

Transformative Learning and Sustainability

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Collaborative Authors

This paper is a collaborative effort offered by Anne Z. Parker of the Environmental Leadership Program at Naropa University and Mark D. Wilding of Passageworks Institute. Students in Naropa's Environmental Leadership Masters program work as interns at Passageworks on community-based action research projects. Our two organizations share a deep commitment to "transformative learning"¹ that engages the whole person and integrates study, reflective practice, and action. We both recognize and act from the assumption that individual, community and global sustainability is dependent on individual, community and global transformation.

Abstract

This discussion paper explores classroom and community-based methods to educate children, adolescents and young adults about how to create a sustainable world for themselves and their descendants. The authors share pedagogy that engages the whole student in transformative learning that includes different ways of knowing and seeks to integrate social, emotional, and academic knowledge. We practice an approach to sustainability that includes emotional intelligence, cultural responsiveness, and a deep connection to self, others, and the world. This experiential inquiry-based approach to learning leads students to investigate the interconnected nature of the world without teachers imposing religious or spiritual frameworks. Students discover these connections themselves with the instructor acting as facilitator. Establishing a direct, personal, and deeply felt connection with the earth and the natural world supports students to develop a healthy sense of relationship, responsibility and resilience that is based on a direct experience of ethical behavior and on feeling empowered to act sustainably. The paper explores what we have learned from our collaborative work over the past fifteen years in the classroom and in service learning settings. We will employ several different models and organizing frameworks to understand how and why transformative learning

¹ "Transformative learning rests on an enriched view of the human being, one that affirms our multidimensional nature and fundamental malleability. The methods by which we challenge our students, open them to change, will vary, but to be successful they should include cross-cultural studies in which worldviews radically different from their own are encountered and appreciated. Or one can look back sympathetically at other historical periods and the surprisingly different treatment given to social issues or natural phenomena. Finally, cognitive science and psychology are also rich with empirical studies that awaken us to the unconscious cognitive or moral processes underlying our judgments and actions." p. 107 from Palmer, P. J., & Zajonc, A. (2010). *The Heart of Higher Education: A Call to Renewal*. John Wiley and Sons.

works and why it is effective in educating for sustainability. The purpose of this discussion paper is to stimulate further dialogue, and more detailed study.

“Know Thyself... the unexamined life is not worth living” – Socrates

“They who know others are discerning; they who know themselves are intelligent.” - Tao Te Ching by Lao-Tzu

Introduction

Arising from a deep commitment to “transformative learning” Passageworks Institute² and Naropa University’s Master of Arts in Environmental Leadership³ share common ground in creating approaches to teaching that are experiential and inquiry-based. These empirical methods of teaching and learning invite students into a direct relationship to themselves, to others and to the natural world without pre-supposing religious or spiritual frameworks. This exploration is inherently “interfaith” in that it operates at the level of direct experience and felt sense which is “below”, so to speak, formulated faith, beliefs, or even concepts. It invites learners to question and temporarily suspend preconceived fixed ideas about themselves and the world and discover what a “beginners mind”⁴ might experience. Students are of course welcome to interpret and connect their experiences to their own faith or spiritual traditions, but the instructor never presents a spiritual point of view from the front of the class. Later in their learning journey, students are invited to discover how both ethical and effective action might arise from this kind of embodied learning and direct engagement with the world as it is. In 2003, Professor Arthur Zajonc of Amherst College and Contemplative Mind in Society described how transformative learning relates to ethics and social responsibility:

“We are particularly interested in ways that transformative learning can move beyond individuation to further the ethical and spiritual development of the learner. We are interested in the methodologies that facilitate such development, including reflective learning, experiential and participatory pedagogy, intuitive and imaginative processes, and contemplative practices. These methodologies, in the context of higher education, work toward the objectives of developing ethical and moral sensibility, cultivating a recognition of

² The mission of the PassageWorks Institute is to provide educators with evidenced-based frameworks, principles, and practices to develop and sustain their own professional practice, to enliven and improve classrooms, and to help teachers and school leaders foster positive and productive school climates.

³ The MA in Environmental Leadership trains students to lead creatively and compassionately from a strong inner foundation of self-knowledge. Under this new paradigm of leadership, our MA students are empowered to direct and manifest an emerging future that integrates multicultural perspectives, collaborative decision-making and cutting-edge environmental thinking on behalf of the earth and all living beings.

⁴ Suzuki, S., & Dixon, T. (1970). *Zen Mind, Beginner’s Mind* ([1st., p. 134 p.]. New York,: Walker/Weatherhill.

interdependence and a re-connection with the natural and social world, and an emergent sense of social responsibility.”⁵

There are a number of educational traditions and approaches that share methods and ideas with what we are discussing as transformative learning. Each of these traditions is complete in its approach, and there is no attempt in this paper to enclose and/or transcend these approaches. However, we will identify and emphasize some of these common elements below as a means of acknowledging and introducing these shared aspects of our approaches. **Experiential Education** includes the hands-on, real-world, direct, tangible aspect that is essential for transformative learning. **Service Learning** employs experiential approaches in its work to inspire and educate students about the intention and practice of community service, and demonstrates how the ‘community’ can operate as teacher. The **Action Research** model articulates the cycle of acting, observing, and reflecting and its founder Kurt Lewin was fond of saying, “You cannot understand a system until you try to change it.” **Character Education** has also made significant contributions to teaching students about cultivating prosocial intentions, and extoling the importance of human virtues and values. **Holistic Education** and **Contemplative Education** speak directly to educating the whole child or person. In addition, Contemplative Education offered at Naropa University emphasizes a dimension of directly addressing internal states of mind and perception. This inner level of mind training enables students to stabilize their attention and to loosen their grip on fixed notions about the world and themselves. **Social and Emotional Learning** (SEL), predominantly a K-12 pedagogy, also addresses the skills of self-awareness and self-management. In addition, SEL includes activities and lessons designed to develop social awareness, relationship skills, and responsible decision-making.⁶

Transformative learning in the American educational context has forerunners and current inspirations in the indigenous knowledge of the first peoples of this land⁷. There are also long honored roots of western education from the ancient Greeks that offer insights into how to develop the diverse aspects of human experience and behavior. There are important influences from Eastern philosophical traditions exemplified in Naropa’s contemplative approach and in the large number of new education programs employing martial arts, yoga and mindfulness. These traditions and many left unmentioned, illuminate a great variety of skillful methods to fully engage students in the journey of learning, personal, and social development.

⁵ Arthur G. Zajonc, Ph.D., (2003) Professor of Physics, Amherst College from Survey of Transformative and Spiritual Dimensions of Higher Education; p7: Prepared for the Fetzer Institute by The Center for Contemplative Mind in Society March 2003

⁶ “SEL is a process for helping children and even adults develop the fundamental skills for life effectiveness. SEL teaches the skills we all need to handle ourselves, our relationships, and our work, effectively and ethically.” from Collaborative for Academic, Social, and Emotional Learning (CASEL) <http://casel.org/why-it-matters/what-is-sel/>

⁷ Tewa professor and scholar Gregory Cajete offers some excellent views and perspectives on American Indian pedagogical goals and teaching methods.

