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Towards a Model of Connectedness in Personal Learning Networks

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Abstract

The purpose of this post-intentional phenomenological research study was to better understand connectedness in personal learning networks. The study was situated within the context of the field of learning design and technologies, and more specifically in distance learning. The conceptual framework comprised of theories of motivation, learning, and identity. The philosophical commitments of this study adhered to a phenomenological philosophy of technology and a post-intentional phenomenological philosophy and methodology. The aim of this interpretivist inquiry was to explore the question, how might connectedness take shape in personal learning networks? Six doctoral students participated in three phases of data gathering that included written lived experience descriptions, think-aloud observations, and in-depth interviews. A post-intentional methodology that included a whole-parts-whole process, a post-reflexive journal, and a post-intentional data analysis technique of chasing lines of flight was used to analyze and interpret the data, as well as interrogate the tentative manifestations. The findings included connectedness as motivation, learning, and identity.

Most Internet users are familiar with the multi-dimensional, rhizomatic experience of web surfing in which users follow their curiosity in a never-ending labyrinth of information, entertainment, and communication. The affordances of the web for learning have been leveraged since the early nineties. Nearly 30 years of growth in Internet technologies and web access have brought many new applications for learning. While learning management systems ascend, mature, and decline, the field continues to research and advance pedagogies to take advantage of new technological affordances. One area of expansion includes personal learning networks defined by Couros (2010) as "the sum of all social capital and connections that result in the development and facilitation of a personal learning environment" (p. 139). Martindale and Dowdy (2010) defined a personal learning environment as "a combination of devices, applications, and services within what may be thought of as the practice of personal learning using technology" (p. 180). They explained that the concept of personal learning environments grew out of discontent with institutionally-focused learning management systems that tracked and managed learners, the desire for a more learner-centered approach, and the recognition of the importance of lifelong learning. They described how learners worked independently to gather, filter, and organize content to make meaning while also sharing content and their viewpoints through social software and web applications.

Core to fostering a personal learning network is the ability to see and harness affordances of the social web for learning and to cultivate openness to the intrinsic motivation of curiosity. The past few years have seen significant growth in trends that point to growth for connected and networked learning: (1) the growing ubiquity of social media; (2) the integration of online, hybrid, and collaborative learning; (3) the shift from students as consumers to students as creators; and (4) the evolution of online learning (Johnson, Becker, Estrada, & Freeman, 2014). Learning through connected networks heralds a powerful bridge between formal and informal learning (Anderson, 2010, 2012), which could impact higher education classrooms—online and on campus. The transfer of knowledge and skills to workplace performance and lifelong learning are some of the potential outcomes of integrating networked learning into higher education, in which learners maintain access to people, resources, and environments after graduation.

In a discussion of bridging formal and informal learning, Rossett and Hoffman (2012) described the nature of the informal learning experience as "vivid, emotional, unexpected, and idiosyncratic… real, often social and essentially engaging" (p. 170). They explained that most informal learning emanated from an individual or small group who took an active role in the learning process, which might be facilitated by a guide or guided by the design of the experience. In the direction of pedagogically operationalizing the formal-informal learning bridge, Dabbagh and Kitsantas (2012) proposed a three-level framework to harness social media for self-regulated learning through the use of personal learning networks. In a get-connect-grow process, the instructor begins by scaffolding students' use of social media to help them form personal learning environments and begin to manage personal information. Next is a guided focus on the social aspects of sharing information and collaborating through activities afforded by social media. Finally, learners are taught ways to customize personal learning networks by synthesizing and aggregating information for reflection and personal growth.

Given developments of open educational resources, social media, social networking, and mobile learning, Conrad (2014) found that traditional understandings of formal and informal learning were no longer clearly delineated and that the two learning styles were merging in new ways. She described a research stream at the intersection of relationship-based interactions, social presence, and the social learning theories of Bandura (1986) and Vygotsky (1978), as well as adult learning theory (Knowles, Holton, & Swanson, 2005). Positioning her study of interaction in the context of online learning communities, she drew connections to Wenger's (1998) work on communities of practice as well as Garrison, Anderson, and Archer's (2000) theory of Community of Inquiry that included social presence, teaching presence, and cognitive presence (Conrad, 2014). Campbell and Schwier (2014) recognized "dynamic social and informal learning" (p. 366) cropped up from social media and communication applications. They believed, "opening online learning environments to incorporate informal and diverse social learning spaces offers fresh opportunities to instructional designers, and also challenges the dominant discourse of what is considered 'legitimate' learning, based on institutional control of accreditation and certification" (p. 366).

The affordances of social web technologies point to the potential for personal learning networks to not only bridge formal and informal learning, but also to foster meaningful, lasting connections. Learning that extends beyond formal contexts might also have implications for the transfer of knowledge. Learners may be aided in the transition to workplace environments with the extended support from colleagues and experiences in communities of practice (Lave, 1991; Lave & Wenger, 1991; Wenger, 1998) as part of personal learning networks.

Conceptual Framework

Connectedness could not be meaningfully interpreted with reference to only one theory. Therefore, this generative-inductive research called for a conceptual framework of multiple theories in the areas of motivation, learning, and identity. The conceptual framework includes Maslow's (1943) hierarchy of needs, Bandura's (1986) social cognitive theory, Rogers' (1959) personality theory, and Wenger's (1998) work in communities of practice. See Figure 1.

