



Emotional Learning: Getting Back to Basics

BY
Barbara Given

Does your district have a district-wide policy that honors emotional learning as basic to academic success? Have you thought about how school lunches and in-school snacks affect learning? How will you meet the needs of your students for positive touch? Do teachers in your school know what to do (and what not to do) when dealing with fearful youngsters? These are a few of the provocative questions raised by the author.



■ *Given is an associate professor at the Graduate School of Education Learning Disabilities Teacher Preparation Program and the Community College Doctoral Program at George Mason University, Fairfax, Va. She also co-directs the Center for Honoring Individual Learning Diversity, which is affiliated with the International Learning Styles Network.*

Emotional learning evolved long before cognitive learning, yet among educators the role of the emotions in learning has often been viewed as fluff or only the responsibility of parents. This is indeed sad since emotions drive attention, and attention drives learning, memory, problem solving, and almost everything else we do.¹ Emotions are now thought to be the link between body and brain and the energy that fuels academic achievement as well as personal health and success.²

Emotion, feelings, soul, and spirit are words and concepts shied away from by educators because the first two are considered the providence of counselors and the latter two are considered religious. These terms, however, speak to various aspects of emotional learning even though teacher preparation texts rarely present in-depth discussion on them unless the texts were specifically designed for teachers of emotionally troubled children. Even then, emotion as a precursor to learning is skimmed rather than explored in depth.

It is understandable, therefore, that educators may feel like tightrope walkers with neither balancing pole nor safety net when asked to define how they address emotions and emotional learning in their classrooms. Yet, leadership, motivation, persistence, and responsibility are as dependent upon

emotions as are lack of motivation, negative attitude, addictive behaviors, and gang membership. Thus, to determine what role school boards play in creating the appropriate emotional environment for learning, we need to 'get back to the basics' regarding emotional learning.

Emotional learning. This article was difficult to write. In addition to the sensitivity of the topic, the knowledge explosion makes many references out of date as soon as they are written. Nonetheless, Daniel Goleman, author of *Emotional Intelligence*, and Joseph LeDoux, author of *Emotional Brain*, among others, make clear the importance of emotions in brain development and achievement — two areas of vital concern to educators.³ Emerging knowledge reveals the acute need for educators and parents to understand the power of emotions over all types of learning — especially since emotional reactions were the earliest form of "learning" and they continue to regulate the brain, mind, and body for academic as well as physical survival. In fact, Antonio Damasio, head of neurology at the University of Iowa College of Medicine and author of *Descartes' Error*, stated that the emotional system connects directly to operations that generate the highest reaches of reasoning, decision making, and, by extension, social behavior and creativity.⁴ Thus,

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emotional learning served as an anatomical mentor for all learning systems that followed including visual, auditory, tactual, and kinesthetic-sensory learning.⁵

Over millions of years, emotion “programmed” specific fears in a small, almond-sized part of the brain called the amygdala (see the illustration on page 10). This tiny structure remembers emotional episodes of life even without willful intent and against all efforts to dislodge or replace them.⁶ Emotional learning can also be deliberate as when convincing yourself to be genuinely happy for a friend who got the job you wanted.

Biological basis of emotion. For a newborn, the most primitive need beyond nourishment for the body is nourishment for the soul, and this need lasts a lifetime — at home, in school, and within the community. Without acceptance and emotional support, the energy needed for developing new skills and learning to one’s highest potential is spent seeking affirmation, pursuing pleasure, and guarding against the physical pain of abuse, the mental pain of ridicule, sarcasm, and embarrassment, and the social pain of isolation, loneliness and rejection. In today’s world these dangers are ever bit as menacing as Bengal tigers were for the hunters and gatherers of yesteryear. At that time and even earlier, emotion evolved as a survival and procreation strategy from three primary systems: smell, taste, and touch.⁷ Even though rarely discussed as basic to education, these continue to influence emotion and behavior in ways not fully appreciated.

Smell. Chemical communication through smell evolved long before language as the earliest means of motivational and emotional functioning. Like the eye, the nose is an extension of the brain. Its receptors transport chemicals from the air to structures in the medial portion of the brain where they can alter brain-wave electrophysiological activity even when the subject is not aware that any particular scent is present. For example, researcher Alan Hirsch (as reported by Joseph⁸) conducted an experiment in a Las Vegas casino where he exposed some gamblers to a peppermint

