
**ECOLOGY OF THE LEARNING ENVIRONMENT:
CREATING THE CONTEXT FOR SPIRITUAL FORMATION**
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Abstract

The learning environment is a potential space for transformation. As such, studying the dynamic system (ecology) comprised of facilitators (educators, leaders, pastors), learners (students, followers, congregants), and their relationship leads to potential effectiveness in spiritual formation. This article explores the contribution of neuroscience and transformative learning to that system and offers subsequent implications for environments that encourage spiritual formation.

Confessions of a Reluctant Teacher...

Suddenly, I had the impression that I was outside my body, looking down on the audience and myself while I presented.

While initially excited to speak at a Christian camp attended by students from all over the Rocky Mountain West, the mental obsessiveness and lurking anxiety about the presentation took their toll in the weeks leading up to the event. Rather than easing as I prepared, the anxiety became a monster and practically took over in the days before my presentations until I couldn't sleep and considered cancelling. I even prayed that I would get some death-bed disease, just for the week of the camp, so I couldn't travel to Colorado.

Yet my performance orientation prevailed, and I stood before, or rather above, the students and gave my talks. It was easier after the first one, but the harrowing experience left me dreading the possibility of future presentations, and I seriously considered leaving the ministry.

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Several years later, while in seminary, I made a commitment to understand and tackle my extreme anxiety about talking in front of large audiences. Processing in therapy helped but not enough. I dreaded the required communications and homiletics courses, as well as the preaching practicums, leaving them until the last two quarters of my M.Div.

Over time, a number of interventions transformed my experience of teaching and speaking. With hindsight and new learning from the field of neuroscience, I now recognize how the interventions enabled these transformations, and I offer this essay for others endeavoring to create transformative learning environments. Here is a summary of the interventions: One, I understood and addressed personally, with compassion, the roots of my anxiety and fear of failure. With this extreme unease, I wasn't able to be truly present, either to those in my audience or to myself. Two, an accepting, nonjudgmental friend, who took the same preaching courses, patiently coached the writing and delivery of my sermons. That friend and I constituted a new community in which I could learn more effectively and experience transformation. Three, I was introduced to a new way of thinking about teaching and learning: it was a conceptual paradigm shift that teaching was not really about me but about serving the learning of others. These three elements form the basic structure of an ecology of learning that was crucial to the type of transformative learning whereby my anxiety was lessened and I was empowered to teach more effectively.

This transformative learning ecology was merely the start of my journey to effective teaching. Because I still wanted to have a good reputation and be known for my speaking and teaching (I know, the arrogance! It's a long journey to be formed in Christ), I recognized the need to create classroom experiences that addressed all styles of learning—audio, visual, experiential, kinetic, etc. However, teaching was still really about me. The use of technology, the discussions, the fancy power points, the well-crafted lecture fed my need to be accepted and well-

liked. But, I soon learned that pursuing gimmicks in the classroom would not necessarily lead to transformative learning and its reproducibility.

An experience in China helped me discover a paradigm for creating environments that kindle transformation. In 2005 I was asked to train Chinese professors who taught in a Master of Divinity program for pastors of “unregistered” churches in China. Their practice was to announce several weeks in advance that a class would be offered. Pastors in the region would then gather in staggered fashion in a designated apartment, where they would spend two weeks living together and listening to lectures and then return home. I did an informal needs assessment and learned that the classic M.Div. curriculum consisting of Western-enlightenment-informed systematic theology, church history, biblical studies, etc. delivered in days full of lectures and follow up assignments had little impact on the pastors’ pastoral practices and negligible influence on their personal transformation and spiritual formation. They could memorize content, but many still misused authority and cheated in their business practices (most of these pastors are bi-vocational).

I then realized that learning did not happen because of what a teacher says, but because they create an environment for learning. This requires, in Paulo Freire’s words, that the “professor” must die;¹ that is, effective educators are facilitators who create the context of learning. I initiated a quest to know and create a better learning environment.² To that purpose, this paper will highlight recent findings in neuroscience with their implications for transformative learning leading to spiritual formation. I recognize that neuroscience may not obviously signal the transformative dynamism leading

¹ Referred to in Jane Vella, *Learning to Listen, Learning to Teach: The Power of Dialogue in Educating Adults*, Revised Edition (San Francisco: Jossey-Bass, 2002), 20.

² I have chosen to use the phrase, “learning environment,” rather than classroom since learning happens in many contexts besides a classroom.

to spiritual formation, or that neuroscience has been minimally applied to the interrelationship of humans and the learning environment. However, this article proposes that recent research in neuroscience offers profound implications for those who endeavor to create environments where transformation thrives. It is my assumption that we, as leaders (educators, pastors, elders, etc.), are the primary shapers of environments, both formal (university, seminary, Bible college, etc.) and informal (in the parish, congregation, apprenticeships, internships, etc.).³ Therefore, we need to better understand ourselves and those we serve in order to create transformative spaces. New discoveries in neuroscience aid this understanding.

