in inquiry while taking action, shedding light on the nature of our moment-to-moment participation with others and the larger system in which we are embedded. Intersecting in ways parallel with Kegan’s theory (1982, 1994), Torbert describes a developmental sequence of eight action logics, six of which are highlighted in table 1.

Table 1 offers a high level view of the developmental stages and action logics. The main purpose for offering a concise view of Kegan’s developmental stages and Torbert’s action logics is that together they describe the developmental dimension of mindsets. This developmental dimension, we argue, is essential to educative designs intended to foster awareness of how one is in relationship with the ambiguity of complex challenges. Developmental capacity is at the center of cultivating a mindset for generative learning through complexity. Action logics are mindsets that reflect one’s capacity to make meaning of the demands placed on them within complex contexts. They shape how one makes meaning of ambiguity and acts.

An essential feature of developing mindset capacity is engaging in inquiry that fosters *interdependence* at the individual, group, and system levels: first-person inquiry (awareness of one’s own intentions, strategies, and sensed performance); second-person inquiry (building inquiry into one’s interactions with others through mindful use of speech); and third-person inquiry (awareness of the larger system and the assumptions it shapes through the data that it provides) (Fisher, Rooke, & Torbert, 2003; Torbert, 2004). These three levels of inquiry place emphasis on experience that is simultaneously intrapersonal, interpersonal, and social. Simultaneous awareness of the intrapersonal, interpersonal, and social has relevance for Fenwick’s (2003) description of embodied learning in the collective

Table 1. Comparison of Kegan's and Torbert's Developmental Frameworks

Framework	Dependent		Independent		Interdependent (Post Conventional)	
1) Kegan:	<i>Stage 3: Interpersonal</i>		<i>Stage 4: Institutional</i>		<i>Stage 5: Interindividual</i>	
Objective Awareness:	Needs and dispositions		Interpersonal relationships		The autonomous self	
Subjective Meaning Making:	Interpersonal relationships		The autonomous self		The transforming self	
2) Torbert:	<i>Diplomat</i>	<i>Expert</i>	<i>Achiever</i>	<i>Individualist</i>	<i>Strategist</i>	<i>Alchemist</i>
Action Logic:	Norms rule needs	Craft logic rules norms	System Effectiveness rules craft logic	Relativism rules single system	Most valuable principles rule relativism	Deep processes and inter-systemic evolution rule principles
Main Focus:	Socially expected behavior, approval	Expertise, procedure, efficiency	Delivery of results, effectiveness, success in system	Self in relationship to system; interaction	Linking theory and principles with practice dynamic, systems interactions	Interplay of awareness, thought, action, and effects; transforming self and others

Note. Adapted from McCauley, Drath, Pauls, O'Conner, & Baker (2006).

shared experience of the learner. With the changing nature of complex environments, what stretches current principles of learning from experience is that awareness of, and presence to, these simultaneous dynamic conditions, which are required for innovative responses to the challenges that confront learners. The intersection of constructive developmental theory and developmental action inquiry deepens our understanding of the processes of learning how to learn from experience.

The implications of a conceptualization of one's self as an embedded actor (Fenwick, 2003) is the need for awareness of learning as a process of striving for critical subjectivity among one's own complex ways of knowing (Heron & Reason, 1997). This includes, bringing pre-linguistic tacit experience into consciousness through use of various expressive ways of knowing (Yorks & Kasl, 2006), the cognitive propositional meaning one makes of this experience, and the practical actions being taken. This critical subjectivity is described by Torbert as first-person inquiry (2004).

Additionally, learning under conditions of complexity requires continually engaging in what Torbert (2004) calls second-person inquiry (seeking critical intersubjectivity with others in the system) and third-person inquiry (feedback from the broader system one is acting in). Habits of engaging in Developmental Action Inquiry through first person, second person, and third person inquiry purposefully brings embodied experiential learning into awareness as one continuously challenges and reframes the meaning and courses of action being adopted. Far from negating the value of cognitive reflection, this requires engaging in processes of reflexivity (Alverson & Sköldberg, 2004); awareness of *how* one is learning (Bateson, 1972) and learning how to learn through the experience of ambiguity and uncertainty (Nicholaides & Yorks, 2008).

Although each of the three streams discussed above represents an academically distinct theoretical discourse, in practice they are continually interacting as multiple feedback loops within the learner (and as will also be discussed below, within the educator as well). Highly fluid complex challenges have not created this complexity. Rather, they only make it more difficult to ignore. One's capacity for reflecting on one's learning process is, in part, a function of their action logic. This, in turn, shapes the range of insights and potential innovative actions.