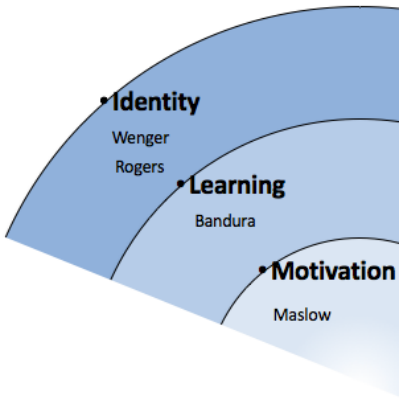

Figure 1. An illustration of the primary theories in the conceptual framework.

In his theory of human motivation, Maslow (1943) outlined five hierarchical levels of basic needs that motivated humans: beginning with physiological needs, then safety, love and belonging, esteem, and ending with self-actualization. Beyond these basic needs, he added preconditions that included many freedoms related to humans' cognitive capacities to see, think, and learn. Taking these preconditions one step further, he theorized the potential for additional basic needs in intelligent humans, which were the desires to know and to understand, as well as to continually seek more information in order to better organize, analyze, and assign meaning to the world. Freedom and personal agency are also core to Bandura's (1986) Social Cognitive Theory.

At the foundation of Bandura's (1986) social cognitive theory is the understanding that humans have the capability of symbolization, forethought, vicarious observation, self-regulation, and self-reflection. Through these capabilities, humans think, act, and engage with others in their environment. He was intrigued by the way humans produced novel, visionary thoughts, which led him to theorize about personal agency, freedom versus determinism, and creative modeling for innovation. Social learning and cognitive apprenticeships are also central to the work of Wenger (1998).

In 1998, Wenger expanded on the theory of situated learning and legitimate peripheral participation that he developed with Lave in 1991. He focused on the dual concepts of communities of practice and identity as entry points into his social theory of learning. His position was that learning took place in the context of lived experiences of participation and that learning was essentially a social phenomenon. Four components of his theory illustrated how social participation entailed learning: (1) the way humans experience life as meaningful (meaning), (2) shared resources that sustain mutual engagement (practice), (3) social configurations (community), and (4) how humans learn and create a history of becoming in communities (identity). Identity is also fundamental to Rogers' (1959) personality theory.

Influenced by Maslow, Rogers (1959) developed his theory of personality. He proposed that an individual's concept of self was a fluid and changing process with three primary components: (1) self-perceptions, self-awareness, or self-image; (2) conditions of worth such as an unconditional positive self-regard, self-worth, or self-esteem; and (3) the self-ideal or the ideal self. One's self-concept (i.e., self-image, self-worth, and self-ideal) were shaped through the organization of self-experiences.

In looking across the theories of Maslow (1943), Bandura (1986), Rogers (1959), and Wenger (1998), it is possible to draw parallels in the conceptual framework. The thread of socialness runs through the theories highlighting the foundation that we are social beings living in communities. The threads of freedom and agency also run through the theories, showing how these concepts are core to growth and development. There is a fundamental alignment in the theories of Maslow and Rogers, as well as between the theories of Bandura and Wenger. In some ways, the work of Rogers and Wenger might be thought of as extensions of the earlier work by Maslow and Bandura, respectively. These theories are essential to interpreting lived experiences of connectedness in personal learning networks.

Literature Review

Since the mid-nineties, the research on connectedness has been growing. Connectedness has been studied from the perspective of self-psychology and social identity theory. Around the end of the twentieth century, scholars took an interest in connectedness as it applied to learning. Since that time, connectedness has been studied in the context of motivation, community, persistence in online learning programs, as well as in the doctoral experience of dissertating. Most recently, researchers have validated a reliable instrument that measures connectedness based on four constructs of comfort, community, facilitation, and interaction (Bolliger & Inan, 2012). Similarly, Lee and Robbins (1995) began researching connectedness (as an aspect of belongingness) using a self-reporting instrument and included the construct of community.

In 1995, Lee and Robbins aimed to develop a valid self-reporting instrument of belongingness. Based on self-psychology theory, they positioned connectedness as an aspect of belongingness, in which an individual first experiences one-on-one companionship followed by small group affiliation before maturing to experiences of connectedness with community. Based on the literature, they determined that belongingness needed to be studied phenomenologically to develop a comprehensive understanding. In searching for theoretical aspects of belongingness, they discovered that social connectedness was related to "one's opinion of self in relation to other people" (p. 239). In 1998, Lee and Robbins extended their research to examine the relationship between social connectedness, self-esteem, and identity. They described social connectedness as "the subjective awareness of being in close relationship with the social world" (p. 338). They believed an individual has an enduring internal sense of belonging based on the sum of all social relationship experiences, and that this provides a lens to view the world. Based on social identity theory, they opined that individuals were motivated to continually seek more relationships and that the need to belong was the driver for developing a social identity. In their discussion of interventions to enhance social connectedness, they concluded that "social identification requires a degree of interpersonal trust" (p. 343) and that, in some instances, the risk may be too high for individuals to join new social groups. Connectedness in the context of community was extended in the seminal work of Rovai (2002a, 2002b) who studied connectedness in learning.

Rovai (2002a) made a significant impact on the research of connectedness when he developed the Classroom Community Scale. After building the scale, he then used it to study the relationship between feelings of community and cognitive learning (2002b). He proposed that emotional connectedness might provide support to persist in an online learning program and to increase learning. Based on the literature, he described a sense of community as encompassing "mutual interdependence among members, connectedness, trust, interactivity, and shared values and goals" (p. 321). He proposed how connectedness in a learning community might lead to feelings of safety and trust, which might lead to the freedom to speak openly, which in turn might make students more likely to be open to acknowledging knowledge gaps, and respectfully supporting class colleagues to learn. For Rovai (2002b), meaning was constructed, knowledge acquired, and values internalized through a social community of learners. He discussed how a greater sense of community might increase motivation and access to resources of learning through class colleagues. His results showed "students with stronger sense of community tend to possess greater perceived levels of cognitive learning" (p. 330). Scholars were interested in extending Rovai's (2002a) scale to measure connectedness in doctoral students' dissertation experiences.