This essay argues that students must first experience contexts where spiritual formation happens, where transformation occurs, where the “ecology” invites spiritual formation. Then, when students take the roles of leaders, pastors, and educators, they are more likely to reproduce this ecology in future contexts.

Contributions of Applied Neuroscience to Understanding Learning Ecology

Ecology is “the study of the interrelationship of organisms and their environments;”⁴ or for the purposes of this article, the study of the interrelationships of persons and their learning environment. Because teachers are primarily responsible for organizing the learning ecology, their leadership in the process is indeed significant. Overwhelming scientific evidence suggests that what “leaders do—specifically, exhibit empathy and become attuned to others’ moods—literally affect both their own brain chemistry and that of their followers.”⁵

³ Daniel Goleman, Richard Boyatzis, and Annie McKee, *Primal Leadership: Realizing the Power of Emotional Intelligence* (Boston: Harvard Business School Press, 2002), 6.

⁴ <http://www.merriam-webster.com/dictionary/ecology> (accessed March 27, 2013).

⁵ Daniel Goleman and Richard Boyatzis, “Social Intelligence and the Biology of Leadership,” *Harvard Business Review* (September 2008), 76.

The leader/follower dynamic is a system of conscious and subconscious interaction. Therefore, the leader, educator, facilitator, administrator, pastor and so on profoundly impact whether people thrive or wilt in any given organization, including the microcosm of the learning environment.⁶

Synthesizing the latest research in neurobiology, Daniel Goleman and his team present the rationale for this dynamic.⁷ Evidence shows that people flourish, embrace transformation, and become their best in environments where there is “resonance—when leaders drive emotions positively.”⁸ Goleman labels this resonance “emotional intelligence.” Likewise, there is “dissonance—when leaders drive emotions negatively, undermining the emotional foundations that let people shine.”⁹ This is due to our brain’s functioning and more specifically, to how our limbic system (the emotional part of our brain, which includes the amygdala—the flight or fight response) operates. The limbic system is an “open-loop” system, which relies on external “connections with other people for our own emotional stability.”¹⁰ In fact, one person transmits signals that can alter hormone levels, cardiovascular function, sleep rhythms, and even immune function inside the body of another. Open-loop design means that other people can change our very physiology—and so our emotions.¹¹

Approaching human development from the complementary discipline of positive psychology, Barbara Fredrickson characterizes human flourishing in this way: “to live within an optimal range of human functioning,

⁶ Daniel Goleman, Richard Boyatzis, and Annie McKee, *Primal Leadership: Realizing the Power of Emotional Intelligence* (Boston: Harvard Business School Press, 2002), 6.

⁷ See *Emotional Intelligence, Primal Leadership: Realizing the Power of Emotional Intelligence*, and *Social Intelligence*.

⁸ Goleman, Boyatzis, and McKee, 5.

⁹ Goleman, Boyatzis, and McKee, 5.

¹⁰ Goleman, Boyatzis, and McKee, 6.

¹¹ Goleman, Boyatzis, and McKee, 7.

one that connotes goodness, generativity, growth, and resilience.” The term “languishing” refers contrastingly to “people who describe their lives as ‘hollow’ or ‘empty.’”¹² Fredrickson notes the connection to positive emotions and particularly to generativity. Her research proposes that

negative emotions function to narrow a person’s momentary thought-action repertoire. They do so by calling to mind and body the time-tested, ancestrally adaptive actions represented by specific action tendencies....positive emotions prompt individuals to discard time-tested or automatic (everyday) behavioral scripts and to pursue novel, creative, and often unscripted paths of thought and action.¹³

She labels this phenomenon “the broaden-and-build theory.”

Goleman’s research leads to a similar insight: leaders’ positive emotions inspire creativity, experimentation, and growth. This is because human beings, due to the mirroring neurons in our brains, have a tendency to take on what their limbic systems sense in another person. “Feeling good lubricates mental efficiency, making people better at understanding information...as well as more flexible in their thinking...more optimistic about their ability to achieve a goal, enhance creativity....”¹⁴

Neuroscience and Transformation, How We Change

Because of genetics and early formational social environment, some people are more naturally emotionally intelligent than others. However, because the limbic system is an open system in constant communication with others, and because our behavior creates new neural pathways, our brains can change and thus so can our

¹² Barbara L. Fredrickson and Marcial F. Losada, “Positive Affect and the Complex Dynamics of Human Flourishing,” *American Psychologist*, vol 60, No. 7 (Oct. 2005), 678.