We now turn to discussing the implications of the above arguments for educative designs in practice. In making the transition, we share the reflective comments of a student in one of our classes that capture the lived experience of one such design. She came to class with a fixed professional demeanor, working for one of the top innovators in executive education. Her struggles in class led to a meaningful and fruitful developmental move in her professional and personal way of being. When she began class, she prided herself on her single-pointed, linear, self-directed, and motivated way of tackling her learning, as if to win a race. She discovered that in her push to know, she was missing the potential for innovative resolutions and opportunities over and over again because she had not yet imagined them possible. She engaged with the numerous reflexive experiments we invite all students to engage with and made a transformative move in her capacity for generative learning. Here is how she described this new learning:

Innately, I am a linear thinker but through this class, I had to learn how to engage in more spiral, paradoxical thinking. . . . I had to learn how to be in relationship with the unpredictable and uncertain realities of strategy making. . . . How to feel empowered by ambiguity that I resisted and was negatively affected by even halfway through the course. It was only after much struggle that I experienced a shift in my mindset, and I still have a way to go in learning how to apply this new mindset to my work and life.

From her experience of learning through the process of becoming aware of a previously unexamined way of knowing and acting, she takes up the process of learning anew how she knows and what that means for her repertoire of timely action. What follows is a deeper discussion of our educative design and some of the implications for generative learning.

DEVELOPING EDUCATIVE DESIGNS FOR GENERATIVE LEARNING

The question driving this paper has to do with the implications that the above connections among these distinct streams of theory hold for practice. Taken together, they provide the foundation for educative designs preparing learners to learn through complex challenges characterized by uncertainty and ambiguity of a personal, vocational, or civic nature. Creating these designs for facilitating generative learning involves choosing relevant learning practices related to each of the theoretical streams, which, in turn, entails recognizing how each interpenetrates and potentially complements the other.

The interconnectedness of these three theoretical streams is foundational for three properties of educative designs for generative learning:

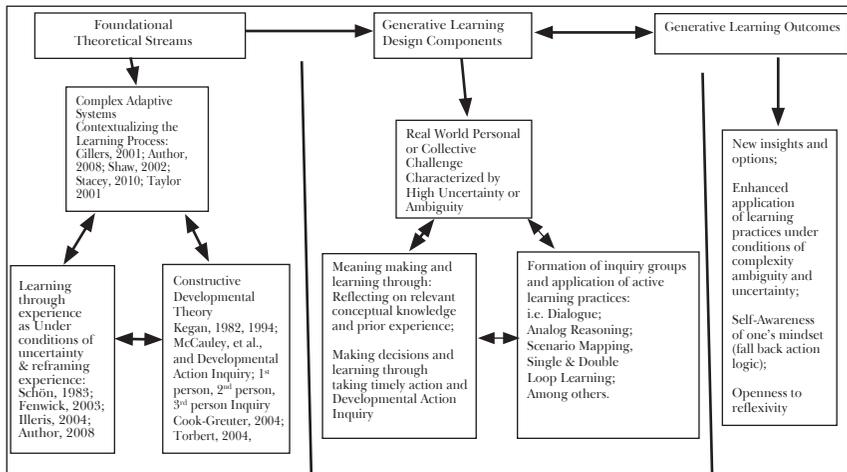
- Inquiry in action – incorporating action inquiry groups into the design, focusing on actual ambiguous challenges that are confronting the learners.
- Reflexive meaning making – These inquiry groups engage in dialogue directed toward making their meaning making process explicit through first-, second-, and third-person inquiry. This inquiry process heightens awareness of both assumptions brought forward from past experiences and the preferred action logics of the learners as they are reframing and acting on their challenges;
- Timely action – using action inquiry and reflexive meaning making for taking the most effective actions, while remaining open to the unexpected surprises that emerge.

Generative learning is simultaneously practical, reflexive, and timely, essentially describing a process of *learning how to learn through*. Figure 1 depicts the interconnections of these three theoretical streams and their contribution to educative designs that create conditions for generative learning.