In 2009, Terrell, Snyder, and Dringus designed a survey to measure connectedness during the dissertation experience of doctoral students. Building on Rovai's (2002a) Classroom Community Scale, researchers modified the instrument and added items given an understanding "that connectedness relates not only to feelings of belonging, trust, and acceptance but connectedness also pertains to the degree to which students have access to knowledge, skills, and resources" (p. 114). Their outcomes indicated that the doctoral students experienced low levels of connectedness while dissertating. Researchers proposed implementing student-led communities of practice, among other interventions, as a means for improving feelings of connectedness in doctoral programs. The literature on connectedness continued to grow when researchers developed an instrument for measuring connectedness in the online context.

Bolliger and Inan (2012) conducted a study to develop and validate an instrument to measure connectedness in online learning. To inform their work, they drew on literature about factors pertaining to student connectedness including community and social presence, comfort, facilitation of learning, and collaboration and interaction. They validated a reliable instrument to measure connectedness with subscales in comfort, community, facilitation, and interaction.

This review of literature shows how the research on connectedness grew out of self-psychology and social identity into learning in various contexts including classroom learning, dissertating, and online learning. A focus on community is the most common thread that runs through the existing research on connectedness. Most scholars have studied connectedness using validated survey instruments, which indicates that research using a different lens might illuminate different aspects of the phenomenon.

Purpose

This study aims to extend the literature on connectedness by building an understanding of the phenomenon through the lens of post-intentional phenomenology. To this end, the researcher asked the primary question: How might connectedness take shape in personal learning networks? To support the primary question, the researcher asked three sub-questions: (1) What is it like to experience connectedness with people, ideas, information, and technologies in a personal learning network; (2) in what ways might a learner experience connectedness between formal and informal learning; and (3) what are the processes and products of meaning-making through

connectedness in personal learning networks? For the purposes of this study, the definition of connectedness was drawn from Merriam-Webster's common usage as "the state of being closely joined or linked especially in an emotional way." In the context of a personal learning network, the joining or linking of connectedness could encompass: (1) online environments, technologies, or media; (2) online networks of people including classmates, teachers, experts, or peers; and (3) online content, ideas, or information.

Methodology

Context

This study was situated within the personal learning networks of doctoral students. The phenomenon of being connected with and through people, ideas, and technologies in a mobile, online, and networked space resided in the lived experiences of the doctoral students. The complexities and multiplicities of experiencing human connections and social technologies could only be accessed through individuals who had experienced them.

Participants

A call went out to potential participants through individual email messages to a network of 44 graduate students. This network of students was selected because they were likely to provide access to the phenomenon and rich data. Three men and three women completed all three phases of data moments.

Procedures

The data for this exploratory research were collected in three phases of data moments: lived experience descriptions, think-aloud observations, and in-depth interviews. In the first phase, participants were given guidelines for the written lived experience description (Van Manen, 1990) and asked to complete it within two weeks. One week after completing the lived experience descriptions, the second phase of data was gathered using a written protocol that guided the think-aloud method of observation in which a participant spoke her thoughts aloud while navigating her personal learning network during a recorded screen capture of an online video meeting. One week after the think-aloud observations, semi-structured interviews were conducted using an interview protocol. Additionally, throughout the three phases of data gathering, the researcher kept written analytic memos and a post-reflexive journal (Vagle, 2014), which included (1) moments when the researcher instinctively connected or disconnected with the data; (2) assumptions of normality; (3) beliefs, perceptions, perspectives, opinions that the researcher held; and (4) moments when the researcher was surprised by the data.

Instruments

Three data moments were gathered for triangulation: written lived experience descriptions, think-aloud observations, and in-depth semi-structured interviews. The protocol for the lived experience descriptions asked participants to describe in detail a specific moment when they felt connected through online environments, technologies, or media; connected with online networks of people including classmates, teachers, experts, peers, or others; or connected to content, ideas, or information. The think-aloud observation protocol provided procedures for before, during, and after the one-hour recorded session. The script for conducting the think-aloud sessions included an introduction and instructions, thinking aloud practice, questions for the researcher, information about recording, and an initial task to access and use their personal

learning network. This was followed by optional follow-on tasks such as (1) connecting with technologies, people, ideas, or information; (2) showing chronological processes of connecting; (3) demonstrating a situation described in the written anecdote; (4) connecting formal and informal learning, and (5) talking through using digital literacies and critical thinking while using their personal learning networks. The one-hour semi-structured interview protocol included questions on the topics of connectedness in personal learning networks, bridging formal and informal learning, and meaning-making. On the topic of connectedness, participants were asked to describe the experience of making connections in their personal learning networks, which was supported with follow-up probing questions. On the topic of bridging formal and informal learning, participants were asked about when it occurs, what it looks like, and what it is like to experience. On the topic of meaning-making, participants were asked about the ways they make meaning from their experiences, and how they make sense of and within their networks.

