

**The Nature and Dynamics of Relationships
in Learning and Teaching**

by

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Raising test scores, scripted teaching, student conformity, and classroom control are some of the major emphases of schooling. While numbing and dumbing down our children, these emphases do not account for the importance of relationship for learning and teaching, not to mention for the general welfare and growth of our children. It seems as if we are in some sort of strange time warp where we have returned to the idea that learning is just pouring information into children's heads and where children are just manufactured in some sort of arbitrary assembly line. Devoid of passion the institution of schooling has little meaning or relevance. For both teachers and children, schooling is becoming just a process of going-through-the-motions resulting in mass mediocrity.

At the core of deep, meaningful, and relevant learning and of classrooms as communities lies the notion of relationship. In this chapter, I examine the notion of "relationship" as fundamental to everything we must do within the contexts of schools. The first section examines the notion of relationship as it applies to teachers, students, and subject matter. The next section discusses the relational dynamics of teaching and learning. The third section delves into the disconnects that are pervasive in schools and society, including the pervasiveness of double binds or "catch-22s." The final section examines how we can focus on relationships with and among children and on relationships as the conceptual focus of learning. This section also draws together the notion of relationships as the basis for classrooms as communities of knowledge producers.

Relationship

When we think of "relationship," we usually focus in on the connections between people. This focus, of course, is certainly one example of relationship. Even this immediate

focus is generally restricted to romantic and other close relationships. We do not think of the connections or disconnections between enemies, rivals, and the vast population of people on Earth as relationships. Although we may think of the connections we have with our pets as relationships, we generally do not consider the connection we have with the biological or physical world as “relationships.” And, we pay little attention to relationships between ideas as the primary focus of learning in any subject matter area.

However, the fundamental nature of our very existence is based on relationship. As Gregory Bateson suggests, “we live in a world of relationship... that’s all” (Bateson, N., 2010). Without relationship nothing exists. In the film, “An Ecology of Mind: A Daughter’s Portrait of Gregory Bateson,” Terry Deacon describes how hemoglobin is not a “thing,” per se, but rather hemoglobin is what it is in terms of its relationship to oxygen and the whole of any particular animal. The function of hemoglobin is defined by its relationships to oxygen and to the cells in the circulatory system (Bateson, N., 2010). Without such relationships, hemoglobin has no meaning at all. If we examine any object in our world, we quickly find that everything can be described in terms of its relationship to something else.

The essence of relationships is based on function, interactions, and/or meaning. In the hemoglobin example, the relationships are functional. Two crows playing as they fly around in the fall may not have an obvious “functional” relationship, but there most likely is a meaningful interaction that occurs between the two individuals. If we look at a Monet painting or listen to a piece of music, the relationship between parts of the painting or musical composition, along with the relationship to our own frameworks of meaning create additional meaningful relationships. In the latter example, we have layers of relationships, where the visual or musical compositions are comprised of relationships (between colors

and brush strokes or between notes and chords and tempo, etc.), which in turn interact with our own cognitive and emotional relationships.

As in the previous examples, relationships consist of cyclical feedback loops, where information or materials cycle through the components of the relationship. At one extreme, the cycles can be fairly simple as between the pedals and wheels of a bicycle. At the other extreme, the cyclical patterns in a self-organizing, complex system may involve many pathways. These pathways may vary depending upon the information being passed from one point to another. In the human body, low blood sugar (information about the system) can produce what we perceive as hunger, which we react to by eating. Even before the blood sugar levels change, our system adjusts to the intake of food. As we eat, our circulatory system changes some of the blood flow pathways so that more blood goes to the digestive system for absorption of nutrients. Other parts of our bodies receive less blood flow, which may result in getting sleepy. At the same time the mitochondria in our cells are converting the nutrients and oxygen into stored chemical energy. This brief example provides some sense of how complex systems involve large numbers of interactional functional relationships, even though many more cycles of activity occur. Complex systems are not necessarily “complicated,” but rather are systems that perpetuate themselves. The typical descriptors of such systems include: self-organizing, self-maintaining, self-transcending, self-regulating, self-generating. We live in world of complex systems, which include ourselves and all other living things, cultures and many other social systems, many earth systems, and the global ecological system (Capra, 1997).