AN EDUCATIVE DESIGN FRAMEWORK FOR GENERATIVE LEARNING

Drawing on the implications of the above literature review and insights from colleagues at various academic conferences on complexity and learning, for the past six years the authors have been exploring the

Figure 1. Conceptual model for generative learning designs for preparing learners for learning under conditions of complexity



implications of applying the above framework to create generative learning spaces in a range of contexts. Such contexts include a strategic learning class for organizational psychology and adult learning students, a course in strategic advocacy in an Executive Master of Science program in Technology Management, a doctoral class for adult education students in program development, and workshops at professional conferences. All the learning settings have involved adults seeking advancement in their skills and enhancement of their knowledge base while confronted with the ambiguity inherent in the complex challenges of their personal, professional, and/or civic roles. For purposes of illustration, we draw on examples from our work in three graduate level courses in distinct disciplinary settings—specifically, organizational psychology and adult learning, adult education, and technology management. These examples are for illustrating pieces of our experience and provoking questions, not confirmation of the validity of either the framework or the practice.

The educational designs involve inclusive cycles of inquiry and reflection, with practical instructional experiences relevant to the academic content of the course (e.g., strategic learning and strategy development; program development). The objective of these designs is to transcend the conventional focus of increasing the fund of the learner’s knowledge and includes the awareness and initial development of their meaning making capacity. The intention of the educator is to bring into the classroom the lived realities of the learner’s daily experiences together with

the processes of learning how to learn through experience. In effect, the subject matter becomes foundationally grounding while generative learning processes emerge and are fore-grounded.

We hasten to note that some learners are confounded by an educative design that places them in the center of their learning by making them the subject of their learning. One student described this realization in an adult education course as “being duped.” Despite being a student in an adult education program that regularly discusses the distinctions between “banking” and emancipatory and participatory learning (Freire, 2005), the student expressed his concern as follows: “are you saying that it is my role to learn how to learn from you by learning how I learn from myself ... you mean to say that your role is not to teach me what to learn?” (Student, Fall 2010). This captures the distinction between discussing the concept of learning vs. living it through action under conditions of uncertainty.

Our applications of explicitly drawing from the three literature streams have been exploratory and were taken from a posture of design (Ulrich, 1987) involving reflection-in and on-action, on our part, and with our graduate assistants. Although contextually adapted, the early class sessions frame the intention of the course, interspersing a focus on the relevant subject matter literature with classes, and introducing the implications of complexity, inquiry, meaning-making, and learning practices. During this period of time, the relevant theoretical frameworks are presented, compared, and discussed in terms of their relevance for taking action in the world. A recurring distinction is made during these discussions between expert problem solving thinking that has a “right answer,” and challenges marked by uncertainty and complex, unpredictable responses in the environment.

Following these foundational classes students write up a complex challenge related to the subject matter (the challenge might be organizational or personal) currently confronting them. This write up provides them with “data” on their subjective first-person meaning making and is the foundation for first-person knowing on the challenge as they proceed throughout the class, as well, as a basis for reflexivity on their action logic. They are organized into small inquiry groups to share their personal cases. The inquiry groups provide the space for collective second-person learning, and raising awareness of the members’ action logics. This takes place as the remainder of the course involves incorporating various theoretical and learning practices into their group discussions. For example, one class will involve a detailed presentation and class discussion of a theory or learning practice with the next class devoted to group discussions that utilize the content of the prior class to the challenges of members in the group. In each case, emphasis is on applying inquiry tools against misuse of the

content for validating preferred solutions and safeguarding against untested advocacy. Repeatedly, they inquire into their first-person experience, second-person collective learning, and third-person impact on the broader context of their challenge as they begin to take actions. Learning practices such as dialogue, analog reasoning, mapping scenarios, and double loop learning are sequenced to move the conversation from divergent to convergent thinking, decision-making, and action.

The courses typically end with an integrative reflection session on the learning experienced and on intended future actions and transfer of the learning. These iterations involve an application of the three proprieties of design highlighted in Figure 1 in a very fluid manner. While the above describes design components in the context of classes, the same framework has guided applications in other contexts, including professional development workshops.

ILLUSTRATIONS FROM THE FIELD

One example of the types of learning that emerge through this generative learning approach is embedded in the comment by a student in one of the strategic learning classes. This student had experienced success with her strategic planning initiatives at work and had risen very fast as a “superstar” in her organization. In the habit of knowing what to do and how to do it, the student was seeking ways to improve (the italicized text has been added to more specifically illustrate the connection with the framework):

What surprised me was that I could see that my preferred habit of mind was to work alone to come up with a right answer and apply it stealthily (*first-person way of knowing*): A skills set that got me only so far in my career as organizational consultant. My collaborative learning group offered me the greatest insight—that my skills increased exponentially when I open myself to learning with and from others. Our dialogues helped me step back and pause while developing strategic insights that led me to reframe my challenge (*second-person collective knowing and mutual understanding*). In fact, the reframe was not a particular right answer or approach, rather it was that it was time to cultivate a comfort level with not having “right” answers. I was able ... to see that my life, work and ambitions were not in alignment and saw them at first running on one track back and forth through each other but not in relationship to each other (*third-person objective analysis*). I came up with a new strategic approach (*first-person reframing and second-person collective inquiry*) ... freeing me from the fear that I

had to have a right answer to every strategic concern (*first-person integration of reframed way of knowing with third-person systemic effectiveness*).