“As contemplative educators, I believe that we are all engaged in an important project, one with a long tradition. The project of ancient philosophy was to live a right life, to embody virtue not only legislate it, to engender creativity and the capacities for insight, not only memorize formulae and works of art. As Hadot (the Greek scholar) puts it, their education was “a course of training which would make them simultaneously contemplatives and men of actions – since knowledge and virtue imply each other.”⁸

Throughout this paper we will use the term “transformative learning” as a name for our current working approach to an integrated teaching and learning process that accesses and activates the whole student. We will also offer several models that provide frameworks for both thinking about and applying transformative learning. We believe these models are helpful for conceptualizing the process, while acknowledging, “All models are wrong; some are useful.”⁹ We recognize and emphasize that “transformative teaching and learning” rests in the heart and practice of the teacher and, of course, in students’ innate desire and capacity to learn.

Sustainability and Education

One of the most commonly referenced definitions of sustainability comes from the 1987 Brundtland World Commission on Environment and Development and reminds us of the core concerns and goals: "To meet the needs of the present without compromising the ability of future generations to meet their own needs."¹⁰ Sustainability definitions combine concern for the carrying capacity of natural systems with the social challenges facing humanity via the "interdependent and mutually reinforcing pillars" of sustainable development defined as economic development, social development, and environmental protection¹¹. This definition has evolved to include a fourth pillar of culture, including the essential elements of environmental and social justice¹². Naropa MA Environmental Leadership student Karta Elise expressed such a holistic view of sustainability as part of her 2010 PassageWorks internship report:

“...Sustainability is a new worldview embodied by individuals and a growing collective, and is also an ongoing conversation co-creating our near and distant future. As a paradigmatic perspective, it acknowledges the crisis entire, accepts human responsibility, and willingly meets this challenge as an opportunity for a profound shift in human presence toward a more holistic or ecological paradigm in which not only ecology, equity, economy, but education, and ego are inextricably linked.” – *from final report for PassageWorks Institute internship Applied*

⁸ Zajonc, A. (2005). *Love and Knowledge: Recovering the Heart of Learning through Contemplation*. Columbia University - *Contemplative Practice and Education: Making Peace in Ourselves and in the World*. New York: Contemplative Mind in Society. Retrieved from <http://www.contemplativemind.org/programs/academic/eol.pdf>

⁹ A well known quote from George E. P. Box. That was popularized by W. Edwards Deming.

¹⁰ *Our Common Future: (Brundtland Report)*. (1987). World Commission on Environment and Development. Oxford University Press.

¹¹ From the The United Nations 2005 World Summit Outcome Document

¹² From the *The Universal Declaration on Cultural Diversity* (UNESCO, 2001)

What educational pedagogies will enable current and future generations of global citizens to hold such a global multi-generational view, practice the necessary skills, and engage in the right actions that will bring about a more sustainable world?

A Blind Spot in Our Society and in Our Pedagogy

Why is it that our current efforts to move towards sustainability seem to fall so short of the Brundtland, United Nations and UNESCO views? Part of the answer lies in what Francisco Varela and subsequently Otto Scharmer have referred to as a societal “blind spot”.

“The cause of our collective failure is that we are blind to the deeper dimension of leadership and transformational change. This “blind spot” exists not only in our collective leadership but also in our everyday social interactions. We are blind to the source dimension from which effective leadership and social action come into being. We know a great deal about what leaders do and how they do it. But we know very little about the inner place, the source from which they operate. Successful leadership depends on the quality of attention and intention that the leader brings to any situation.”¹⁴

A majority of U.S. education policies and programs focus on cognitive skills and knowledge and generally do not address social and emotional development. There are many good reasons for this emphasis on the rational mind. Individual, social and moral development are not as well understood as cognitive development, and in public education, there are also important First Amendment religious freedom concerns that arise when we begin to talk about personal meaning, values, and moral development.

The emerging series of developments in education, mentioned above, such as contemplative education, social and emotional learning, and transformative learning offer practical classroom methods that bridge the divide between those who are focused on cognitive academic standards and those who are calling for a greater emphasis on social competence, emotional intelligence, and cultivation of a rich inner life¹⁵. Current research trends in both neuroscience and education suggest that these subjective, inter-subjective and objective domains should not be viewed as separate competing interests, but are intricately linked in the healthy development of students as they mature into competent, caring, and ethical leaders. For example, in a recent meta-analysis of 213 school-based social and emotional learning (SEL) programs, involving 270,034 kindergarten through high school students, the students not only demonstrated significantly improved social and emotional

¹³ Elise, K. (2011). *Sustainability & Resilience at the PassageWorks Institute* (p. 36). Boulder, CO.

¹⁴ “Uncovering the Blind Spot Of Leadership”, Executive Forum: Leader to Leader. Winter 2008. by C. Otto Scharmer

¹⁵ By “inner life” PassageWorks refers to that essential aspect of human nature that yearns for deep connection, grapples with difficult questions about meaning, and seeks a sense of purpose and genuine self-expression.

skills, but their academic performance also reflected an 11-percentile-point gain in achievement.¹⁶ Understanding how these linkages work, and how we move from awareness and consciousness to language, behavior, and action is essential if we are going to illuminate this ‘blind spot’ in our society.¹⁷

“...we need to learn to attend to both dimensions simultaneously: what we say, see, and do (our visible realm) and the *inner place* from which we operate...collectively becoming aware of our inner places from which we operate in real time—may well be the single most important leverage point for shifting the social field in this century and beyond...”¹⁸In the following section, we will employ two models that will help us develop a better understanding of the outer and inner dimensions, which will lay the ground for how to address these different domains in the context of a classroom. The dynamic model that emerges from this exploration helps to explicate what we have learned from our first hand experience in transformative teaching.

Three Domains of Learning – Three Stages of Evolution of the Brain

One classic model for understanding the different dimensions of learning is Blooms Taxonomy of Educational Objectives. Bloom’s original taxonomy offers us three domains of learning as a framework for mapping a transformative pedagogy. A committee of colleges, led by Benjamin Bloom (1956), identified these three domains of educational activities as:

Cognitive: mental skills (*Knowledge*)

Affective: growth in feelings or emotional areas (*Attitude*)

Psychomotor: manual or physical skills (*Skills*)¹⁹

There is a complementary model in neuroscience to Bloom’s three domains of learning. Paul D. MacLean, a leading brain scientist over the past fifty years researched and articulated the “triune brain” and summarized his work in, *The Triune Brain in Evolution* in 1990.

“The triune brain model describes the progressive evolutionary development of three layers of the forebrain which MacLean believes can still be distinguished neuroanatomically and functionally in our own brain structure. He describes initially a "reptilian complex" which surrounds the midbrain and which probably evolved several million years ago. It relates to such primal instincts as sex, survival, and aggression. This is surrounded by a limbic system that is fully developed in mammals, but not in reptiles. He relates the limbic system primarily to emotions and a social capacity other than primal hierarchy. Surrounding the rest of the

¹⁶ Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The Impact Of Enhancing Students’ Social And Emotional Learning: A Meta-Analysis Of School-Based Universal Interventions. *Child Development*, 82(1), 405-432.