In contemporary school settings, the content to be taught and learned tends to be rather thin in terms of relationship. Facts and concepts are taught with minimal, if any,

attention to the fact that everything can be understood in terms of their relationship to other “things.” In science, the emphasis is becoming more centralized with a focus on big ideas, but even the representation of these big ideas lacks the robustness of rich, transdisciplinary or integrated relationships. While some effort is made to create a degree of conceptual interconnection, science concepts are not presented *as relationships* and the interconnections that are provided are limited in terms of their transdisciplinarity and depth. Occasionally, concepts may be linked to another discipline, such as “energy” discussed in science and social studies, but such a view is fairly superficial. The complex sets of relationships involved in energy not only span physics, biology, ecology, and earth sciences, but also relate to sociology, politics, economics, mathematics, the visual and dramatic arts, literature, history, and so on. Furthermore, energy in the scientific context is always in relationship to some source and some “user,” recipient, or transformer of that energy. Then, of course, the meanings of “energy” can change across contexts. The meaning of energy in science is different from that of energy in describing social phenomena or artistic products or events. When we say, “my dog has lots of energy,” we are not describing the actual state of biochemical energy being transformed, stored, and utilized by the dog. Rather, we are describing a psychological state of excitement that involves its own sets of relationships, such as between the dog and me, the dog and her expectations (such as for walking, playing, or eating), my dog and other dog friends, and so forth. In order to understand “energy,” we need to understand this concept in relationship to its context, which is itself constructed of networks of relationships.

For human relationships, cyclical interconnections comprise the dynamics within and between individuals. Each individual is a bundle of relationships (Bateson, M. C., 2004b;

Fleener, 2002), where “who we are” is wrapped up in the complex knots of interconnections of all kinds, which intertwine over varying periods of time. Our relationships to “self, our beliefs, our cultures, our families, our everyday experiences, our social groups, and so forth, all intertwine to create dynamic, ever-changing “identities.” In a very real way, we are interconnected, complex, and adaptive systems. As in other complex systems, we maintain an organization pattern that we may think of as a personality and individual identity. At the same time, we undergo constant change and consist of nothing that is particularly solid in terms of personality or identity. Within this fluid sense of identity, we are all made of relationships – to our experiences, to others, to who we think we are, and so on. However, the tendency in current research on identity is to think of anyone’s identity as “solid” and unchanging, other than in a linear, developmental sense. Holding more than one identity or even considering that identity is slippery is not considered (Bateson, M. C., 2000; Bracher, 2006; Gallas, 1997; Wortham, 2006). Even though identity and the functioning of an individual can be described as intertwining complex systems, the insidiousness of positivism and mechanism seem to creep back into our assumptions about living beings and their identities. Undoubtedly, we do try to create a sense of solidity to our identities, but this appears to be much more of an illusory process, at least as described by Buddhist psychology (Chödrön, P., 2002; Guenther, 1974; Trungpa, 1991).

The fundamental points of paying attention to “relationship” involve the following.

- Examining relationships allows us to see how our world is richly interconnected, whether through a novel, a piece of artwork, a scientific inquiry, or a social analysis.

- Relationships allow us to see the functional interconnections between parts of a system, between systems, between people, and between larger social groups.
- Understanding relationships can help us work more effectively with complex systems, whether such systems are in the natural or technological world or in the social world of classrooms, schools, or society.

Teaching—Learning as Relationship

For the past several years, I have tried to place a greater amount of effort on seeing my students as sets or bundles of relationships and on trying to develop more meaningful relationships with them. I meet with each student individually near the beginning of each semester, while trying to see the unique interrelationship comprising each one. I also try to wake up each more thinking, “I’m going to be nice to my students... I’m going to try to connect with each one of them.” This “slogan” is a reminder not to see or treat them like objects or things to manipulate in some way.

I find it heart-warming that so many of my students open up and heart-wrenching that so many are contending with serious problems of all kinds. Some can hardly afford to eat. Some are homeless. Quite a few have serious health issues, including cancer, heart conditions, and MS. Some are working their way through university, have full time jobs, and are taking 19-21 credit hours. Some have been struggling with a history of familial abuse. I may never have known about these students’ relationships to self and others had I not taken the time to focus on developing relationships. I could go through entire semesters placing demands, deadlines, and all kinds of expectations on them without ever realizing the depth and extent of the issues with which they are contending.

Even before I started placing more explicit emphasis on relationships in my current academic career, when I was teaching children decades ago, I remember feeling that I needed to pay attention to each child's individuality and to their particular circumstances. I used to visit children and their parents in their homes and take extra time to just chat with them after school. In my first school, this seemed to be the norm, but, in the next three schools, I felt isolated in my efforts. Teachers and administrators did not seem to care about children. They were just objects to be controlled. In one elementary school, the principal demanded that the cafeteria be absolutely quiet during lunch! The quietest classes would get an award. At our first lunch after this edict, a couple children asked me in a whisper if they had to keep quiet. I asked them if they wanted the award. They said, "no." So, they talked. This example is not atypical. Schools continue to use behaviorist rewards and punishments to demean and control children. This event is a perfect example, as suggested by Terry Deacon, of using relationships to destroy other relationships (Bateson, N., 2010). In this example, the principal—student relationships, where the principal should be a model of compassion and decency, is used to negatively affect children's relationships with themselves and one another.