The researcher's intentional relationship with the phenomenon as it moved and evolved was documented in analytic memos and a post-reflexion journal. In his move to the post, Vagle (2014) extended the phenomenological notions of bracketing and bridling to post-reflexivity, which he explained "can be practiced as a dogged questioning of one's knowledge as opposed to a suspension of this knowledge" (p. 74). In the post-reflexion journal, the researcher writes about connections, disconnections, assumptions, steadfast perspectives, and shocking moments. In operationalizing lines of flight in data analysis, researchers dwell in moments when data resists orderly structure and when noticing binary thinking, certainty, uncertainty, or the pull of normative thinking. The methodological data in the analytic memos and post-reflexion journal illustrates the evolving intentional relationship between the researcher and the phenomenon (Kennedy, 2017).

Findings and Discussion

Data were analyzed and interpreted using a whole-parts-whole process (Vagle, 2014) that began with a holistic reading of the entire text including each participant's description, observation, and interview. The whole-parts-whole process continued with a series of line-by-line readings. In the first line-by-line reading, the researcher marked excerpts, took margin notes, and journaled. In the second line-by-line reading, the parts (i.e., markings and margin notes) were read as a whole to articulate meanings about them, which resulted in a new document of meanings for each participant. In the third line-by-line reading, the parts (i.e., meanings) were read as a whole across each participant's data moments to articulate analytical thoughts about each part. In the fourth line-by-line reading, the researcher read across all participants' data to interpret tentative manifestations of the phenomenon. The tentative manifestations were interrogated using the analytic technique of chasing lines of flight informed by Deleuze and Guattari (1987). The tentative manifestations include connectedness as motivation, learning, and identity (see Figure 2).

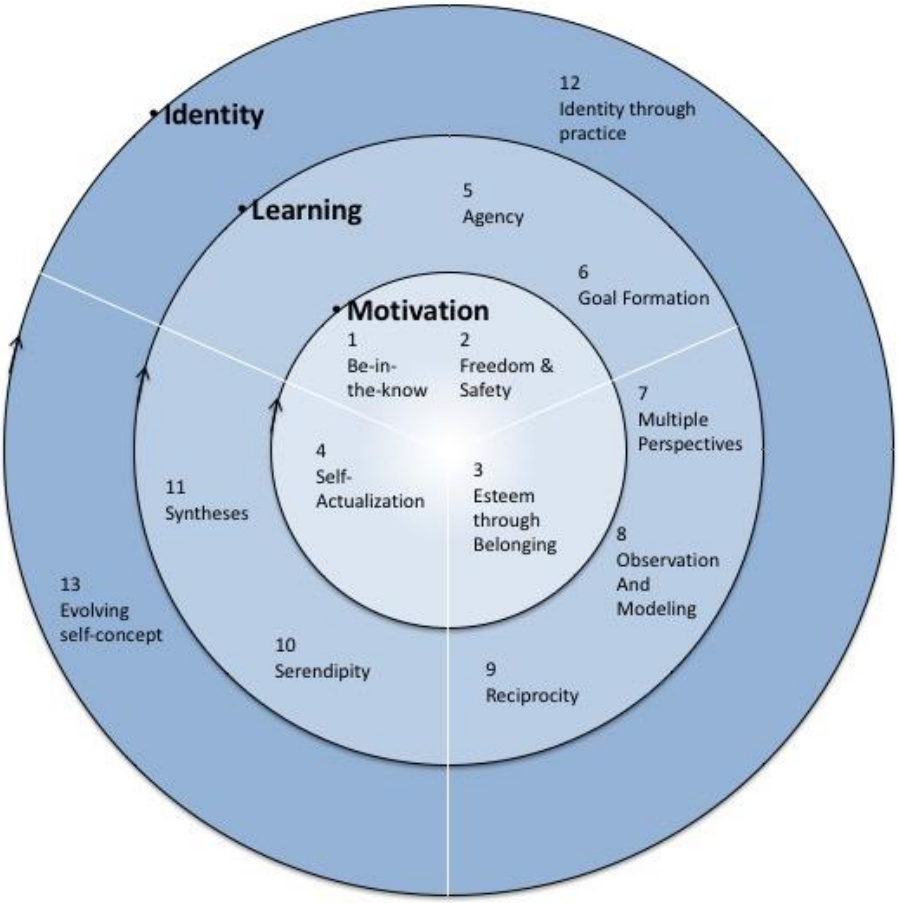

Figure 2. A model of connectedness in personal learning networks.

Connectedness as Motivation

To experience connectedness in a personal learning network was to be motivated by the desire to be-in-the-know, the needs for safety and freedom, esteem through belonging, and self-actualization. See Table 1 for a list of findings and example excerpts.

Table 1
Tentative Manifestation of Connectedness as Motivation

Finding and Example Excerpts
Being-in-the-know: Jason (all names are pseudonyms) used social media to "see what's going on." He's "on late night and maybe once during the day." He found information and ideas that piqued his curiosity. These included topics about his personal interests and hobbies, as well as topics he felt passionate about that had an emotional appeal. He described these diverse topics as being "in close proximity to each other temporally." In this way, the experience of learning through connectedness by being-in-the-know took the shape of small doses of emotional feel-goods and cognitive curiosity stimulation, peppered with ideas and information for learning so that the agent felt he was privy to current and timely happenings.
Freedom and Safety: In the experience of connectedness, agents sought safety, freedom, comfort, and support. Eric described how meeting with colleagues in a private Facebook group gave them freedom and safety: "a chance for us to chat 'off the record' and not on school email." The group had received push back from staff members who were not on board with their direction and they needed a private, safe space to share ideas.
Esteem through Belonging: Inspired by her professor, Andrea worked hard at a challenging task and the professor recognized her accomplishment and responded to her with words that "energized and encouraged" Andrea to set more challenging goals. Similar to other participants, Andrea's sense of belonging extended beyond professional and academic communities to her personal connections.
Self-actualization: When an agent engaged in a project in a content area that transected personal, professional, and academic interests, it took on a particularly powerful characteristic of outstanding, supreme relevance—an uber-relevance. For example, Jason took a research course in his graduate program and used a personally relevant content topic that had immediate relevance for him, as well as future relevance: "I'm in a… research course right now and one of the things that I'm working on is trying to build up the next version of this website… I'm trying to figure out how to do this." In his process of completing an assignment for a research course, he was simultaneously using his personal learning network to draw on his own experiences and the expertise of others while digging into theoretical underpinnings to advance his ideas and project that he was developing.