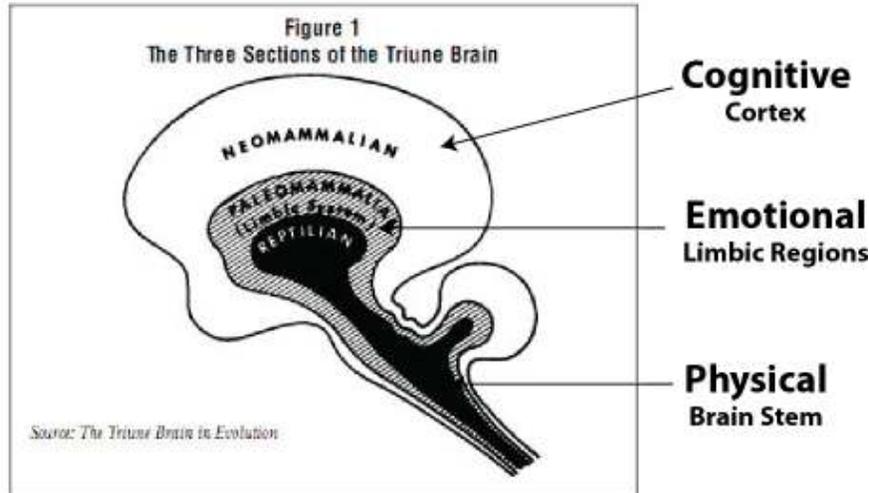
¹⁷ From “Leadership in the Context of Emerging Worlds: Illuminating the Blind Spot” W. Brian Arthur, Jonathan Day, Joseph Jaworski, Michael Jung, Ikujiro Nonaka, C. Otto Scharmer, Peter M. Senge

¹⁸ Scharmer, C. O. (2009). *Theory U: Leading from the Future as It Emerges* (p. 533). Berrett-Koehler Publishers. p. 10

¹⁹ Bloom B. S. (1956). *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain*. New York: David McKay Co Inc.

brain is the neo-cortex, which in humans makes up by far the largest portion of the brain and is associated with reason.”

Below is the diagram from MacLean’s 1990 book, *The Triune Brain in Evolution: Role in Paleocerebral Functions* with annotations added for Blooms three domains of learning.²⁰



The Triune brain model has received considerable critique and revision over the past forty years, and is an extremely simplistic model to describe the many different functional areas of the brain and how they interact. However, it remains a useful metaphor to shed light on how “adaptation to our environment” or “learning and development” has evolved over millions of years, and how humans continue to learn and adapt using many functional areas of our nervous system that are not all located in the more recently evolved cortical regions²¹. **What is most relevant and significant is that these different functional areas respond to stimuli and ‘learn’ in quite different ways.**

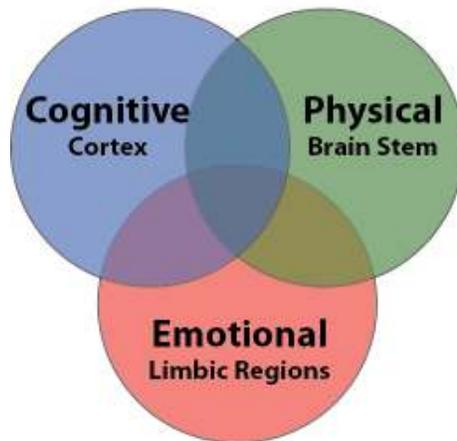
Below is a table associating the Bloom learning domains with the original MacLean brain layers.

Blooms Taxonomy	MacLean’s Triune Brain
Cognitive: mental skills (Knowledge)	New Brain - Neomamallium - Neocortex - Thought (including planning, language, logic & will, awareness)
Affective: growth in feelings or emotional areas (Attitude)	Mid Brain - Palloemammalian –R Complex- Limbic System - Emotion (feelings, relationship/nurturing, images and dreams, play)
Psychomotor: manual or physical skills (Skills)	Old Brain - Archipallium - Reptilian Brain - Instinct (survival, breathing/swallowing/heartbeat, startle response)

²⁰ MacLean, P. D. (1990). *The Triune Brain in Evolution: Role in Paleocerebral Functions*. Springer. p. 9

²¹ We know that the immune system, like the central nervous system, has memory and the capacity to learn. Thus, it could be said that intelligence is located not only in the brain but in cells that are distributed throughout the body, and that the traditional separation of mental processes, including emotions, from the body is no longer valid. From Pert, Candace. (1999) *Molecules of Emotion: the Science behind Mind Body Medicine*. P 187

Domains of Learning and “Triune Brain”



Of course, these domains are in reality part of a continuum of human experience, and the various layers and functional areas of the brain are highly interconnected. We know that most significant activities in life involve the integration of multiple learning domains.²² However, an important question remains: Are these non-traditional dimensions of learning and experience legitimate and appropriate domains to be addressed in formal educational contexts?

Confronting the Taboo of Subjectivity

Formal education is a consensus driven process, and yet a great deal of our experience is personal. The challenge we face in engaging these multiple domains, is that much of our behavior is directly shaped by these personal aspects of experience and knowledge, but first-person experiences such as empathy, feeling and awareness are largely viewed as impossible to consensually verify, and therefore unreliable. Alan Wallace has referred to this mistrust of first-person knowledge as western culture’s “taboo of subjectivity.”

“While science has enthralled first Euro-American society and most of the world with its progress in illuminating the nature of the external, physical world, I shall argue that it has eclipsed earlier knowledge of the nature of the inner reality of consciousness. In this regard, we in the modern West are unknowingly living in a dark age.” From *The Taboo of Subjectivity* by B. Alan Wallace²³

How can we rigorously engage our first person experiences and validate those experiences in an educational context? Cognitive scientist Francisco Varela and colleagues have explored this dilemma and have proposed a “learning and validation” framework to help understand and design first-person learning methodologies.

²² Wilensky, R., & Wilding, M. (2010). What Is Contemplative Education? (unpublished) Boulder, CO.

²³ Wallace, B. A. (2004). *The Taboo of Subjectivity: Toward a New Science of Consciousness* (p. 218). Oxford University Press.

mutual, holistic existence of two beings. This is an invitation to pure presence. Ironically, according to Buber, the I/It relationship is in fact a relationship with oneself; it is not a dialogue, but a monologue.²⁶

The vignette below offers a glimpse into a teachable moment illustrating the transformative process of learning when the teacher and the student are willing to engage “subjective” emotional experience as valuable, relevant, and worthy of exploration.