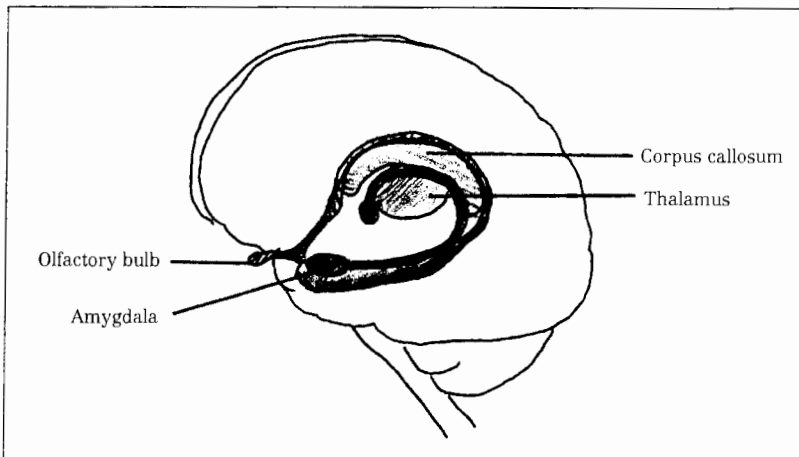
aroma. He found that those so exposed spent 33 to 53 percent more money and time gambling than did those not exposed to the aroma. Reportedly, peppermint fragrance also improved learning, creativity, and work efficiency in similar experiments with other populations.⁹

The evolving brain responded to airborne chemicals bombarding it by secreting chemicals of its own.¹⁰ Today, between 60 and 100 different brain chemicals or neurotransmitters diffuse throughout the body and brain to control thought and behavior, and, in humans, nerve fibers (axons) now lead from the olfactory mucosa of the nose and terminate in the olfactory bulbs where memories of up to 10,000 separate odors are stored.¹¹ As noted, many odors are too subtle to stimulate consciousness but strong enough to trigger an emotional, and sometimes unexpected, response.

For example, animals and insects across the species communicate via a chemical substance called pheromones. Humans, too, secrete pheromones through the skin — especially around the nose, genital region, and beside the teats in women to orient the baby for the mother’s milk. Pheromones are also found in urine, feces, and sweat, which helps explain why animals mark their territory by urinating along its perimeters. Some pheromones stimulate mating, while others inhibit it. Interestingly, men are reported to be less sensitive than women to olfactory perception due, presumably, to the woman’s evolutionary role in food preparation and family health; and, as the following scenario demonstrates, men might take advantage of this circumstance.

Let’s say a young man wears a musk cologne that smells similar to human testosterone. It only takes eight molecules — or 0.000000000000032 of an ounce — of animal musk from the anal sac of an animal to trigger nerve endings and set female hormones in motion.¹² Activated female pheromones, in turn, may send out “yes” messages of sexual availability, while the young woman forces herself to insist on “no.” Such mixed messages can unintentionally create a situation that can easily result in “date rape.”

Major Structures of Emotional Learning



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This double whammy — odor plus emotional reaction — can override all attempts at rationalization in the classroom as well. For example, a teacher’s subtle smells may resemble odors reminiscent of a sarcastic, disrespectful teacher from years earlier. Rationally, the child processes the teacher’s friendly tone, caring manner, and positive interactions, yet she may never like or trust the teacher because emotional memory warns, “Beware of someone who smells like that.”

Similarly, a whiff of perfume or cologne worn by a passerby reminiscent of a previous lover is apt to stimulate anger, tears, rapid heart beat or shallow breathing dependent upon previous emotion. Even without manufactured fragrances, each person’s odors are as individual as fingerprints, and they help define the individual. Infants — animal and human — first distinguish “mother” from others by how she smells, and autistic infants reportedly bite a nursing nipple and pull away due to a high sensitivity to maternal fragrances and natural scents.¹³ Not only do smells define, they last, and businesses take advantage of that fact.

The smell of money. Many corporate executives appreciate the link between smell and emotion as a way to boost sales and customer satisfaction. For example, visitors to Disney World are greeted by the aroma of freshly baked chocolate chip cookies, which quickens their step, moves them into

the park faster, and predisposes them for a joyous day.¹⁴ Toward closing time, the piped scent is turned off to encourage rapid exiting. Further, hotel owners found that when they included a slight rose scent in heating and air conditioning vents, customer ratings rose as did home sales when “cake-baking” aroma was sprayed around kitchens.¹⁵ Roughly 80 percent of the perfume industry’s revenues come from perfuming objects such as new cars, laundry soaps, clothing, magic markers, toys, and toilet tissue, while only 20 percent comes from perfumes to wear.¹⁶

To date, however, few studies other than the one pertaining to peppermint connect smell directly to learning. Indirectly, smell is thought to alter the emotional state and establish a mood conducive or harmful to enhanced input of new information and problem solving. Curious educators may find it profitable to experiment with different aromas in the classroom and analyze their impact on students’ emotional reactions and academic achievement. This may be a highly profitable adventure in centers that serve students with emotional difficulties or those at high risk for school failure or dropping out. Further, school systems that shy away from the hard facts about odors and sexual arousal, may find their teenage pregnancy rate on the increase.