In this last example, the value placed on relationships occurred during the time when the children asked me about being quiet and when I responded with a question that gave them control and responsibility. That question also showed them respect and allowed the children to make their own decisions. As we work with children to help them re-take control over their lives in school, we need to place heavy emphasis on the development of relationships, especially during the first few months of school. And, we can never let the emphasis lapse. A remarkable teacher, Karen Gallas (1994, 1995, 1997), did just that every

year she taught. Her students ran regular classroom community meetings and participated in free-form talks (e.g., “science talks”). They cared about one another, helped and encouraged others, and supported those children who were having “bad” days or dealing with other issues. The classroom community emphasized not only interpersonal relationships, but also relationships across diverse ideas that were relevant and meaningful to the children.

Disconnects Among Teachers, Students, and Learning

The whole of schooling has the unsavory tendency to operate on unquestioned assumptions that undermine relationships of all kinds and at all scales. Many of our assumptions about teaching, learning, and schooling are situated in somewhat antiquated philosophical frameworks of positivism, mechanism, and reductionism that have permeated most of the developed and developing world. Positivism is a philosophical framework that suggests there is one external objective truth and that this truth can be understood through empirical research. René Descartes and Isaac Newton popularized this framework along with the ideas of mechanism (that the biological and social worlds can be understood as machines) and reductionism (that understanding the parts of a system allows one to understand the whole). With the growth of the complexity sciences we are beginning to see the limitations and problems of these three frameworks for understanding. We now see that there are multiple truths depending on the particular social or cultural context. In fact, we are subjective being where objectivity is just wishful thinking (Bateson, G., 1970/2000; 1979/2002; 1991). Where predictability was considered a highlight of positivism, the lack of predictability is characteristic of the complexity sciences. We also

have found that the earth and ecological systems and all parts of the biological world are better described as complex, self-organizing systems (or autopoietic systems) rather than as machines. And, we now see that the whole is actually much greater than the sum of its parts, even though understanding the parts is necessary (Capra, 1996; Davis & Sumara, 2006; Prigogine & Stengers, 1984).

These three major frameworks (i.e., positivism, mechanism, and reductionism) have been affecting the way we view teaching, learning, and schooling for almost four centuries, even though we are advancing our understandings of teaching, learning, and schooling as complex, non-linear, and highly subjective. Behaviorism, which can be seen as a subset of positivism, still reigns in schools. We use rewards, punishments, and gold stars (Kohn, 1993, 2001). We think that classroom management is the foundation of every classroom. We use multiple-choice tests as if they actually “measure” something objective. We continue to teach to rote memory through drill and practice. Schools continue to operate like factories and even prisons in some locations. Although many teachers are exceptions, children are generally viewed and treated as something less than human, especially as we move up the scale from teacher to principal to superintendent to state departments to state and national politicians.

Some approaches to “classroom management” may be useful in certain circumstances. However, the very idea of “management” focuses on the control of children. Implicit in this idea is a fundamental conflict of teachers against students. Teachers must control student behavior, and students need to conform to some arbitrary standard and obey teachers (Block, 1997; Wood, 1997). The attitudes propagated towards children by “management” serve to undermine efforts to promote independence, responsibility, democratic

citizenship, positive self-esteem, and the very foundation of community. Relationships from a management point of view are lopsided. In fact, they are based on hierarchy, where the power and control are at the top with the teacher. Relationships in hierarchies tend to be described as dominant—submissive or competitive, where others vie for control or vie for possibilities of working their way up through the hierarchy. In such contexts, students may compete with one another or may compete for control with the teacher (Lemke, 1990).

Others may submit to the power of the teacher and play the school game of trying to please the teacher. Gregory Bateson (1970/2000) described both of these types of relationships as fundamentally pathological and difficult to maintain. He used the terms complementary (e.g., dominant—submissive) and symmetrical (e.g., competitive) to describe the dynamics of certain types of relationships. The only type he considered to be healthy was what he called “reciprocal.” In reciprocal relationships, the involved parties engage in recursive processes or continuous cycles of negotiation, feedback, change, give and take, and mutual appreciation (Bateson, M. C., 2004b).

One of the basic underlying assumptions of schooling and teaching at any level is that of “us and them” -- a fundamental duality, which serves to separate people from one another. Such separation feeds into the establishment and reinforcement of a sense of individuality and psychological territoriality (i.e., ego). Both students and teachers develop this sense of separation as they continue to refine the “schooling” game. Communication becomes muddled as both parties vie for control (see Lemke, 1990, 1995) or vie for acceptance.