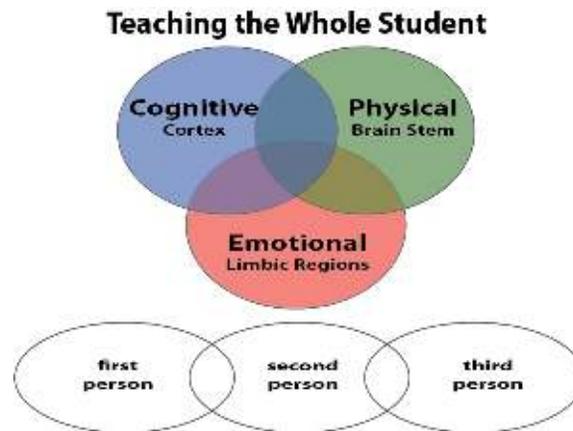
Giving permission for emotions can open a path of learning. “So what are some of your first impressions of this new approach to the story of science?” I asked a mature group of Masters in Environmental Leadership students after viewing some work by mathematical cosmologist Brian Swimme and cultural historian Thomas Berry on the new scientific story of the universe. “I hate it” a bright young MA student piped up, “In fact I hate it, I hate it, I hate it” she exclaimed passionately. Her statement surprised me and literally stopped my mind. A bit taken aback I peered to my left at the visiting research scholar sitting next to me to see her reaction to her first visit to our program. “Well, okay. Hate is not neutral. Stay with that feeling, look into it over this week and tell me what you notice when you come back to class next week” I said. Next week the student spoke up right away saying “I realized the new material totally challenges the world view that my grandmother had taught me about how the universe and the earth are operating and I was afraid that if I abandoned her view I would lose her love. Once I understood that, I was okay to find my own way, my own understanding. Everything opened up for me to learn and still love her”

Addressing the emotional domain also supports students to develop their capacity for emotional self-regulation and increase their ability to attend and focus on what they choose.

Teaching the Whole Student

How can we as educators engage the cognitive, emotional, and physical learning domains described above, and support students in learning from different perspectives along first-person third-person continuum? Conventionally, teachers transmit knowledge and develop skills within cognitive and physical domains (including the arts) through direct instruction. In this broader view of education presented here, didactic teaching remains essential, however, when it comes to helping a student “know thyself” and reflect on their own first-person experiences of attention, awareness, and felt senses, ‘facilitative instruction’ is an essential complementary modality of teaching. This second-person mentor or tutor approach provides contexts within which students notice and begin to make sense of their feelings, develop their emotional intelligence, and express their insights and understanding about their ‘inner life’ in their own language and frameworks.

²⁶ Buber, M., w Ronald Gregor Smith translator. (2000). I and Thou. Scribner.



The diagram above depicts engaging the whole student in the transformative learning process—the brain/mind/body—the cortex, the limbic regions and the brain stem, utilizing the full range of human experiences in a social network from first-person to third-person.

This facilitative approach also helps teachers avoid proselytizing about their own views because it invites students to explore their own experiences and express their insights in their own language and frameworks. This supports students to engage these deeper dimensions of their lives without infringing on the 1st Amendment rights of students and their families. Of course, parents or guardians are always children’s first “teachers” and students depend on their families’ personal, social and economic resources, as well as their ecological knowledge. We recognize that young people learn in multiple contexts – families, schools, communities and popular culture and a wide range of individuals assume the role of mediators of youth learning.

Cultural Responsiveness in the Classroom

Engaging the whole student will certainly surface such cultural contexts, and provides a powerful way to explore cultural identity and cultural responsiveness in the classroom. Students arrive in our classrooms with their accumulated lifetime of knowledge and experiences and it is a critical that we as educators know how to respectfully engage and support all the students we teach, regardless of how similar or different our backgrounds might be. No model or conversation on transformative learning and accessing the whole person could be considered sufficient if it did not address cultural diversity and responsiveness:

“Cultural responsivity refers to the ability to learn from and relate respectfully to people from your own and other cultures. It includes adjusting your behaviors based on things that you learn about other cultures. It requires openness to experiencing and thinking about things from other points of view.”²⁷

²⁷ Zion, Shelley & Elizabeth Kozleski, Mary Lou Fulton (2005) - “Understanding Culture”.
http://www.niusileadscape.org/docs/FINAL_PRODUCTS/LearningCarousel/Understanding_Culture.pdf

Exploring cultural identity and cultural perceptions in a classroom can be challenging for educators and students. Transformative learning methods have the potential to positively support this work; because of the skill building that occurs in working with emotions, in deep listening, and in conscious expression.

“When teachers integrate social and emotional learning activities into the curriculum, students get to know each other personally in meaningful contexts, allowing social masks and conditioned roles to more easily drop away. From this place of authenticity and freshness, students are more able to see each other with openness and relate to each other with compassion.”²⁸

In turn, working with cultural difference and issues of power and privilege with students who have developed an increased capacity for empathy and emotional self-regulation can be a powerful driver of transformative learning. Engaging a student at the level of “who they are” contextualizes learning in a way that makes education more meaningful and relevant.

“The whole class, every single student, was really present. They sat in the circle really listening to each other. They are beginning to really care about each other, even with their differences. They are respecting each other. A group of twenty-five 10th graders, from such different social groups sitting together at 8:20 in the morning really being present and listening to each other. That is powerful. “ – 10th grade advisor²⁹

Finally, we have found that the facilitative second-person approach is also valuable in context of teaching cognitive content, because it is more generative and cultivates a student’s personal motivation and responsibility for learning. This can lead to a more sustainable and perhaps life-long learning disposition not only toward the subjects studied but also toward the internal processes involved in learning itself, i.e. **“learning to learn”**.

Transformative Teaching

We emerge from our exploration of the different domains and dimensions of transformative learning with an awareness that teachers play a critical role in the learning journey of students. As teachers and learners we need to literally “be in conversation with” the many dimensions of the brain/body as they connect to self, other and the world. In fact, there is good evidence that the brain/body is ‘hardwired to connect.’³⁰ As UCLA Professor Daniel Siegel writes in *Mindsight: The New Science of Personal Transformation*:

²⁸ Weaver, L. et al (2012) From forthcoming PassageWorks book tentatively entitled *The Five Dimensions of Engaged Teaching*

²⁹ Comment from 10th grade advisor on using PassageWorks curriculum in high school in New York

³⁰ Kline, K. K. (2008). *Hardwired to Connect: Authoritative communities: the scientific case for nurturing the whole child* (p. 386). Springer.

“The limbic area is also crucial for how we form relationships and become emotionally attached one another... We are hardwired to connect with one another thanks to our mammalian heritage.”³¹

We are learning that these conversations with the different layers of our brain require different “languages.” Teaching methods that work well for cognitive learning do not work when we are asking to students to engage their emotions or physical body. Darcia Narvaez captures this communication challenge in the following quote from her article about the neurobiological roots of morality:

“People rely on intelligence to solve problems, and they are naturally baffled when comprehension proves impotent to effect emotional change. To the neocortical brain, rich in the power of abstractions, understanding makes all the difference, but it doesn’t count for much in the neural systems that evolved before understanding existed. Ideas bounce like so many peas off the sturdy incomprehension of the limbic and reptilian brains.”³²

Learning about the different languages of the brain/body and how to incorporate this knowledge into the classroom can have a powerful impact on a student’s overall learning journey. For instance, introducing cognitive models and theories can provide scaffolding or maps for students to engage in emotionally challenging topics, while in another context, reflecting on emotions and feelings can surface learning obstacles that are based on difficult past experiences. Pedagogical elements suited to engaging the emotional domain include journaling, dialogue work, and personal stories. When “feelings” are welcomed as a part of the natural human condition, it is possible to notice habitual patterns and open to new learning. Addressing the emotional realm, while less familiar or permissible in standard educational settings, is now better understood and more valued with increasing public discussion of “emotional intelligence.”