Taste. Newborn babies can discriminate between sweet and sour during the first few hours of life outside the womb, and they use taste to learn about the world by repeatedly putting bits and pieces of it in their mouths.¹⁷ Since smell, taste, and touch share some of the brain’s emotional processing and memory structures, these shared centers allow humans to experience a partial sense of gratification and need fulfillment in one by provoking sensations in one of the others — an important fact for school personnel.¹⁸

To illustrate: Judith Wurtman, M.I.T. researcher and the author of several books on healthy eating, found that overeating and the consumption of unhealthy foods are triggered by emotional stress — anger, anxiety, depression, worry, frustration, loneli-

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ness, or emotional exhaustion. More important, she discovered that overeating and eating the “wrong” foods result from stress-produced brain chemistry rather than lack of willpower or self-discipline. She said:

“... [T]he force that drives us to put food in our mouths when we are stressed is biological. Denying it only causes it to grow stronger, delay further intensifies it, and stifling it ultimately propels it to break loose. The result can be an eating free-for-all — in other words, a binge.”¹⁹

What does eating have to do with social studies and history? A great deal. From a careful study of numerous volunteers living in a research facility, Wurtman and her associates found that carbohydrates, when eaten without other foods and in the correct amounts, trigger a sequence of biochemical events. The chain reaction goes something like this: When carbohydrates and insulin enter the bloodstream, carbohydrates convert to glucose and an amino acid called tryptophan; insulin pushes glucose and all other amino acids from the blood into muscle cells and leaves tryptophan behind where it circulates to the brain. Tryptophan is small enough to breach the blood-brain barrier so it enters the brain and triggers the production of serotonin; serotonin relieves stress, because it is positively associated with a sense of well-being, leadership, and self-esteem. Craving for carbohydrate-rich foods, therefore, is the brain’s search for something to satisfy the amygdala and other limbic structures whose emotional needs are unmet due to stress or lack of stimulation.

Replicated studies demonstrated that eating carbohydrates resulted in improved dispositions and the dissipation of unpleasant emotional states such as depression, anxiety, irritability, confusion, anger, feelings of fatigue and tenseness. For about three hours after eating carbohydrates, tryptophan continued to enter the brain, but gradually, insulin decreased its action, and tryptophan could no longer breach the brain-blood barrier and influence emotion. Serotonin synthesis slowed and a craving for something sweet — other than fruit — began anew — especially if stress remained.

Researchers found, however, that when eaten with protein, tryptophan competed with similarly shaped protein-produced amino acids for entry into the brain, thus reducing the carbohydrate effect.

Other than texts written by Rita and Kenneth Dunn²⁰ and their associates, the need to eat during class time is omitted from educational trade and text books, yet parents and teachers understand the power of food in achieving student compliance. “After we visit the dentist,” mother promises, “we’ll have a pizza before you go back to school.” “When you finish your work, help yourself to a bag of popcorn,” says the teacher to encourage student attention to drill and practice routines.

Dunn and Dunn advocate for the availability of vegetables or other healthy foods in the classroom for students who think and work better when chewing on something. They found that global, right-brained thinkers and students with a tendency toward underachievement prefer food intake while working on new and difficult material.²¹

Unfortunately, raw or slightly cooked vegetables may satisfy students who eat out of boredom or habit, but they do not satisfy students who eat to make themselves feel better when experiencing stress. Students in this group need carbohydrates such as crackers, toast, bread sticks, unsweetened dry cereals low in protein and high in carbohydrates, or unbuttered popcorn. If the body does not need intake, the Dunns found, students leave it alone once the novelty of having food in the classroom wears off. Andrew Roland and Pete Stone, elementary school principals, reported less classroom mess when food was permitted, because students learned to guard the privilege by monitoring spillage.²²

Perhaps it is time to design and implement research projects to investigate diet and its impact on learning — especially for underachieving students and those experiencing stress for whatever reason. Perhaps it is time for bold school divisions to take the composition of lunch menus and the availability of junk foods on school grounds seriously. In the absence of such bold

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measures, teachers could follow the lead of Rita and Kenneth Dunn and experiment with the availability of different food snacks — provided administrators approve of food availability in the classroom.

Touch. Two words are used interchangeably when speaking about the sense of touch: tactile and tactual. Strictly speaking, the first refers to the sense of being touched, feeling the wind blow against the skin, experiencing someone’s hand on your shoulder, and so forth. Tactual is the act of touching and manipulating — generally with the hands.

The skin is the largest sense organ of the body for soaking in emotional nourishment, and it is the one most in need of tactile stimulation immediately after birth. Researchers now know that tactile stimulation of the skin sends messages to the brain that stimulate the production of oxytocin and endorphins. Oxytocin promotes bonding between mother and infant, and endorphins — opiate-related peptides — produce a sense of well-being.²³ It is well-documented that babies in foundling homes die in infancy or grow up with severe difficulties relating to others if not handled and stroked — presumably because essential chemicals produced by being touched fail to materialize.