It appears that such a dualistic view provides the basic motivation for the development of hierarchical structures in human institutions, as well as social and political organizations and systems. Control moves downward through the hierarchy, and provides

the fundamental framework for the struggle for power. As Bertrand Russell (1938/1969) eloquently describes, the striving for power appears to be one of the fundamental motivations. Although people will defer to those with power in certain circumstances, where fear leads to a sense of loss of control, the desire for power and control manifests in other situations. For instance, we may defer to doctors to take control when we are ill. We defer to politicians to take control when we feel threatened (e.g., after September 11, 2001) or feel “out-of-our-league” or lacking in ability to make certain decisions. As teachers, we take and maintain control to various degrees and in different ways, if and when we feel insecure or threatened. Rather than give up control to students, which can be threatening, we defer to the familiar strategies that maintain the hierarchy.

The focus on standards and teaching-to-the-test promotes hierarchy and ignores the place of children in school and society, while promoting various political agendas and political capital and dismantling public education at the same time (Johnson, 2004). The individuality, social development, curiosity, and passions of children are not important from the perspective of the politics of schooling. In fact, there is some political benefit to keeping children from learning deeply, from learning how to function in democratic communities, and from following their curiosity. Deep, active learners and democratic participants are difficult to manipulate and control (Gatto, 1991; 2002).

We also view knowledge as a "thing" that is separate from one's being, identity, or experience. The process of knowing happens in the head, and there is no connection with heart or body. These are remnants from Descartes known as Cartesian duality or separation of mind and body. Gregory Bateson and others involved in cybernetics claimed that the process of knowing and the knowledge it produces are integral parts of all living

things. Each individual constructs understandings and meanings based on his or her own interactions or relationships with the world. We learn with our brains and all parts of our bodies, as well as socially with a kind of shared social or cultural mind. Information, the “stuff” of learning, moves through recursive pathways with each one looping back while adding further information and meaning (Bateson, G., 1979/2004; Bateson, M.C., 1994, 2004; Greeno, 2006).

Our obsession with testing hinders learning at deeper levels of understanding. There is no time to provide deep, meaningful, relevant, and stimulating learning opportunities. The intricate interrelationships that span various subject matter areas are explored, the depth of meaning and relevance of subjects linked to individual perspectives and interests, and the excitement that comes with insight are not valued in a system of tests scores that measure nothing or at least measure nothing of consequence about learning (Kohn, 2000).

Another effect of the assumptions embedded in positivism, mechanism, and reductionism is on how we view the teaching—learning dynamic. We present knowledge to children as a static body of information that is absolutely true. We act as knowledge authorities who focus on imparting this information to students. Even the knowledge we present, which also is depicted in national and state standards, is based on learning relatively disconnected parts, while thinking this is the only way to understand larger objects or systems. We extract and disconnect knowledge as fragments with minimal connection to broader contexts. The system of schooling in the United States is trying not only to mandate “core” knowledge that all children should learn, but also to move away from the ideals of child-centered teaching, learning, and curriculum. Teachers are asked to sign allegiances to various corporate curriculums, which were developed to focus on

specific content at the expense of what might actually be meaningful and relevant to children. At the same time, these corporate curriculums are often scripted. During implementation (i.e., teaching the curriculum), teachers are not allowed to vary the sequence, timing, and content. Principals visit teachers with stopwatches in hand in order to assure that all teachers at that grade level are at exactly the same point. Teaching from such a perspective is viewed as a mechanical, linear, and technical enterprise. There is no room for addressing children's interests, curiosity, critical thinking, artistic expression, personal and social growth, or deeply interconnected, meaningful, and relevant learning.

Frequently such conflicting assumptions can place children and teachers in double binds. *Double binds* are situations quite like dilemmas, with no apparent "good" choice. Gregory Bateson and others described such situations as creating "crazy" situations and even contributing to schizophrenia (Bateson, G., 1970/2000, 1991; Bateson, N., 2010). Some of the typical types of double binds we place on children include:

- asking children to take on more responsibility in the classroom, then we reprimand them when they assert more control;
- telling children we want them to learn something in depth, then give them superficial multiple choice tests;
- asking them to be critical thinkers, then dismiss their critical thinking;
- telling children that you want them to share in the control of the classroom "community," then repeatedly assert our control;
- asking children questions like, "why didn't you do your homework?" – this question immediately puts a child in the position of being wrong no matter how

she or he answers the question (negative questions tend to place people in double binds).

Teachers are caught in similar double binds, some of which are perceived to be threats to their livelihood and career. They are told to “teach to the test” and raise test scores. I even heard one superintendent tell his teachers that he wanted all students in the district to score above average, which is a mathematical impossibility. If teachers choose not to teach-to-the-test, they risk losing their jobs. If they choose to follow these orders, they may feel like they have not provided real and deep learning opportunities for their students.