¹³ Barbara L. Fredrickson, “What Good Are Positive Emotions?” *Review of General Psychology*, vol 2, no. 3 (1998), 304.

¹⁴ Goleman, Boyatzis, and McKee, 14.

emotional intelligence. “We are not necessarily prisoners of our genes and our early childhood experiences.”¹⁵

Neuroscience reveals that from the time we are born, consistent, present relationships, especially with primary caregivers, form the neural connections our brains need for healthy, ongoing transformation. Due to mirroring neurons, our brains are predisposed to imitate those close to us. The plasticity of our brains enables ongoing change and transformation throughout our lives, and this most readily happens in the context of trusting relationships. This is why, some say, Alcoholics Anonymous is so effective in treating alcoholism. The brain is reformed through connection in trusting, nonjudgmental relationships.

Discoveries in neural plasticity and limbic transpersonal communication have profound implications for character development and spiritual formation.¹⁶ Warren Brown and Brad Strawn connect spiritual formation to relationships in this way: “To flourish and to mature into persons of wisdom and Christian virtue, we need the shaping that comes with the best sorts of human relationships.”¹⁷

Transformative Learning

Ultimately spiritual formation is transformative, yet what does it mean to create environments for spiritual formation? Transformative learning “is the process of effecting change in a frame of reference.”¹⁸ “Adults have...associations, concepts, values, feelings, conditioned responses” which are “frames of reference that define their life world.”¹⁹ Frames of reference “are

¹⁵ Goleman and Boyatzis, 80.

¹⁶ Warren S. Brown and Brad D. Strawn, *The Physical Nature of the Christian Life: Neuroscience, Psychology, and the Church* (Cambridge: UK: Cambridge University Press, 2012), Kindle location 1304.

¹⁷ Brown and Strawn, Kindle location 1618.

¹⁸ Jack Mezirow, “Transformative Learning: Theory to Practice,” in *New Directions for Adult and Continuing Education* no. 74 (San Francisco: Jossey-Bass Publishers, Summer 1997), 5.

¹⁹ Mezirow, 5.

the structures of assumptions through which we understand our experiences. They selectively shape and delimit expectations, perceptions, cognition, and feelings.”²⁰ Frames of reference cause us to view people, values, actions, beliefs, etc. in certain ways. Our “frames” constitute the boundaries of our thinking.

Encountering difference or actions that do not fit invites a change in frame of reference or transformation. According to Jack Mezirow, transformational change happens when we encounter something beyond our experience (or something that does not make sense).²¹ An encounter with anomaly initiates the transformative learning process.²² Related to Habermas’ “emancipatory” domain of learning,²³ transformative learning is a freedom-producing process whereby self-awareness leads to an understanding of how assumptions constrain the way we see and experience ourselves and the world, which in turn, leads to change and action based on the new understanding. Educators create the environment and activities that lead to self-awareness and awareness of others’ assumptions. Of course, significant and sustained conversation is a foundational way that we learn about others and surface our own hidden assumptions. “In this

²⁰ Mezirow, 5.

²¹ Mezirow, 7.

²² Andrew Kitchenham, “The Evolution of John Mezirow’s Transformative Learning Theory,” *Journal of Transformative Education*, vol 6, no. 2 (April 2008), 105. Mezirow’s Ten Phases of Transformative Learning: 1) a disorienting dilemma, 2) a self-examination with feelings of guilt or shame, 3) a critical assessment of epistemic, sociocultural, or psychic assumptions, 4) recognition that one’s discontent and the process of transformation are shared and that others have negotiated a similar change, 5) exploration of options for new roles, relationships, and actions, 6) planning a course of action, 7) acquisition of knowledge and skills for implementing one’s plans, 8) provisional trying of new roles, 9) building of competence and self-confidence in new roles and relationships, and 10) a reintegration into one’s life on the basis of conditions dictated by one’s perspective.

²³ Kitchenham, 109. Mezirow was influenced by Habermas’s three domains of learning: 1) technical: learning is rote, straightforward, and follows rules, 2) practical: addressing social norms, and 3) emancipatory: a more generalized and global understanding of assumptions. Habermas (1971).

sense, learning is a social process, and discourse becomes central to making meaning.”²⁴ According to Mezirow,

Effective discourse depends on how well the educator can create a situation in which those participating have full information; are free from coercion; have equal opportunity to assume the various roles of discourse (to advance beliefs, challenge, defend, explain, assess evidence, and judge arguments); become critically reflective of assumptions; are empathic and open to other perspectives; are willing to listen and to search for common ground or a synthesis of different points of view; and can make a tentative best judgment to guide action. These ideal conditions of discourse are also ideal conditions of adult learning and of education...²⁵

It is critical to note at this point that transformative learning is emotional—the limbic system is highly engaged. It begins with disorientation, a threat, something that is not working, which elicits anger, fear, and shame, then proceeds to the point where the learner is open to engaging new paradigms—another potentially emotionally charged venture. Therefore, the educator must actively acknowledge feelings and encourage participants to dialogue about their feelings.²⁶ Obviously, this requires an environment where relationships and interconnectedness provide a safety net for the discomfort that often comes with tumultuous transformation. If there is no safety, the disorientation may engage the amygdala, and participants may resort to the typical defenses of “fight” or “flight.”