The comment above illustrates how a very competent student, eager to increase her fund of knowledge by learning new strategies to augment an already robust tool kit of interventions, learns how to unlearn the need to know the “best” answer. Having both the space to generate the insight with the support of inquiry group peers as well as the willingness to apply the insight to action illustrates the subtle and yet timely learning that this approach potentially generates.

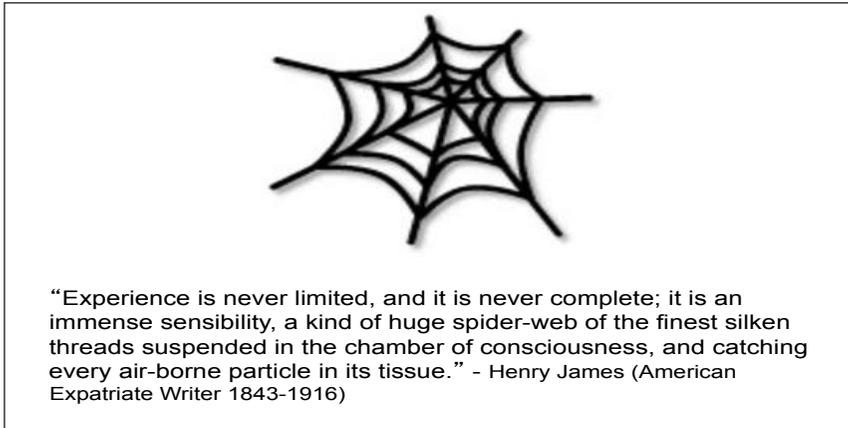
Another example illustrating the progression from first-person through third-person insight can be drawn from one of the in-class action inquiry groups in a program development course. The students were struggling to hold and apply the distinct and yet interconnected parts of this design approach to program planning and development. In one class activity students were asked to take a set of readings that cut across the three theoretical streams we have been describing and present their collective understanding to the other members of the course. Using expressive ways of knowing (Yorks & Kasl, 2006) in a way that integrated first-person subjective meaning with second-person collective knowing, they developed the metaphor of a spider’s web as a strong container for their meaning. They saw the web as a unique structure that reflected the paradoxical intersections for generative learning as “never complete” (second-person mutual understanding).

Describing their metaphor as the “web of inclusion” capturing the movements of learning how to learn through experience, they then proceeded to develop a more cognitive model of how they experienced the processes of generative learning (Figure 3).

Building on the metaphor of the web, this group of students developed a process and evaluation tool with which to evaluate a program planning and development approach. Each circle in Figure 3 represents one area for attention in the approach to collaborative emergent program planning and development they explored. Emergence was a term they used to describe the types of insights that spontaneously arose through inquiry and meaning making, both at the individual and collective levels.

These two figures capture both the process of making meaning of the three distinct theoretical literature streams and the spirit of bringing individual and collective intentions to the generative learning process. The results were that these students were able to communicate to a community exploring ways to develop programs that linked retired faculty, current students, and real needs in the community to generate timely actions for their mutual benefit. The web and the model became tools