Double binds also provide opportunities for seeing problems from different perspectives and reaching creative solutions that were not obvious from previous perspectives (Bateson, G. & Bateson, M. C., 1987/2005; Bateson, M. C., 2005; Bateson, N., 2010). However, as teachers we can attempt to avoid creating further double binds for our children. Many of the assumptions discussed earlier in this section work their way into our teaching lives and create double binds for children and teachers. The choice is to conform to the assumptions of schooling or fail in some way. Either choice seems to result in confusion and pain. However, the suggestion in this chapter is that we can begin to notice how our assumptions affect teaching, learning, and schooling. As we notice these assumptions and how they affect ourselves and our students, we can begin the process of not being controlled by them. As we proceed, we can re-create or re-compose our professional lives, our teaching, our relationships with children, and the way we create and maintain classroom communities. Using complex systems, including the notion of relationships, as a lens and framework for teaching and learning, can provide a “creative

leap” for resolving double binds and a way for creating cohesive, relevant, and meaningful approaches to learning, teaching, and schooling.

Relationships in Classroom Contexts

What happens when we do see things as sets of relationships or see them in relationship to other things? This question actually points to how most of us relate to each other and to the variety of contexts within which we live and work. When we see “things” as things, we label, categorize, and evaluate these things as separate from us and everything else. We can see these things as mere objects or resources to support our own desires. For instance, we can look at a tree as a “thing” in our backyard. We may label and categorize it and say that it is pretty and provides good shade or that it is ugly and would make good firewood. From either viewpoint, there is little acknowledgement of the intricacies of the relationships that make up the tree and that the tree has with other plants, animals, and us. In our own classrooms, we can look at students as mere objects. We follow our teaching agenda, evaluate them on what they have “learned,” then move on to the next group of students.

Many teachers spend considerable time and effort complaining about and criticizing students. They blame the students, their parents, or society for various problems they are confronting in the classroom (Miller, 2011). However, what happens if we actually look at each individual student as a complex set of relationships? Once we begin to see the interdependencies that comprise each individual, we see an inherent vulnerability, the same sort of vulnerability that we all share as humans. What we see is a shared sense of humanity. We may find that our irritations with a particular student are similar to those we

have with ourselves, our spouses, friends, and families. We also may see how society has contributed to the development of each individual. Their laziness or going-through-the-motions approaches to schooling may be disappointing, but are probably due to the student's relationships to schooling and society. Of course, blaming students, schools, or society and using them as excuses does not lead to healthy relationships. Laying blame tends to promote pathologies in relationships by avoiding responsibility, perpetuating negative patterns of relationship, and promoting negativity, in general.

Relationships in classrooms and elsewhere are in constant flux. Catherine Bateson (2004b) suggests that these processes of personal change are much more dramatic than during earlier periods of history. At the same time, our social groupings are strained by increasing diversity and a variety of polarizing ideologies and other factors. As a result, teachers are faced with incredible challenges. While diversity may present challenges, as in evolution, diversity is essential for growth and development. Working with groups of any kind, including highly diverse ones, involves an initial realization of the inherent interdependency of group members (Lave & Wenger, 1991) once a group is established. This interdependency is interwoven around communication, identity, purpose and nature of the group (or community), participation, and meaning (Calderwood, 2000; Lave & Wenger, 1991; Ruesch and Bateson, 1951/2008). All of these factors among others play an integral part of what recent research is referring to as "coordination dynamics" (Kelso & Engström, 2006). This research has been focusing on the relational dynamics in various and often oppositional pairings across contexts and scales from the nano to the cosmic. At the core of such relational dynamics is the tendency of all complex systems of relationships to be in a constant state of imbalance, while working towards but never achieving balance.

In living systems, to reach a state of balance is to die (Bateson, N., 2010; Capra, 1996; Kelso & Engström, 2006). The central factor, as discussed previously, focuses on the cycling of information. This information may be in the form of chemical changes, neuron transmissions, visual signs, talk, and so forth.

Classroom communities are ever-changing, dynamic, complex systems of relationship. Dysfunctional classrooms tend to try to control students, ignore the constant change of individuals and the group, promote conformity and stasis, and hinder information cycles in terms of classroom talk and relationships between children. The key components of communities, including the purposes and meanings, participation, and identity, are not addressed in ways that are consistent with an authentic community of practice (Lave & Wenger, 1991; Wenger, 1998). More authentic communities of practice may focus on students as writers, artists, young social inquirers, young scientists, social activists, or environmental activists communicating to audiences beyond the teacher and classroom.