“Emotional intelligence is born largely in the neurotransmitters of the brain’s limbic system, which governs feelings, impulses, and drives. Research indicates that the limbic system learns best through motivation, extended practice, and feedback.” - Daniel Goleman³³

Social Ethical – An Emergent Fourth Domain of Learning

Our experience in using this integrated first-person/third-person – triune brain approach, is that the different perspectives and domains of learning interact in synergistic ways and create an accelerative effect between direct experience, expression, learning, embodiment, and action. As students explore and discover the interconnected and interdependent nature of the world they live in, they often report an increase in sensitivity for the pain and suffering of others. These empathetic experiences can lead to a natural ‘reaching out’ and care and compassion for others. When exposed to the

³¹ Siegel, D. J. (n.d.). *Mindsight : The New Science of Personal Transformation* (1st ed., p. 2010). New York: Bantam Books. p.17

³² Narvaez, D. (2008). Triune ethics: The neurobiological roots of our multiple moralities. *New Ideas in Psychology*, 26(1), 95-119. Elsevier.

³³ Goleman, D. (1998). *What Makes a Leader?* Harvard Business Review, November-D.

complex interdependence of systems students learn not only about the dynamics of change, but they also learn how their well-being depends on the well-being of members of their community. This ‘prosocial behavior’ or sense of connecting to themselves, to others, and to the world around them not only enhances the learning process, but it also supports a student in developing an embodied or experienced ethical ground for action—or what we might call a fourth Social Ethical Domain of Learning.

Patricia Jennings and Mark Greenberg have proposed a model of a “prosocial classroom” that emphasizes “the importance of teachers’ social and emotional competence and well-being in developing and maintaining supportive teacher–student relationships, effectively managing their classrooms, and implementing SEL (social and emotional learning) programs effectively.” Jennings and Greenberg suggest that this prosocial classroom climate is not only “more conducive to learning,” but that it also “promotes positive developmental outcomes among students.” Below is a logic model for their research that shows how these emotional, social, and academic elements interrelate in a classroom context.³⁴

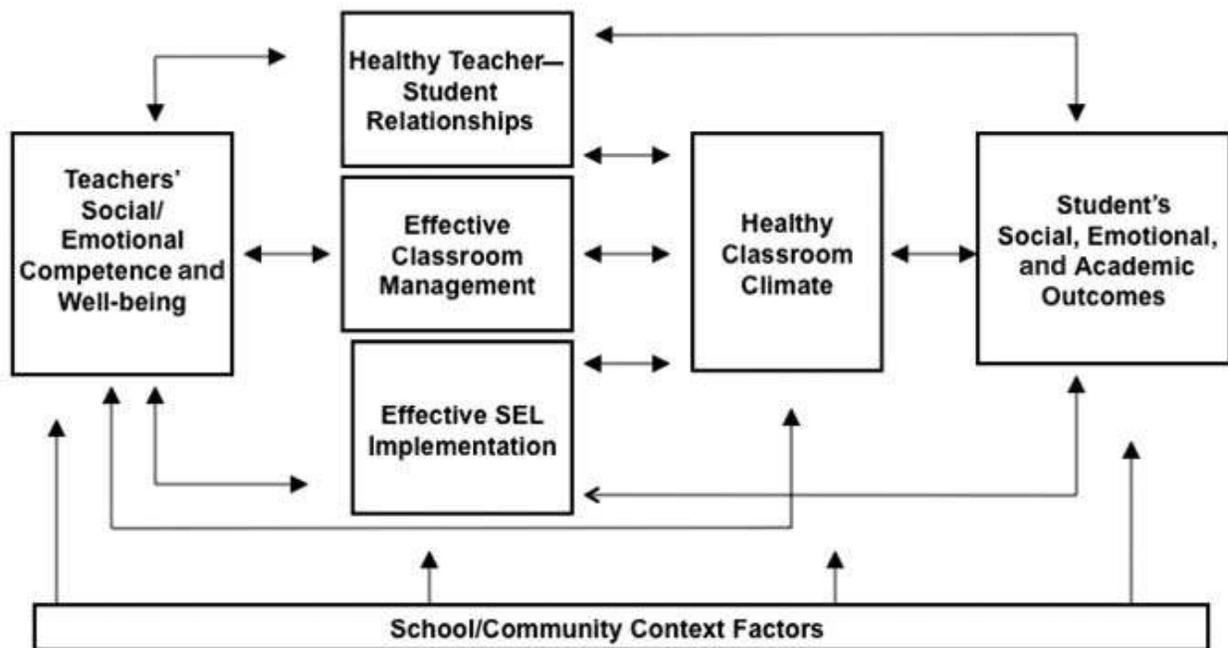


FIGURE 1. The prosocial classroom: A model of teacher social and emotional competence and classroom and student outcomes.

³⁴ Jennings, P. A., & Greenberg, M. T. (2009). The Prosocial Classroom: Teacher Social and Emotional Competence in Relation to Student and Classroom Outcomes. *Review of Educational Research*, 79(1), 491-525. doi:10.3102/0034654308325693

We view this fourth Social Ethical Domain of Learning as an emergent property arising out of the integration and interaction of the other three domains. Darcia Narvaez's research at Notre Dame has focused on understanding the role of the brain in developing moral behavior. Narvaez has described how the 'three formations' operating together to create the conditions for "Triune Ethics."

"Triune Ethics Theory (TET) derives its name and inspiration from MacLean's (1990) Triune Brain theory which proposes three basic formations in the human brain that reflect ancestral relations to lower-order species... In humans, the formations are intertwined (hence "triune" and not "tripartite"); each newer circuit exploits and builds upon the propensities of the older. Nevertheless, each has a unique footprint that can be identified in human behavior. TET proposes that these footprints mark moral behavioral tendencies as well."³⁵

It is important to note in a discussion about moral behavior and ethics, that a great deal of our behavior does not get processed or filtered through our cortex with its rational frameworks and models, and is more like an "immediate coping with what is confronting us" as cognitive scientist Francisco Varela refers to it.

"In summary, then, my main point is that most of our mental and active life is of the immediate coping variety, which is transparent, stable, and grounded in our personal histories. Because it is so immediate, not only do we not see it, we do not see that we do not see it, and this is why so few people have paid any attention to it..."³⁶

Varela makes the point that a great deal, in fact a majority of our behavior does not pass through rational filters based on codes of conduct or ethical frameworks. Our reactive thoughts and behavior appear to arise out of a deeper place in our brain/mind/body complex. What is motivating us to act in these cases is not a thoughtful rational weighing of alternatives, but more like an instinctual impulsive response.

"The brainstem is also a fundamental part of what we called "motivational systems" that help us satisfy our basic needs for food, shelter, reproduction, and safety. When you feel a deep "drive" to behave in a certain way, chances are that your brainstem is working closely with your next higher region, the limbic area, to push you to act."³⁷

Building upon Varela's discussion on coping type behavior, if our pedagogy is going to have a significant impact on moral development, we will want to address the layers of the brain that effect both coping behavior and rational thoughtful action. Professor Narvaez addresses this in the conclusion of "Triune Ethics" paper:

³⁵ Narvaez, D. (2008). Triune ethics: The neurobiological roots of our multiple moralities. *New Ideas in Psychology*, 26(1), 95 -119. Elsevier.

³⁶ Varela, F. J. (1999). *Ethical Know-How : Action, Wisdom, and Cognition*. Writing science. Stanford, Calif.: Stanford University Press.