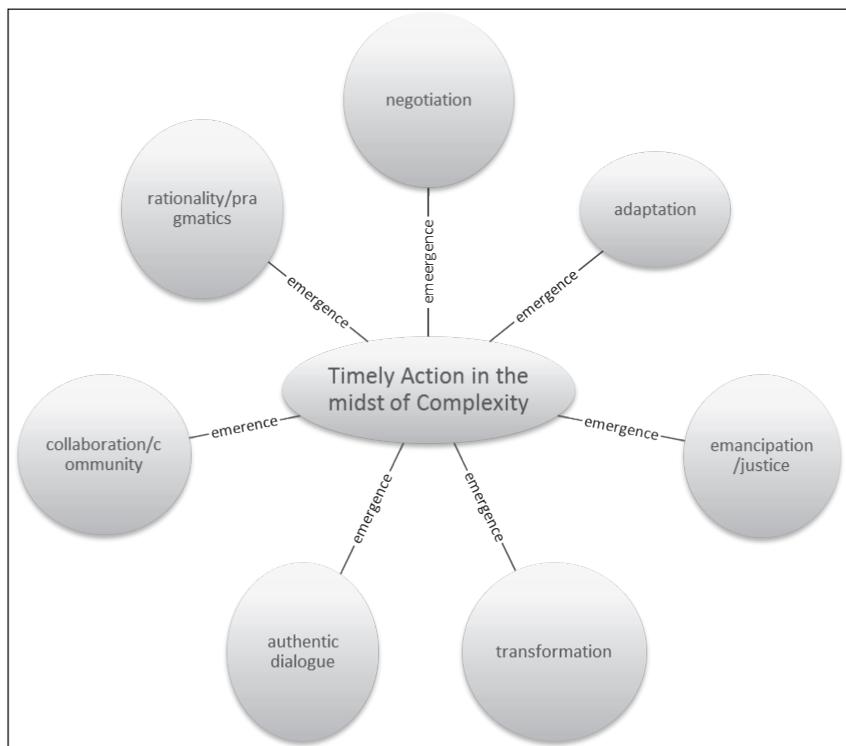
Figure 2. Student metaphor for mutual learning



for talking that paved the way for authentic dialogue across generational divisions, community concerns, and students’ desire to put into practice the theories of program planning and development. One of the feedback comments a retired faculty member gave to this student group follows:

I used to teach service learning. My students and I would identify a community need, do a need’s assessment, head back to our classroom and come up with a plan, go back to the community and implement our plan. We were successful but we missed the opportunity to grow together with our community, to understand beyond a problem solving approach filled with good intentions. We missed the potential for collectively growing with each other while transforming both ourselves and the problem. (*Third-person system effectiveness*)

It is important to note here that the designs described above apply to the faculty as well as the learners. Faculty must model the educative assumptions of uncertainty undergirding the design by recognizing that they, too, are embedded in the learning process. Within the general framework of the design, the learning space is emergent, not controlled or replicated. The faculty are neither “sages on the stage” or “guides on the side” to employ the popular euphemisms. To be more concrete, when a student challenges a faculty member’s theoretical posture, the faculty members’ response can’t be to reclaim his or her power position of being the authority at the front of the room. Nor can one deliberately adopt the posture of the most prominent position relative to other facilitators; or, as in the case of one of the authors whose fall back position is

Figure 3. Model for timely action and mutual learning processes

to draw on years of experience in executive education, rely on engaged “entertainment” (a very descriptive term coined by Nancy Dixon during discussions at an Academy of Human Resource Development Meeting) when working through the power points. Rather, it involves an ongoing balance of drawing on one’s expertise while recognizing the limitations of one’s expertise and building on the insights and expertise of the learners. As noted above the interacting feedback loops within and among all the participants need to be incorporated into a learning system that is bounded, yet emergent. Instructors must be prepared to engage in inquiry-in-action and reflexive meaning making that is being asked of the students.

IMPLICATIONS FOR FUTURE RESEARCH

Through our explorations integrating practices informed by complex adaptive systems theory, learning through experience, and adult development constructs (Constructive Developmental Theory & Developmental

Action Inquiry) we have created generative learning environments for our students. The examples presented throughout this paper illustrate the range of experiences of the generative learning approach depicted in our model for educative designs for generative learning. As adult educators we are cautious about making any generalizable statements. Yet our experiences in a range of settings suggests that our approach to developing conditions for generative learning provides a context through which adults may stretch their capacity to make meaning, and learn how to make choices for timely action. This, as we argued above, is an important learning objective for both professional and civic action. However, the approach also provokes new challenges for faculty as well as students, challenges that require more systemic research utilizing both quasi-experimental designs, and more systematic field research approaches.

Our experience raises a number of questions that we, along with colleagues, are exploring. For example, we have observed that the extent to which the learner's hope for transitioning from a fairly bounded support or operational role, to one requiring that they work more cross-functionally with an emphasis on innovation, tends to motivate more inquiry on their part into how their action logics have been shaping the way they address various complex challenges. This is not to say that they immediately embrace the experience of the class, but that new personal realizations and a richer set of insights are more likely to emerge. Additionally, we have some experience with how the learner has been socialized in terms of how their broader professional field potentially impacts their response to the design. For example, whether the field in general or the particular curriculum in an institution has a stronger content or process orientation potentially impacts the specifics of how the design is positioned. Beyond professional development, we have observed similar tendencies in learners embedded in cultural transitions. The above suggests a number of questions, including

- How does the positioning of the learner in terms of their career trajectory influence their experience of generative learning designs and also, what is learned?
- In what ways does the larger educational context of the learner shape their experience of generative learning designs?
- How does diversity of experience manifest itself in the learning process of generative learning design?
- How sustainable is the learning from such designs following completion of the learning experience?