In educational circles, we talk much about the establishment of classroom communities. Such an emphasis on communities even appears in the National Standards for Science Education (National Research Council, 1996), where the teaching of science should take place in communities of inquiry. However, establishing functional communities seems destined to failure. In fact, the more I ponder the notion of community, if such communities arise from hierarchical assumptions, the more I wonder whether hierarchies are at all functional, equitable, or humane in any human situation. In order for communities to avoid becoming dysfunctional, inequitable, and inhumane, they need to be based on different sets of assumptions, such as those involved in holarchic structures (see Volk, 1995; Bloom & Volk, 2007). As opposed to hierarchies, holarchies do not have a fixed path

for power and control. They are embedded layers that allow for multidirectional movement between layers and for power and control to be distributed. Such a sense of holarchy seems to underlie the notion of community as described by Lave and Wenger (1991), who examined a variety of culturally-based and highly functional apprenticeship models, and by Wenger (1998) in how to establish communities of practice. In such cases, the layers of holarchies involve the degree of participation in communities. Participants move between the layers, hopefully inward toward full participation -- where no one person is in control, but where control is distributed among the full participants. In another sense, layers may refer to layers or even types of control. However, participants move between the layers, taking on differing roles in the control of various functions of the community. In a holarchic view of communities, control and power flow among the layers and are not unidirectional. Communities based on holarchies bring the potentiality of creating situations, which are more humanely and equitably functional. In addition, the ownership of such communities is shared among the participants. The duality of "us and them" dissolves and leads to a sense of shared context, vision, and control. Each participant has a stake in the success of the community. As a result, the efforts in hierarchical situations to vie for power and control, play the game, or be accepted by those in control, are exchanged for efforts to sustain and promote the success of the community. The potential for the development and propagation of creativity, well-developed and contextually rich understandings, and meaningful products is a major aspect of the functionality of such communities.

In classroom communities, we cannot view the development of relationships as the creation of static structures. Assigned seating, assigned roles, mandates about behavior or talk, and other attempts at solidifying the situation are all problematic. From a systems

perspective, we need to promote each student's sense of ownership over the operation of the classroom community. The diversity of backgrounds, personalities, interests, and passions needs to be valued and incorporated into the function of the classroom. We also need to address how all of these factors work together within a constant state of change of parts (students and teacher) and whole.

Learning, Relationships, and Complex Systems

As a society, we seem to have fallen back into seeing learning as disembodied or as a purely semantic process of memorized, disconnected information that has no connection to our bodies or lives. On the other hand, when we view learning as a complex system, the entire process becomes intimately personal. Such learning is much more than standard academic information. It involves emotions, aesthetics, values, imagination, fantasy, the sharpening of a variety of cognitive skills, and developing relational connections across contexts and across scales (Bloom, 1990; Bloom & Volk, 2007). We may have experienced embodied knowing and learning as what we "feel" and do within some area of passion or expertise, such as bicycling, cooking, building a piece of furniture, fixing an appliance, knitting, meditating, swimming, etc. The typical "territory" of school learning tends not to become embodied, but rather superficially and temporarily situated in our heads.

Embodied and complex learning is more than a set of knowledge. It is an ongoing process of developing understandings, posing questions, pursuing one's curiosity and passions, adapting to changing situations of all kinds, and feeling our learning as a part of very being. Such learning is transformative – holding tremendous potentiality for changing who we are and how we view and interact with the world.

Learning can be viewed and developed as both a non-linear heavily interconnected process and as a social process of knowledge production (Marshall, 1992), where complex webs of interrelationships are the “content focus” of learning. Such learning needs to involve deep exploration and inquiry. The resulting understandings include seeing how multiple relationships connect particular objects, events, and situations in a variety of contexts. However, we need to be cautious in seeing learning as “resulting” in some understanding. Our understandings are not static. They change, develop, become less or more cohesive, fade or revive, and connect in various ways to our personal situations. Learning also involves the development of multiple possible explanations and explanatory models, as well as the posing of questions that may remain unanswered. Extending or transferring learning across disciplines and contexts involves exploring the relationships that span disciplinary and contextual boundaries (Anderson, et al., 2004; Bloom, 2006; Bloom & Volk, 2007, in press; Engstrøm, 2009). If we focus on a bicycle, students can explore and inquire into how a bicycle works, including the interrelationships between the wheels, gears, pedals, and handlebars. They can develop scientific explanations and models of these relatively simple mechanical systems. However, any particular bicycle is greater than the sum of its functional parts. For some, a bike is part of one’s identity (including the cyclist’s attire). For others, a bike is a recreational or athletic vehicle. Increasingly in the United States, bikes may also serve as semi-optional means of transportation. In some parts of the world, the bike may have little to do with identity or recreation, but instead is an essential means of transportation. The meaning associated with the bicycle is part of the idea of the whole being greater than the sum of its parts. The bike is a set of mechanic relationships. But, it also involves multiple sets of relationships to

the rider's emotions and identity, culture, social contexts, society, environmental concerns, health, and dogs that love to chase bikes.

Where to Go From Here

Unfortunately, there is no formula or procedure to follow to create and help maintain individual and community relationships. The diversity among students and teachers provides the “energy” to create a community. Any attempt to create a solidified approach misses the whole point of diverse, dynamic, complex systems that work towards adaptation to unique circumstances and towards, but never achieving, balance (Calderwood, 2000). The teacher has to be an authentic presence, vulnerable, yet unshakeable, and interested in the diversity and changeability of the classroom community.