Being-in-the-know. Maslow (1943) wrote that the need to know and understand was part of one's need to organize the universe to feel safe and to express self-actualization, as well as part of the freedoms that were preconditions for basic human needs. He wrestled with the role of curiosity, learning, philosophizing, and experimenting as human motivators. He proposed that even when humans know and understand, they continually want to know more and understand more. Therefore, he postulated "a basic desire to know, to be aware of reality, to get the facts, to satisfy curiosity" (p. 385). He explained:

> The facts that we acquire…inevitably get theorized about, and either analyzed or organized or both. This process has been phrased by some as the search for 'meaning'. We shall then postulate a desire to understand, to systematize, to organize, to analyze, to look for relations and meanings. (p. 385)

This notion is similar to the ideas put forth by Siemens' (2005), who integrated principles of

chaos, network, complexity, and self-organization to theorize a connectivist model of learning in which currency—accurate, up-to-date knowledge—was the goal of all learning activities. He proposed that learning and knowledge were supported by diversity of opinions, and that the ability to make connections between fields, ideas, concepts, and sources of information was essential. He believed, "nurturing and maintaining connections is needed to facilitate continual learning" (para. 23). The findings showed that participants pursued a perpetual state of being-in-the-know.

Freedom and safety. In his theory of human motivation, Maslow (1943) wrote that people seek safety "in a predictable, orderly world" (p. 377). He proposed that people require freedoms as prerequisites to fulfilling their basic human needs. These freedoms include the freedom to speak, to express one's self, to seek information, and to defend one's self. Participants experienced issues with trust and risk. They sought safety, comfort, freedom, and support.

Esteem through belonging. Maslow (1943) proposed that humans sought love, affection, and belonging. Beyond belonging, he claimed a person desired a high evaluation of oneself, self-respect, self-esteem, and the esteem of others. He divided the esteem needs into two categories: (1) the desire for strength, achievement, adequacy, confidence, independence, and freedom; and (2) the desire for reputation or prestige, recognition, attention, importance, or appreciation. For participants, growth and recognition that came from belonging required courage to participate. The outcome of the experience gave participants a feeling of pride, honor, and satisfaction in accomplishing a challenging shared goal. The feeling of belonging provided the encouragement and support that a participant needed to strive for greater challenges. Some experiences were deep and personal, while others were more superficial. Participants experienced structure around a sense of belonging, as in academic settings, professional meetings, conferences, or workspaces. In other areas of a participant's life, belonging was experienced in unstructured environments, as in personal relationships.

Self-actualization. The desire for self-fulfillment, what Maslow (1943) called self-actualization, is the peak of hierarchical needs. He described it as the desire "to become everything that one is capable of becoming" (p. 382). Participants were driven by curiosity in a trajectory towards self-actualization through challenging goals. A participant's drive towards self-actualization was evident in tacit and explicit goals, curiosity, and the relevance found in experiences.

Connectedness as Learning

Connectedness afforded (1) conditions that fostered agency, (2) interactions that informed tacit and explicit goal formation driven by curiosity, (3) opportunities for observations and modeling, (4) experiences of reciprocity, (5) access to multiple perspectives for creative and critical thinking, (6) fortuitous chances of serendipity, and (7) syntheses of ideas and information that involved organizing, reflecting, writing, and producing. See Table 2 for a list of findings and example excerpts.

Table 2
Tentative Manifestation of Connectedness as Learning

Finding and Example Excerpts
Agency: Michelle began using social media, Twitter specifically, for her own personalized professional development: "I started to see and use Twitter for professional development." For Michelle, the agency that was afforded through connectedness created a learning experience that felt cool, refreshing, and freeing.
Goal Formation: While Eric was attending a conference session, he had research methodologies at the fore of his mind from a recent conversation with a professor. It was this lens of methodologies that he used to see and hear the conference presentation; looking for input that would inform his research study. In this way, the formal learning informed his goal formation, which was to seek more information about research methodology. The informal learning experience provided input for creative and critical thinking, which helped shape his thoughts and ideas for the direction of his research methodology.
Multiple Perspectives: Chris was invited to participate in an informal professional group on a topic of interest. This group provided Chris with timely announcements about "what's happening in this world of development and pedagogy." He engaged with people who "were operating at a very high level, they were very informed on these kinds of issues of pedagogy and of teaching and instructional design." Furthermore, they were "very well versed, … they had an affinity for these kinds of conversations." Chris appreciated the insight from these viewpoints for creative and critical thinking. They would help one another improve their work.
Observation and Modeling: Through connectedness, agents observed model behaviors, actions, activities, language, conversations, as well as thoughts and ideas written by professors, professionals, and peers. Eric sought innovative leaders and forward thinkers as models for growth and improvement. He used the analogy of golf to explain: "improving as a result of networking with people that are better than me… I like to play golf with people who are better than me because I carefully watch how they play golf and how they approach the game."
Reciprocity: For Andrea, the experience of reciprocity felt rewarding when she was able to offer practical and useful information to her classmates. After sharing her knowledge in one particular class session, a classmate sought her out to ask her for more information and guidance on the topic of her presentation. Andrea felt needed for the first time. According to Bandura's (1986) social cognitive theory, Andrea's feelings could be interpreted as part of the motivational processes that occur in observational learning in which positive social reactions and self-efficacy incentivize the learner when she experiences success and mastery of a difficult task. This instance illustrated the moment in which a learner developed from a novice to an expert who could help others to learn and grow. In a discussion of creative modeling, Bandura (1986) described how experts continue to learn and grow, evolving their craft by learning from others and incorporating the information to give their practice new dimensions. While this was one of Andrea's first experiences of feeling needed as an innovative expert, it would likely be the first of many similar experiences.