In addition, there are questions related to the framework itself. The model as presented is essentially a set of heuristic parameters for design. Research can provide a much more defined set of heuristic guidelines. Among the questions that need to be addressed are:

- How does the theoretical subject matter impact on the design?
- What are the characteristics and or purposes of the subject matter that are most appropriate for application of the generative learning design model? How do these designs manifest differently, and what patterns emerge from these variations?
- What tensions do various instructors experience while implementing the generative learning design?
- What strategies do the learners employ in responding to their challenges?
- What lessons can be learned from the impacts of these strategies?”

Exploring such questions requires contextually framed comparative case studies involving interviews, focus groups, content analysis of course products, observation, and post program discussions, along with a robust phenomenological methodology. Like life itself, such research is at times messy, but thick description and cross case analysis over time can lead to new insights.

Our argument is testable through quasi-experimental research projects. We would, for example, hypothesize that enhanced learner mindsets results in a wider range of possible actions under conditions of ambiguity, than is the case of increased competence in using learning practices per se. This proposition can be examined more systematically by assessing the primary mindset of a group of learners using the SCTi/LDP sentence completion test (pre and post course), and then systematically assessing the insights produced regarding their learning projects. Variations in the design over time will need to be documented.

A closely related hypothesis is associated with the subject matter focus of a learning experience that explicitly addresses inherent uncertainty—for example, a strategy course in a Business School intended to teach strategic thinking. This would involve a comparison of two sections of a strategy course in a Business School with the same instructor—one section incorporating the design and another not. As with the previous example, pre and post course assessments of the mindsets using the SCTi/LDP correlated with outcomes on a strategic mindset inventory (Scully, 2007) will measure the impact more concretely. Like most real life field research projects, the results will require rigorous attention to the nuance in the process and outcomes, preferably by devil’s advocates.

Such research can provide more guidance to educators seeking to better enable learners to be aware, as well as stimulate ongoing collaborations. Although our focus is on contributions to practice, we also believe it will enhance our theoretical frameworks long term.

SUMMARY

We have been selectively adapting the integration of the three theory streams into other course settings. Colleagues in other universities have expressed interest in these course designs, and we are forging collaborative efforts. Our hope is to stimulate additional conversations with other educators who are working with complexity, learning how we learn through experience, and adult development.

Finally, we, like our students, cannot escape from a complex reality driven by a volatility of rapid change on multiple levels of systems and society. Our personal, family, organizational, community, national, and international boundaries are not fixed. Differences in the form of immigration, population shifts, and approaches to civic participation are fluid and require constant adaptation. Adults want and need to learn their way through inquiry and shift from a performance commodity of learning as a way of participation and inclusion in a global economy. As educators, we seek to generate the conditions for our students to learn, grow, and develop the capacities to participate in a democracy of mutual flourishing. We believe that educative designs that integrate these streams of theory offer that potential.

We are aware that our generative learning approach is consistent with practices of developing critical thinking (Brookfield, 1987) and transformative learning (Mezirow, 1991, 2000). Indeed, our own professional development is rooted in these educational approaches. We see our current work as extending, not replacing them. What is unique to the classes referenced above is the integration of the three streams, an integration that is more explicitly focused on bringing together distinct themes in transformative learning theory: Specifically cognitive meaning frames (Mezirow, 2000), one's way of knowing, (Drago-Severson, 2004; Kegan, 1994) and the affective experience of one's habit of being in relationship (Kasl & Yorks, 2002). We have come to see the generative learning framework described above as providing the scaffolding for creating what elsewhere has been described as a liberating structure (Fisher et al., 2003), a generative learning space (Yorks, 2005), or a holding environment in the classroom (Drago-Severson, 2004). We believe this kind of space will be necessary for preparing students to meet the challenges inherent in the "moment of complexity" (Taylor, 2001). As noted in the introduction of this paper, in 1973 Donald Schön took as his starting

point the loss of the stable state. Our reality today is considerably intensified in terms of complexity; we need educative designs that correspond to this reality.

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