Much of the previous discussion in this chapter focuses on assumptions that are deeply rooted in positivism, mechanism, and/or reductionism. The seeming security of thinking there is an objective truth, one right answer, and a neatly, predictable world are quite seductive. As a result, positivism, mechanism, and reductionism insidiously make their way into all parts of our lives, even if we profess to no longer place allegiance with these frameworks. As a continuing practice, we all may need to ask ourselves on a regular basis:

- “Are my actions in the classroom consistent with the assumptions of complex systems?”
- “Are conflicting assumptions undermining my attempts to work in different ways?”

A considerable amount of research has examined the “roles” of teachers. However, little of this research has contended with the concomitant roles of students, except in

fundamentally dysfunctional situations (Lemke, 1990). The study of one person's role is, as Gregory Bateson (Bateson, N., 2010) suggests, "half-assed." We cannot study one person's role without consider the role of others. They are inextricably intertwined. To look at only one side of the relationship misses the "relationship." At the same time, there are "roles" played by students and teachers that may be useful to consider as guiding metaphors for practice:

- teacher as orchestrator – students as musicians (interpreting and expressing emotional understandings)
- teacher as mentor – students as apprentices (moving towards being mentors themselves)
- teacher as instigators – students as co-instigators (working to make a difference socially or environmentally)
- teachers as choreographer – students as dancers (working with expression and spontaneity)

The power of these and other metaphors are in how they can frame our practices in ways that are consistent with a complex systems and relationships framework. They do not suggest actual steps, but they do suggest possibilities of how teacher and students manifest.

Additional Resources

Bateson, M. C. (1994). *Peripheral visions: Learning along the way*. New York: Harper.

Bateson, Nora. (2010) *An Ecology of Mind: A Daughter's Portrait of Gregory Bateson*. As of publication date, the film is available for institutional purchase from Bullfrog Films:

<http://www.bullfrogfilms.com/catalog/emind.html>.

Ecology, Mind, Systems – <http://ecomind.wikidot.com> – a website for students, teachers, and researchers that is devoted to exploring the issues of ecology, mind, and systems.

Gallas, K. (1997). *Sometimes I can be anything: Power, gender, and identity in a primary classroom*. New York: Teachers College Press.

Rogoff, B., Turkkanis, C. G., & Bartlett, L. (2001). *Learning together: Children and adults in a school community*. New York: Oxford University Press.

References

Anderson, J. R., Bothell, D., Byrne, M. D., Douglass, S., Lebiere, C., & Qin, Y. (2004). An Integrated Theory of the Mind. *Psychological Review*, 111(4), 1036–1060.

doi:10.1037/0033-295X.111.4.1036

Bateson, G. (R. E. Donaldson, Ed.). (1991). *Sacred unity: Further steps to an ecology of mind*. New York: A Cornelia & Micahel Bessie Book/Harper Collins.

Bateson, G. (1970/2000). *Steps to an ecology of mind*. Chicago: University of Chicago Press.

Bateson, G. (1979/2002). *Mind and nature. A necessary unity*. Cresskill, NJ: Hampton Press.

Bateson, G., & Bateson, M. C. (1987/2005). *Angels fear: Towards an epistemology of the sacred*. Cresskill, NJ: Hampton Press.

Bateson, M. C. (1994). *Peripheral visions: Learning along the way*. New York: Harper Paperbacks.

Bateson, M. C. (2000). *Full circles, Overlapping lives: Culture and generation in transition*.

New York: Random House.

Bateson, M. C. (2004a). A talk at the Bateson@100 Conference. Berkeley, CA.

Bateson, M. C. (2004b). *Willing to learn: Passages of personal discovery*. Hanover, NH:

Steerforth.

Bateson, M. C. (2005). The double bind: Pathology and creativity. *Cybernetics and Human*

Knowing, 12(1-2), 11-21.

Block, A. A. (1997). *I'm only bleeding: Education as the practice of social violence against*

children. New York: Peter Lang.

Bloom, J. W. (1990). Contexts of meaning: Young children's understanding of biological

phenomena. *International Journal of Science Education*, 12(5), 549-561.

Bloom, J. W. (2006). *Creating a Classroom Community of Young Scientists* (2nd ed.). New

York: Routledge.

Bloom, J. W. (2007). A theoretical model of learning for complexity: Depth, extent,

abstraction, and transfer of learning. *Presented at the annual meeting of the American*

Educational Research Association, Chicago., 1-20.

Bloom, J., & Volk, T. (2007). The use of metapatterns for research into complex systems of

teaching, learning, and schooling. Part II: Applications. *Complicity: An International*

Journal of Complexity and Education, 4(1), 45-68.

Bloom, J. W., & Volk, T. (in press). Metapatterns for research into complex systems of

learning. In N. M. Seel, (Ed.), *Encyclopedia of the Science of Learning*. Heidelberg,

Germany: Springer—Verlag.