Serendipity: Resources with real-life relevance for problem solving came to Michelle serendipitously in many ways. In one instance, she was surfing Pinterest, which she had primarily used only for personal topics unrelated to her work or academics, when she serendipitously found memes that were useful for her practice. Through her informal learning, she learned more about what it was that she needed in order to support her formal learning as a graduate student and teacher.
Syntheses: While Jason engaged in formal and informal learning, he gathered resources, organized them topically, and stored them within course or project folders on his computer. His process for organizing content was evolving and he had begun to use a reference management system to create his own database of resources. He anticipated that the new organizational process would be more efficient and less frustrating. Jason experimented with various technologies in his evolving process of organizing, capturing, storing, and synthesizing ideas and information.

Agency. Bandura (2001) defined agency as "acts done intentionally" (p. 6). He discussed three kinds of agency: personal agency, proxy agency through others, and collective agency through interdependent groups. In Dewey's (1938/1997) philosophy of educative experience, agency was an inherent part of an educative experience through the principle of individual freedom (which he viewed as power and self-control) and the basis for intelligence (specifically the formation of purposes and the organization of means to carry them out through a pattern informed by the experimental method of science involving idea generation, actions, observations, and organization). The participants developed new understandings by advancing through a self-regulated process that began with agency.

Goal formation. Active participation and cooperation in the formation of purposes that guided plans and directed actions and activities was a hallmark of Dewey's (1938/1997) philosophy. He believed a purpose was a moving force born out of desires, which picked up momentum through observation, information, and judgment to evolve into a plan of action. He viewed a purpose as a cooperative, reciprocal give-and-take between an expert and novice. Thus, the purpose was the starting point to develop progressively and orderly into an expansion and organization of information in a cycle of perpetual, life-long growth through continuity of experiences. He theorized and operationalized his philosophy by using the pattern of an experimental method of science to illustrate how an agent could extract meaning from experience. The quality and effect of experience influenced what kinds of future experiences would be made possible and probable. Forming tacit and explicit goals that stemmed from desires and interests with a plan of action was the starting point of Dewey's notion of using the experimental method as a pattern for educative experience (Dewey, 1938/1997). In this study, the participant's formed tacit and explicit goals born out of their interests.

Multiple perspectives. In a discussion of creative modeling, Bandura (1986) wrote about his view of originality and innovation. He believed creativity and creative endeavors grew out of multiple sources as models for different styles of thoughts and actions. An observer, taking diverse viewpoints, synthesizes them to create a new, original work, thought, or action. Thus, from Bandura's (1986) perspective, the value of multiple perspectives is in the potential for multiple, diverse modeling influences. Participants' experiences showed how multiple perspectives encountered in formal and informal settings fostered creative and critical thinking.

Observation and modeling. Bandura (1986) wrote extensively about observational learning through modeling. He expounded the subprocesses involved in observational learning from an observer's selective attention of a modeled event, through how information is retained by vivid imagery and cognitive rehearsal, then finally how actions were produced to form a matching pattern of the model. He described motivational subprocesses involved in observational learning including social reactions, material benefits, and efficacy experienced from exercising control. Likewise, Dewey (1938/1997) advocated for using scientific discovery that included observation. In his principle of interaction between internal and external conditions, he highlighted the relevance of both external environmental conditions and interpersonal factors for promoting educative experiences. Through early social media experiences, one participant learned about netiquette and developed digital literacies, but these were "life skills and social skills and… unintentional learning pieces" (Nicole, Interview, l. 253) formed through informal experiences of observation and modeling. These cognitive and enactive rehearsals would be considered part of retention and production in Bandura's (1986) theory. The participants' experiences of engaging with multiple models for observational learning epitomized social cognitive theory and creative modeling for innovation in particular.

Reciprocity. Bandura (1986) advocated for a model of triadic reciprocality in which thoughts, actions, and environmental conditions—including other people—influenced one another interactively as an explanation of human functioning. By analyzing behaviors, cognitive personal factors, and environmental conditions, he theorized how these three deterministic factors in his triadic reciprocality model were influencers of, and influenced by, one another. He discussed how beliefs shaped behavior in an interaction of cognition and action. He considered how modeling by people in an individual's social environment could modify the individual's thoughts. He proposed that actions, thoughts, and the environment reciprocally influenced one another bi-directionally in a triadic fashion.

Participants experienced triadic reciprocality through connectedness, often in a pay-it-forward relational experience in which recipients of good will helped others. In the context of observation and modeling, paying-it-forward occurred when participants observed experts, learned from them, then modeled thoughts and actions for novices. In this way, the participant shifts between novice and expert (i.e., apprentice and master). This concept is integral to several learning theories, not only from Bandura (1986), but also from Dewey (1938/1997), Vygotsky (1978), as well as Lave and Wenger (1991).