³⁷ Siegel, D. J. (n.d.). *Mindsight : The New Science of Personal Transformation* (1st ed., p. 2010). New York: Bantam Books. p. 17

“The experiences that build moral orientations are complex and extensive. Morality is not based in learning rules, per se. Rather, it is a matter of building physiological activation patterns, ‘knowledge of the structure of social space, and how to navigate it effectively’ (Churchland, 1998, p. 86), developing unconscious ‘somatic markers’ (Damasio, 1994) for what are good and not-so-good actions, and developing the capability for limbic resonance with others for a satisfying social life (Lewist et al., 2000).”³⁸

New York Times Columnist David Brooks, a keen observer and writer on U.S. policy and politics describes the importance of “the inner working of the human mind” in his new book *The Social Animal* in this way:

“Over the past few decades, geneticists, neuroscientists, psychologists, sociologists, economists, and others have made great strides in understanding the inner working of the human mind. Far from being dryly materialistic, their work illuminates the rich underwater world where character is formed and wisdom grows. They are giving us a better grasp of emotions, intuitions, biases, longings, predispositions, character traits, and social bonding, precisely those things about which our culture has least to say. Brain science helps fill the hole left by the atrophy of theology and philosophy. A core finding of this work is that we are not primarily the products of our conscious thinking. The conscious mind gives us one way of making sense of our environment. But the unconscious mind gives us other, more supple ways. The cognitive revolution of the past thirty years provides a different perspective on our lives, one that emphasizes the relative importance of emotion over pure reason, social connections over individual choice, moral intuition over abstract logic, and perceptiveness over I.Q. It allows us to tell a different sort of success story, an inner story to go along with the conventional surface one.”³⁹

Cognitive Scientist Francisco Varela sums up his view of ethics in his book *Ethical Know-How: Action, Wisdom, and Cognition* where he offers insights into the link between this deeply embodied level of ethics and the emerging action and service that arises from it:

“Ethics is closer to wisdom than reason, closer to understanding what is good than to correctly adjudicating particular situations....As a first approximation, let me say that a wise (or virtuous) person is *one who knows what is good and spontaneously does it*”⁴⁰

There is an important place in our society for rules and laws and moral codes, but our experience in the classroom has also shown us that there is an equally important place for engaging what Otto Scharmer refers to as the “quality of intention and attention.” We have seen in our classrooms that addressing sustainability in the context of an emergent embodied ethical domain of learning can lead to the personal transformational change needed to illuminate our “blind spot” in both our collective

³⁸ Narvaez, D. (2008). Triune ethics: The neurobiological roots of our multiple moralities. *New Ideas in Psychology*, 26(1), 95 -119. Elsevier.

³⁹ Brooks, D. (2011, January). “Social Animal: What the science of human nature can teach us.” *New Yorker Magazine*. New York, N.Y. Retrieved from <http://www.newyorker.com>

⁴⁰ Varela, F. J. (1999). *Ethical Know-How : Action, Wisdom, and Cognition*. Writing science Stanford, Calif.: Stanford University Press. p. 3-4

leadership and in our everyday social interactions, lifting the veil that has obscured our awareness of how to find a healthy, dynamic way forward.

The Practice of Transformative Learning

Transformative teaching is itself a reflective practice and includes on-going experimentation and assessment of the impacts of teaching methods and assignments. Each learning domain “responds to a different language,” meaning that teachers must address these domains in different ways. We offer here a framework for addressing each of the three domains, as well as the fourth emergent domain on an inner and an outer level. Our purpose is to offer some starting points for how assignments and activities might be designed in order to achieve our desired learning outcomes. There are of course a myriad of specific methods and possible outcomes; the suggestions shown here are intended to spark thinking and inspire further creativity.

Note Bene: Regarding the table below: The purpose of many of the distinctions made in the following table are somewhat arbitrary, and were chosen to focus attention on the ways in which educators might engage the various domains of knowledge and learning outcomes. In practice, each of these activities engages the whole student at various levels of depth and breadth. Educators typically integrate these activities into a course of study with careful attention to scope, sequence, and the developmental stages of individuals and groups. It is important to employ ongoing formative assessments in order to assess the student learning outcomes of the program of study as a whole.

	INNER LEARNING DIMENSIONS		OUTER LEARNING DIMENSIONS	
LEARNING DOMAINS (triune brain)	Assignments & Activities Via 2 nd Person	1 st Person Learning Outcomes [I –Thou]	Assignments & Activities Via 2 nd Person	3 rd person Learning Outcomes [I – It]
Cognitive (Cortex)	Mindfulness/awareness meditation Silence and solitude “Active focusing” exercises	Stability of attention, focus, openness Familiarity with thinking process	Lectures, presentation, readings Research papers Discussions	Conceptual understanding, vocabulary, frameworks and models Pattern recognition
Emotional (Limbic)	Tonglen – ‘sending and taking’ (an empathy based breath/ meditation technique) Deep listening exercises Wilderness solo retreat	Empathy, sympathy, awe and wonder	Personal story telling Reflection papers Journals	Awareness and articulation of the role and messages of emotions Emotional intelligence (EI)
Physical (Brain Stem)	Sensory Awareness exercises Focusing exercises (Eugene Gendlin) Tai Chi, Aikido, Yoga	Attention to physical sensations and connection to intuition	Service learning projects Art work assignments	Recognizing body signals skill mastery
Social Ethical (emergent) (Integrated synchronized mind)	Council practice Mindful dialogue exercises	Compassion, prosocial intentions Humility Trust	Research and Writing Service learning projects Debriefs & after-action reports	Illuminate social issues, interconnectedness Consensus building Clear intentions for community service and skillful collaborative action

We see the table above as a work in progress. It is our aspiration that it serves to inspire a sense of creativity in exploring transformative learning in curriculum design and in the experience of teaching. The real work, of course, goes on in the classroom. We now turn to look at a sample class at the university level⁴¹:

Classroom Example⁴²: Teaching the New Science Course

Every class in the Masters Degree in Environmental Leadership at Naropa University seeks to enhance the students' understanding of sustainability, each in a unique way. We explore here one course, entitled *the New Science and its Cultural Implications*. This semester long new science course introduces students to new perspectives in science, such as the Universe Story by Brian Swimme and Thomas Berry and Gaia Theory from James Lovelock, that address our self-organizing universe and our living, self-regulating earth with the goal of inviting a shift of ecological consciousness on a personal and cultural level to move towards an ecologically sustainable, socially just and life sustaining future. Students are invited to embody, think and feel from this new paradigm, leading to a felt sense of ecological ethics born not of denial or beating ourselves up about ecological destruction, but one coming out of love, commitment and a felt sense of inter-being.

The course typically addresses the three domains of learning in sequence. Initially (particularly in the very first classroom period) the ground of learning is put forward in a lecture or orienting statement, clarifying the learning topic and goals. In the case of teaching the new science course as described in the story earlier in the paper, this means initially laying out the historical context of the new science topics including the logic and research that shape our understanding of the new material.

“After reading the Universe Story I felt re-oriented. Why wasn’t I taught this before? It would have changed everything” a student’s comment after reading the *Universe Story* by Brian Swimme and Thomas Berry.