The self-awareness and communal aspects of learning environments are where transformative learning intersects with neuroscience leading to spiritual formation. In fact, Taylor draws upon recent findings in

²⁴ Mezirow, 10.

²⁵ Mezirow, 10.

²⁶ Edward W. Taylor, “Transformative Learning Theory,” *New Directions for Adult and Continuing Education*, no. 119 (Fall 2008), 11.

neurobiology and reports brain imaging suggests that transformative learning (1) requires discomfort prior to discovery; (2) is rooted in student's experiences, needs, and interests; (3) is strengthened by emotive, sensory, and kinesthetic experiences; (4) appreciates differences in learning between males and females, and (5) demands that educators acquire an understanding of a unique discourse and knowledge base of neurobiological systems.²⁷

Implications for Spiritual Formation

While many writers focus on the spiritual formation of individuals or the spiritual formation process that takes place in individuals, effective and lasting spiritual formation happens in community and through relationships. Relationships are critical because of the way our brains develop and change. Thus it is crucial for us to create learning environments where community is built. "The process of being known is the vessel in which our lives are kneaded and molded, lanced and sutured, confronted and comforted, bringing God's new creation closer to its fullness in preparation for the return of the King."²⁸

Integration and Implications

I propose that if we desire spiritual formation and ultimately spiritual leadership for our students, congregants, mentees, etc., we must immerse ourselves in the study of interrelationships and the learning environment—what I have loosely labeled "ecology." Neuroscience informs this system and reveals ideal conditions for transformation

I began this essay with the story of my own pilgrimage as an "ecologist" of the learning environment, and I return to it now, as a means to integrate it with the major themes discussed above. I propose four themes for

²⁷ Taylor, 8.

²⁸ Curt Thompson, *Anatomy of the Soul: Surprising Connections between Neuroscience and Spiritual Practices that Can Transform Your Life and Relationships* (Carol Stream, IL: Tyndale Momentum, 2010), Kindle location 504.

the synthesis of neuroscience, transformative learning, and spiritual formation.

One, transformation begins with an openness for initiating change. In my early years, I sensed a calling to ministry and particularly, leader development. Yet my anxiety in these settings was so extreme, I could not remain present and truly serve. If you like, my brain (limbic system) feared connection. Yet, as stated above, we are not “prisoners of our genes and our early childhood experiences.”²⁹ Transformation occurs when an envisioned ideal translates into new behaviors, which in turn initiate and strengthen new neural pathways leading to more permanent change. With resolve and diligence, I was able to understand root causes of pain and make behavioral choices, which “rewired” my brain. In order to be present, we must explore reasons for our disconnect (pain, pride, fear, etc.) and seek, by God’s grace and our inner work, to embrace transformation.

Two, those we serve mirror (for better or worse) our emotionality and spirituality, because our limbic systems connect. Others are profoundly influenced by our presence or non-presence. Therefore, we must seek to connect and offer transparency. Leaders’ transparency and modeling sparks others’ pursuit of transformation. Therefore, we must endeavor to create environments for sharing personal stories—successes, failures, learnings, etc., and this leads to the next theme, community.

Three, community is an essential context for progressive transformation. Therefore, leaders, pastors, and educators must create safe havens where trust can develop, which then accelerates the formation of new neural pathways and therefore transformation. As I received acceptance from others and dared to expose the aspects of my personality or aspirations I most feared, freedom followed. Life-producing connections replaced painful neural pathways. Informal settings, where humor, acceptance, commitment, and honest feedback are normal, aid the spiritual formation process.

²⁹ Goleman and Boyatzis, 80.

Four, if those we serve experience this type of learning environment, they are more likely to create it in the contexts where they serve in the future. Our limbic systems thrive with connection. Our brains are designed for transformation in the context of community. Experiencing freedom-producing relationships invites replication in other contexts—the deepened neural pathways naturally facilitate similar processes in new settings.

For those leaders, whether pastors, elders, educators, or mentors, desirous of creating transformative contexts that facilitate spiritual formation, understanding interrelationships and the learning environment is critical. New discoveries in neuroscience and the discipline of transformative learning offer insights to support this “ecology.”