Dewey (1938/1997) focused on the interplay between external environmental conditions and interpersonal factors for supporting educative experiences through interactions. He believed internal and external conditions determined the quality and effect of an experience. Similarly, Vygotsky's (1978) sociocultural theory of learning focused on the reciprocal interaction among society and the individual, what Bandura considered environmental conditions and cognitive factors. Vygotsky (1978) believed individuals constructed meaning socially from their sociocultural environments and then internalized meanings and beliefs. In an enduring cycle,

cultural tools in the environment influences an individual's cognitive processes, and reciprocally, the thoughts and actions of the individual in society influences the design and use of cultural tools and technologies in the environment. Likewise, situated learning (Lave & Wenger, 1991) and communities of practice (Wenger, 1998) foreground cognitive apprenticeships and the influence of contextual, situational (i.e., environmental) factors in the learning experience, particularly in the social experience of learning. Cognitive apprenticeships, a concept aligned with Bandura's (1986) notion of observational learning through modeling, are methods applied to formal schooling in which the teacher demonstrates thoughts and actions explicitly for students to observe and practice. Situativity theory is grounded in environmental contexts, dynamic relationships, and reciprocity inherent to interconnected relationships for learning (Schuh & Barab, 2008).

Serendipity. In an extension of his model of triadic reciprocality among actions, thoughts, and environmental conditions, Bandura (1986) proposed fortuity as a fourth determinant of human functioning. He wrote that chance encounters could have a profound impact on human experience and life paths. Personal attributes such as ingenuity, personal interests, perseverance, and an inquisitive mind, along with specialized skills and knowledge, could positively impact the potential for serendipitous discoveries. Individuals with a strong sense of agency would be more capable of taking advantage of an opportunity brought by fortuity. Participants described instances of chance encounters when fortuitous events occurred particularly in the process of observational learning and creative modeling. Each participant possessed an open, inquisitive mind and explored new ideas through multiple sources in their network. Each participant, possessing specialized knowledge and skills, identified meaningful coincidences when they occurred and then, through agency, connected ideas into new creative syntheses. The personal attributes of the participants—particularly their strong sense of agency, ingenuity, and inquisitiveness—lent themselves to the ability of capitalizing on serendipitous moments for learning.

Syntheses. A significant aspect of Dewey's (1938/1997) philosophy of educative experience was that intelligent activity stemmed from patterns of experiences based on the experimental method of science that required an individual to analyze and synthesize information to create orderly organization from observations during experiences. In order to promote the expansion of ideas and continuity of experiences, he proposed that agents would be required to document and keep track of ideas and information. Intelligent activity called for agents to organize, reflect, and summarize new ideas and information. He explicated how the information, ideas, actions, observations, organization, reflection, summaries, analyses, and syntheses would differ for each agent given their unique experiences and perspectives. Likewise, Bandura (1986) also advocated for the importance of syntheses of multiple perspectives in observational learning through modeling, particularly in creative modeling. He believed agents who were exposed to divergent ways of thinking and observed problems being approached in diverse ways were more likely to be versatile and innovative. By synthesizing observations from multiple models, agents demonstrated their creativity through novel innovations.

Connectedness as Identity

To experience connectedness was to become, to evolve one's self-concept and identity through practice. See Table 3 for a list of findings and example excerpts.

Table 3
Tentative Manifestation of Connectedness as Identity

Finding and Example Excerpts
Identity through practice: Informal learning was agent-driven and, as such, afforded authenticity of identity in practice when one's self-image converged with one's public persona, or ideal self. The formal and informal learning influences in his network shaped Eric's scholarly interests, beliefs, and choices. His unique, authentic identity positioned him to belong and become an active participant in a collective of diverse experts in his place of practice. In a cyclical fashion between formal and informal learning, Eric's unique identity as a practitioner, his training, and his beliefs shaped the kinds of people he sought to include in his network, and these connections influenced his exposure to new ideas, which further shaped his learning experiences and his identity: "My experience in a formal setting then had an impact on what I looked for in the informal setting in the conference."
Evolving self-concept: Similar to other participants, Andrea also identified with an expert in her field because they shared common interests and a common cultural heritage. Andrea was encouraged and inspired by the expert to pursue a topic of common interest, which she presented to classmates. Classmates sought out Andrea to learn more about her topic, which positioned her as an expert in her field and subsequently boosted her self-esteem. This cycle of learning and teaching, and consuming and producing information ran through agents' lived experiences of connectedness. Andrea's self-experiences illustrated how connectedness impacted all aspects of an agent's self-concept, including her self-image, self-ideal, and self-worth.

Identity through practice. Wenger (1998) drew a parallel between practice and identity. He perceived them as mirror images. Just as with practice, he construed identity as negotiated experience, as community membership, as learning trajectories, and as a nexus of multimembership that required the continual reconciliation of converging and diverging trajectories. Through identity in practice, participants fostered self-concepts of competence and confidence in a continual, on-going process of participation and reification in a nexus of multimembership in communities of practice.

Evolving self-concept. Rogers (1959) proposed that an individual's self-concept was composed of three elements: a positive self-regard, self-awareness, and a self-ideal. These constructs were shaped through self-experiences, which consisted of events or entities that informed self-perception and self-concept. The personal constructs of self-image, self-esteem, and the ideal self evolved through connectedness in the participants' lived experiences. The participants' lived experiences illuminated an active, dynamic, evolving self-concept—self-awareness, self-regard, and self-ideal—shaped by self-experiences that were afforded through connectedness in each personal learning network.