This cognitive engagement is followed by addressing the emotional realm with, for example, an opportunity for the students to speak for themselves. This can be done in the form of writing thoughts down in class and then sharing what emerged, or in direct conversation. Conversation

⁴¹ ⁴¹ Since our collaboration as institutions focuses on the university level of education we emphasize it here. Passageworks’ forthcoming book tentatively entitled *Engaged Teaching* provides further insight on transformative learning in K-12 classrooms.

⁴² At Naropa University professors in all disciplines are engaged in developing their own approach to transformative and contemplative education in ways that uniquely suit their programs and disciplinary pedagogies. The outcomes of the experimentation and application of diverse techniques across the disciplines have been rich and inspiring. While there may be no typical class structure that could be cited as consistent across the University, in keeping with the diversity of learning expected at a university level, here we take a look at a sample course in teaching new science to get a glimpse of transformative educational processes in the context of sustainability education.

often works best in small groups so that students can have some time to fully express their own views. Dyads in which each student gets to reflect in an uninterrupted way for several minutes while the other listens are also effective. Slightly larger groups of 3 or 4 in which each person gets to speak briefly before the group brainstorms the topic together is another option. In the case of the new science class students can be asked to reflect on their prior understanding in the topic and how it was shaped by cultural or other factors, brainstorm the implications or applications of the new information, or discuss how they feel about it or how it shapes their daily behavior. This level of interactivity is a significant departure from sitting in a large lecture hall listening to one person, while reflecting inside one's head and waiting for a subsequent opportunity to talk with fellow students. Report outs from the groups can often help students cross reference with the diverse views within the class and gain additional insights. In some cases this is appropriate to the topic; in others it is not necessary.

"I saw how important my story of the universe is. It felt so tender to be asked to write the story I would tell my 7 year old nephew. How did the story I was told affect me? What would I wish for him? It was hard to write it down, but it moved me deeply and made me feel a sense of responsibility for a healthy world, a healthy future" Comments of a student reflecting on a class exercise about writing his own version of the story of how the universe came into being.

It is useful to note that in teaching the new science one of the biggest emotional barriers is anger or disdain for the modern scientific culture, as demonstrated in the vignette earlier in this paper. While many environmental topics bring up grief and fear, in this course, students often discover their anger about science and a sense of a "dead" world that they have experienced. Interestingly it is not just the students who are less experienced with science, but also highly trained students who often need to confront this sense of despair and anger in order to move forward in their learning.

Next a reflective exercise gives space to address the deeper levels – whether it is a period of silent sitting or an occasion to lead a visualization or somatic exercise. This is an area that requires the most skill to coordinate with the material at hand. Setting up a learning environment in which the students know and trust the purpose of this is essential, although often they quickly find these moments so rewarding and memorable that they come to look forward to it in short order. In the new science context, students can be invited to sit quietly observing natural processes, engage in groups to act out the behavior of molecular formations, laws or principles, or visualize a moment in their childhood where they learned about the natural world etc. Often following this there may be shared comments or not depending in the context. The real learning here takes place at the somatic level where students access a felt sense of what they are learning.

"My relationship with everything is different. I don't have words for it exactly. I feel a relationship with the trees, the bushes, everything around my nature spot. I don't know. I feel at home in some

new way.” a student commenting after nature based meditation exercises in a chosen semester long nature spot.

The class often ends with some open discussion of the overall material and plans for homework that provide additional opportunities for informational, conversational and reflective practices. It may be important to begin with a cognitive process if students are unfamiliar with this type of learning, but once the semester is underway and students recognize and trust the domains of learning as valuable to their education, the sequence does not need to follow this order. In fact we often we start a class by immersing the students in a felt experience, then finding language for it, and later accessing a cognitive level of knowing. Reading usually takes place between classes so that a next step in the classroom may be to address the emotional or somatic domains. The order of learning activities may also be driven by the particular material. Well designed experiential exercises can support students in the process of engaging material on the intellectual, emotional and somatic levels– inviting creative brainstorming, new insights, designing new models or discovering emergent properties. This is particularly valuable in the area of new science where more sustainable approaches, ethical designs and life enhancing perspectives can emerge. This discussion leads to an important pedagogical question: **What is the highest and best use of classroom time?**

Following engagement with the three domains, the fourth domain of social and ethical emergent properties and behaviors often begins to manifest naturally in research and action projects in which students are not only thinking from new perspectives, but also acting with empathy, respect and attention to complexity. Students quickly begin to teach each other and design their own learning processes as they become familiar with these diverse and integrated modes of learning.

Learning Outcomes

The educational outcomes from the transformative learning processes described above include intermediate outcomes that are at once hard to measure, yet immediately noticeable in student behavior. Individual and social learning are affected and enhanced by these outcomes. Among them are qualities of calmness, kindness, awareness, and attention, as well as others noted in the table above. These increased capacities for awareness and openness to others further manifests in abilities for self-reflection, self-regulation and mindful communication. Students develop increased levels of emotional intelligence and these emerging qualities are often self-reinforcing.

The open exploration of students’ relationship with themselves, with others, and with the natural world in combination with activities such as meditation, empathetic listening, and dialogue generally leads to an overall felt sense of interconnection. This experience of the interconnected nature of the world often results in an experience of mutual interdependence and an emergent ‘inside-out’ ethical framework. While each student learns and evolves at their own rate and human behavior is complex and imperfect, these capacities begin to arise and students can develop a much deeper trust not only

of the learning environment, but also of themselves and others. This supports students to take risks and change their habitual patterns of thinking and behavior.

The qualities and capacities that emerge in the short term evolve into long-term outcomes, affecting the classroom and ultimately the whole learning environment. Students can manifest as healthy resilient young people, ethical knowledgeable citizens and engaged sustainability minded community members. We have experienced in our work how transformative learning can lead to this fundamental shift in students' skills, attitudes, and intentions—transforming their view of how to treat themselves, others and the world. Students who are healthy and confident in their abilities to learn and understand the world and who are aware of their interdependence with all life are well prepared to undertake the task of mindfully co-creating our near and distant future.

Summary

In this paper we have sought to describe and explain how the processes of transformative learning can access a level of *direct experience* that is inherently interfaith, operating “below” the level of formulated faith. It invites learners to a place of naturally arising ethics and compassion where effective action and service originates. In this way we can shed light on our collective “blind spot” in addressing the challenge of living sustainably on the earth, by accessing a deeper dimension of leadership and transformational change—illuminating the “source dimension from which effective leadership and social action comes into being.”⁴³

In this inquiry we have built upon Bloom's taxonomy of the three domains of learning: Cognitive, Emotional, and Physical as the doorways to access the whole person in the learning process. We have further drawn on the complementary view in neuroscience of the triune brain that describes a progressive evolutionary development of capacities for learning, as an effective model to use when designing a transformative learning processes—both in terms of addressing students' states of mind and in designing activities and assignments. We have considered and offered language that not only challenges the taboo of subjective dimensions of teaching and learning, but also shows how essential this approach is in educating the whole person. We have suggested a forth emergent domain of learning and education, that of the Social Ethical domain, as the ground for the deeper levels of personal and cultural transformation. The dynamic process of the learning sequences described in this discussion paper reminds us that education for sustainability cannot be reduced to a one-size fits all curriculum or pedagogy, but requires a continuous cycle of action, reflection and learning that informs our relationship to self, society and the earth.