- Bracher, M. (2006). *Radical Pedagogy: Identity, generativity, and social transformation*. New York: Palgrave MacMillan.
- Calderwood, P. E. (2000). *Learning community: Finding common ground in difference*. New York: Teachers College Press.
- Capra, F. (1996). *The web of life: A new scientific understanding of living systems*. New York: Anchor Books/Doubleday.
- Chödrön, P. (2002). *Comfortable with uncertainty: 108 teachings*. Boston: Shambhala.
- Davis, B., & Sumara, D. (2006). *Complexity and education: Inquiries into learning, teaching, and research*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Engstrøm, Y. (2009). Expansive learning: Toward an activity-theoretical reconceptualization. In K. Illeris (Ed.), *Contemporary theories of learning: Learning theorists... in their own words*. New York: Routledge.
- Fleener, M. J. (2002). *Curriculum Dynamics: Re-creating Heart*. New York: Peter Lang.
- Gallas, K. (1994). *The languages of learning: How children talk, write, dance, draw, and sing their understanding of the world*. New York: Teachers College Press.
- Gallas, K. (1995). *Talking their way into science: Hearing children's questions and theories, responding with curricula*. New York: Teachers College Press.
- Gallas, K. (1997). *Sometimes I can be anything: Power, gender, and identity in a primary classroom*. New York: Teachers College Press.
- Gatto, J. (1991). *Dumbing us down: The hidden curriculum of compulsory schooling*. New York: Society Publishers.

- Gatto, J. T. (2002). Some lessons from the underground history of American education. In R. Kick (Ed.), *Everything you know is wrong: The disinformation guide to secrets and lies* (pp. 274—287). New York: The Disinformation Company.
- Greeno, J. G. (2006). Learning in activity. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 79—96). New York: Cambridge University Press.
- Guenther, H. (1974). *Philosophy and psychology in the abhidharma*. Berkeley, CA: Shambhala.
- Johnson, E. B. (2004). *The dismantling of public education and how to stop it*. Lanham, MD: Scarecrow Education.
- Kelso, J. A. S., & Engstrom, D. A. (2006). *The complementary nature*. Cambridge, MA: MIT Press.
- Kohn, A. (1993). The case against gold stars, 1–3. *Parents*, October. Available at: <http://www.alfiekohn.org/parenting/tcags.htm>
- Kohn, A. (2000). *The case against standardized testing: Raising the scores, ruining the schools*. Portsmouth, NH: Heinemann.
- Kohn, A. (2001). Five reasons to stop saying “good job!” *Young Children*, September. Available at: <http://www.alfiekohn.org/parenting/gj.htm>
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York: Cambridge University Press.
- Lemke, J. L. (1990). *Talking science. Language, learning, and values*. Westport, CT: Ablex Publishing.
- Lemke, J. L. (1995). *Textual Politics: Discourse And Social Dynamics*. Bristol, PA: Taylor & Francis.

- Marshall, H. H. (1992). Seeing, redefining, and supporting student learning. In H. H. Marshall (Ed.), *Redefining student learning: Roots of educational change* (pp. 1—32). Norwood, NJ: Ablex.
- Miller, E. (2011). The blame game. *Encounter: Education for Meaning and Social Justice*, 24(4), 2–4.
- National Research Council. (1996). *National science education standards*. Washington, DC: National Academies Press.
- Prigogine, I., & Stengers, I. (1984). *Order out of chaos: Man's new dialogue with nature*. New York: Bantam New Age Books.
- Ruesch, J., & Bateson, G. (1951/2008). *Communication: The social matrix of psychiatry*. New Brunswick, NJ: Transaction Publications.
- Russell, B. (1938/1969). *Power: The role of man's will to power in the world's economic and political affairs*. New York: W. W. Norton & Company.
- Trungpa, C. (1991). *The heart of the Buddha*. Boston: Shambhala.
- Varela, F. J., Thompson, E. T., & Rosch, E. (1991). *The embodied mind: Cognitive science and human experience*. Cambridge, MA: MIT Press.
- Volk, T. (1995). *Metapatterns. Across space, time, and mind*. New York: Columbia University Press.
- Volk, T., & Bloom, J. (2007). The use of metapatterns for research into complex systems of teaching, learning, and schooling: Part I: Metapatterns in nature and culture. *Complicity: An International Journal of Complexity and Education*, 4(1), 25–43.
- Wenger, E. (1998). *Communities of practice: Learning, meanings, and identity*. New York: Cambridge University Press.

Wood, G. (1997). Teachers as curriculum workers. In J. T. Sears & J. D. Marshall (Eds.), *Teaching and thinking about curriculum: Critical inquiries* (pp. 97—109). New York: Teachers College Press.

Wortham, S. (2006). *Learning identity: The joint emergence of social identification and academic learning*. New York: Cambridge University Press.