Conclusions

This study has implications for research and practice by contributing to the literature on connectedness and providing a foundational understanding about experiences of connectedness from which the field can build upon. Moreover, this research advances post-intentional phenomenological philosophy and methodology in the field. From the results, the tentative manifestations describe (1) the shape of connectedness in personal learning networks; (2) what it is like to experience connectedness with people, ideas, information, and technologies in a personal learning network; (3) ways that a learner might experience connectedness between formal and informal learning; and (4) the processes and products of meaning making through connectedness in personal learning networks.

Primary Research Question

How might connectedness take shape in personal learning networks? Connectedness took the shape of motivation, learning, and identity. Connectedness as motivation was depicted through needs for safety and freedom, esteem through belonging, self-actualization, and the desire to be-in-the-know. Connectedness as learning was illustrated through experiences of agency, goal formation, observation and modeling, reciprocity, multiple perspectives, serendipity, and syntheses. Connectedness as identity was evidenced through an evolving self-concept and identity through practice.

Sub-Question: Experiencing Connectedness

What is it like to experience connectedness with people, ideas, information, and technologies in a personal learning network? To experience connectedness was to be motivated by the desire for safety and freedom, esteem through belonging, self-actualization, and being-in-the-know. To experience connectedness was to learn through agency, forming goals, observing, modeling, reciprocating, seeking and finding multiple perspectives, being surprised by serendipitous discoveries, and generating syntheses. To experience connectedness was to become, to evolve one's self-concept and identity through practice.

Sub-Question: Formal and Informal Learning

In what ways might a learner experience connectedness between formal and informal learning? Connectedness between formal and informal learning was experienced in multiple and varied contexts that ran through the tentative manifestations of connectedness as motivation, learning, and identity. Connectedness between formal and informal learning provided the contexts in which participants experienced motivating forces. For example, they sought freedom in informal learning and safety in the structure of formal learning. They sought esteem and belonging in both formal and informal learning contexts. The trajectories towards self-actualization were enmeshed in both formal and informal learning contexts, each informing the other in a cyclical pattern that propelled participants toward their goals. The desire to know and understand, to be in a perpetual state of being-in-the-know was fulfilled in the interplay of both formal and informal learning contexts. The formal and informal learning contexts were essential to the rich, learning process from informing goal formation to observation and modeling, reciprocity, multiple perspectives, serendipity, and syntheses. Participants experienced connectedness as identity in both formal and informal learning contexts through the impact of both on an evolving self-concept and identity through practice. Formal and informal learning acted as dual impactors that shaped the experiences of connectedness as motivation, learning,

and identity.

Sub-Question: Meaning

What are the processes and products of meaning making through connectedness in personal learning networks? Meaning was negotiated through connectedness by way of the people, ideas, information, and technologies in the network. The processes by which participants negotiated meaning involved agency, goal formation, observation and modeling, reciprocity, multiple perspectives, serendipity, and syntheses. The products of negotiated meaning through connectedness were the participant's evolving self-concepts and identities transformed through practice.

Further Research

In 1995, Lee and Robbins proposed belongingness, along with the characteristic of connectedness, should be studied phenomenologically to develop a comprehensive understanding. This research contributes to the understanding of connectedness from a post-intentional phenomenological lens. In addition, they discovered that social connectedness was related to self-perceptions informed through relation to others. The finding of an evolving self-concept shaped through practice while engaged with others is in alignment with their results. In 1998, Lee and Robbins believed individuals were motivated to seek relationships and that the need to belong drove the shape of a person's social identity. Moreover, interpersonal trust was an important factor in social connectedness. This research found that the drive for esteem through belonging was a motivator that led to an evolving self-concept through engaged practice with others. Furthermore, this research supports the finding that trust and safety are important factors in the experience of connectedness.

Rovai (2002b) also proposed the importance of safety and trust, and how these might lead to freedom to speak openly. He believed a sense of community, which includes connectedness, might increase motivation, greater access to resources, and improved cognitive learning. The findings of this study support his assertions. In 1943, Maslow proposed that people require freedoms as prerequisites to fulfilling their basic human needs including the freedom to speak, to express one's self, to seek information, and to defend one's self (Maslow, 1943). This study supported the importance of freedom as a powerful motivator that leads to seeking and finding multiple perspectives towards self-actualization.

Terrell, Snyder, and Dringus (2009) proposed that connectedness encompassed feelings of belonging, trust, and acceptance, as well as access to knowledge, skills, and resources. They believed a community of practice approach might increase connectedness. The findings support their assertion that an aspect of connectedness involves access to multiple perspectives for gaining knowledge and resources. The finding of identity through practice would support the notion that a community of practice might lead to greater experiences of connectedness that would shape identity.

A hallmark of post-intentional phenomenology is that it resists finality. Vagle (2014) explained that the Deleuzo-Guattarian concept, lines of flight, foregrounds how things connect and how phenomena takes off. It does not assume that any "idea, belief, goal, phenomenon, person, animal, object, etc. can be thought of as stable, singular, and final" (p. 118). Thus, it is a goal of this research study to be generative. As such, possible avenues of further research may include exploring how connectedness and nomadic thinking might foster activism and civic engagement, employing design-based research to develop a next-generation learning

management system that is designed to foster experiences of connectedness and cultivation of a personal learning network, and grounding educational networking research in philosophies of technology.

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