⁴³ “Uncovering the Blind Spot Of Leadership”, Executive Forum: Leader to Leader. Winter 2008. by C. Otto Scharmer

Bibliography

- Bloom, B. S. (1984). *Taxonomy of Educational Objectives Book 1: Cognitive Domain [Paperback]*. Addison Wesley Publishing Company; 2nd edition edition.
- Brooks, D. (2011, January). What the Science of Human Nature Can Teach Us. *New Yorker Magazine*. New York, N.Y. Retrieved from http://www.newyorker.com/reporting/2011/01/17/110117fa_fact_brooks#ixzz1ZSYXyQnu
- Buber, M. (2000). *I and Thou* (p. 128). Scribner.
- Cajete, G. (1994). *Look to the Mountain : An Ecology of Indigenous Education* (1st ed., p. 243 p.). Durango, Colo.: Kivakâi Press.
- Cajete, G. (2000). *Native Science : Natural Laws of Interdependence* (1st ed., p. xii, 315 p.). Santa Fe, N.M.: Clear Light Publishers.
- Depraz, N., Varela, F., & Vermersch, P. (2003). *On Becoming Aware : A Pragmatics of Experiencing. Advances in consciousness research ; v. 43.* (p. viii, 281). Amsterdam ; Philadelphia: John Benjamins Pub.
- Edwards, A. R., & Orr, D. W. (2005). *The Sustainability Revolution: Portrait of a Paradigm Shift* (p. 224). New Society Publishers.
- Elise, K. (2011). *Sustainability & Resilience at the PassageWorks Institute* (p. 36). Boulder, CO.
- Goleman, D. (1998). What Makes a Leader? *Harvard Business Review*, November-D.
- Goleman, D. (2000). Leadership That Gets Results. *Harvard Business Review*, (March-April).
- Goleman, D., Boyatzis, R. E., & McKee, A. (2002). *Primal leadership: realizing the power of emotional intelligence* (p. 306). Harvard Business School Press.
- Hanh, T. N. (1987). *Interbeing: Fourteen Guidelines for Engaged Buddhism* (p. 116). Parallax Press.
- Jennings, P. A., & Greenberg, M. T. (2009). The Prosocial Classroom: Teacher Social and Emotional Competence in Relation to Student and Classroom Outcomes. *Review of Educational Research*, 79(1), 491-525. doi:10.3102/0034654308325693
- Kessler, R. (2000). *The Soul of Education: Helping Students Find Connection, Compassion, and Character at School* (p. 181). ASCD.
- Kessler, R. (2000). The Teaching Presence. *Virginia Journal of Education*, 94(2), 4.
- Kline, K. K. (2008). *Authoritative Communities: The Scientific Case for Nurturing the Whole Child* (p. 386). Springer.
- Lahey, L. L., & Kegan, R. (2001). The Real Reason People Won't Change. *Harvard Business Review*, 79(10), 85-92. Harvard Business School Publication Corp.
- Liddell, D. L. (2007). Ethical Identity and Moral-Related Variables: Spotlight on Darcia Narvaez, Tonia Bock, and Anna Gomberg. *Journal of College and Character*, 9(1), 1.
- MacLean, P. D. (1990). *The Triune Brain in Evolution: Role in Paleocerebral Functions* (p. 672). Springer.
- Macy, J. (1991). *World as Lover, World as Self* (p. xii, 251 p.). Berkeley, Calif.: Parallax Press.
- Macy, J., & Brown, M. Y. (1998). *Coming Back to Life : Practices to Reconnect Our Lives, Our World* (p. xvi, 223 p.). Gabriola Island, BC, Canada ; Stony Creek, CT: New Society Publishers.
- Maturana, H. R., & Varela, F. J. (1988). *The Tree of Knowledge : The Biological Roots of Human Understanding* (1st ed., p. 263). Boston: New Science Library : Distributed in the United State by Random House.
- Narvaez, D. (2008). Triune Ethics: The Neurobiological Roots of Our Multiple Moralities. *New Ideas in Psychology*, 26(1), 95-119. Elsevier.
- Narvaez, D. (2008). Human Flourishing and Moral Development: Cognitive and Neurobiological Perspectives of Virtue Development. *Handbook of moral and character education*, 310. Psychology Press.

- Narváez, D., & Lapsley, D. K. (2009). Triune Ethics Theory and Moral Personality. *Personality, Identity, and Character: Explorations in Moral Psychology* (pp. 136–158).
- Newman, J. D., & Harris, J. C. (2009). The Scientific Contributions of Paul D. MacLean (1913-2007). *The Journal of Nervous and Mental Disease, 197*(1).
- Our Common Future: (Brundtland Report). (1987). *World Commission on Environment and Development*. Oxford University Press.
- Palmer, P. J. (1993). *To Know As We Are Known: Education as a Spiritual journey* (1st ed., p. xxvi, 130 p.). [San Francisco]: HarperSanFrancisco.
- Palmer, P. J. (1998). *The Courage to Teach: Exploring the Inner Landscape of a Teacher's Life* (p. 199). Jossey-Bass.
- Palmer, P. J., & Zajonc, A. (2010). *The Heart of Higher Education: A Call to Renewal* (p. 237). John Wiley and Sons.
- Pert, Candace. (1999). *Molecules Of Emotion: The Science Behind Mind-Body Medicine*. Simon and Schuster.
- Scharmer, C. Otto. (2009). *Theory U: Leading from the Future as It Emerges* (p. 533). Berrett-Koehler Publishers.
- Scharmer, C.O. (2009). Theory U: Learning from the Future as it Emerges - Excerpt. Berrett-Koehler Publishers.
- Siegel, D. J. (n.d.). *Mindsight: The New Science of Personal Transformation* (1st ed., p. 2010). New York: Bantam Books.
- Sipos, Y., Battisti, B., & Grimm, K. (2008). Achieving Transformative Sustainability Learning: Engaging Head, Hands and Heart. *International Journal of Sustainability in Higher Education, 9*(1), 68-86. Emerald Group Publishing Limited. doi:10.1108/14676370810842193
- Suzuki, S., & Dixon, T. (1970). *Zen Mind, Beginner's Mind* (1st., p. 134 p.). New York,: Walker/Weatherhill.
- Varela, F. J. (1999). *Ethical Know-How: Action, Wisdom, and Cognition. Writing science* (p. ix, 85). Stanford, Calif.: Stanford University Press.
- Swimme, B & Berry, T. (1994). *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era--A Celebration of the Unfolding of the Cosmos*. Harper.
- Varela, F. J., Thompson, E., & Rosch, E. (1991). *The Embodied Mind: Cognitive Science and Human Experience* (p. xx, 308). Cambridge, Mass.: MIT Press.
- Zajonc, A. (2008). *Meditation as Contemplative Inquiry: When Knowing Becomes Love* (Vol. 2008, p. 211). Lindisfarne Books.
- Zion, S., Kozleski, E., & Fulton, M. L. (2005). Understanding Culture. Retrieved from http://www.niusileadscape.org/docs/FINAL_PRODUCTS/LearningCarousel/Understanding_Culture.pdf