In a fascinating series of experiments conducted at the University of Wisconsin, researchers separated mother monkeys from their infants. Some were divided by a glass screen, others by a glass screen containing paw-sized holes so they could touch one another, and still others were housed in separate environments. No serious problems developed for monkeys who could touch their mothers through holes in the glass, but monkeys reared in isolation and those who could see, smell and hear their mothers but could not touch them suffered damage to the cerebellum.²⁴ Saul Schanberg, a Duke University experimental neurologist said touch is “ten times stronger than verbal or emotional contact, and it affects damn near everything we do. No other sense can arouse you like touch; we always knew that, but we never realized it had a biological basis.”²⁵

As babies mature, oxytocin levels decrease and endorphins and other peptides increase to sustain the sense of positive self-esteem, the sense of being nurtured, and a feeling of being loved. Children with high endorphin levels become self-assured, self-directed, and acknowledged as leaders at various ages.²⁶ Children whose needs for positive touch are not met at home or at school produce stress hormones such as cortisol that not only tighten muscles, but also reduce the brain’s ability to concentrate and learn.²⁷

Being touched is important for older persons, as well. Ackerman reported on an experiment whereby a Princeton University librarian gently brushed the hands of predetermined students as they checked out books. Upon leaving the library, students were asked several questions about their satisfaction with the library and its staff. Those whose hands had been touched reported significantly higher levels of satisfaction with the librarian and life in general than those not touched. As subtle as this small gesture was, it clearly demonstrated the impact of touch on adults.²⁸

In today’s society, where fear of inappropriate touch of children by adults is at an all-time high, school personnel — especially those working with adolescents — deliberately refrain from touching a student’s hand, shoulder, or arm out of concern that the touch may be misinterpreted.

Further, if students have a history of physical or sexual abuse or if they suffered from touch deprivation during the early years, they may be exceedingly fearful of any type of teacher touch. Children and adults are stripped, therefore, of opportunities to produce brain chemicals that bond individuals and produce a sense of well-being in the classroom. Consequently, families must provide touch stimulation not only for preschoolers and elementary students, but for adolescents and each other as well. Unless they do, the brain’s predisposition for being touched will go unsatisfied, and the subsequent production of harmful stress chemicals can result in limited learning and even brain damage.

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The art of self-touch. It is reasonable to add appropriate self-touch exercises to the curriculum. Before you gasp in total disbelief, try the following:

1. Put your fingers of both hands on the back of your neck and apply pressure. Move your fingers up and down the upper spinal cord and brain stem especially where the skull and spinal cord meet.
2. Move the hands down and massage the muscles along the collarbone (clavicle).
3. Apply pressure on especially tender areas for a few seconds, and quickly release it. Pressure points store tension that can dissipate with this simple technique.
4. Beginning at the top, unroll your ears and gently tug at the lobes, and massage along the inside curves of the outer ear where many acupuncture points are located.²⁹
5. Massage behind the ears and along the sides of the neck.
6. Wrap your arms around yourself tightly but comfortably until your fingers almost meet in back. Massage those areas under your finger tips along the shoulder blade (scapula).
7. Fold your arms, and stroke and massage the biceps.
8. Rub your hands together like two sand paper blocks to build heat.
9. Wring your hands as if by washing them without soap or water. Interweave the fingers and move the hands back and forth to massage the fingers.
10. One at a time, twist and pull on your fingers as if taffy were difficult to get off.
11. Place the middle finger of each hand on the forehead above the eye brow and apply slight pressure. Hold it for 30-60 seconds and release.³⁰
12. Place the middle finger on the temples and the thumbs in front of the ear lobe on the temporal mandibular joint. Apply slight pressure at the temples and massage the joints with the thumbs. About 20 percent of all messages to and from

the brain are affected by the temporal-mandibular joint, which tightens under stress, gets damaged with tooth grinding at night, and can cause severe headaches and mimic other illnesses.³¹

You get the idea. These techniques not only feel good, they relieve tension by relaxing the muscles. Also, self-touch can send positive signals to the brain, and thereby produce chemicals conducive to enhanced self-esteem, higher levels of concentration, and increased academic achievement. Further, they can help condition fearful youngsters to accept appropriate touch from others — an essential behavior for healthy adulthood.

School stress and fear. LeDoux, an expert on the effects of fear, found that when humans and animals sense danger from what they smell, taste, touch, see, hear, feel or otherwise experience, they react in one of three basic ways: immobility, aggression, or submission.³² Applied to school settings, students who feel fear of failure, ridicule, embarrassment, sarcasm, or rejection by adults or peers may sit passively as if wishing to go unnoticed — the equivalent of “freezing” or immobility in more acute cases of danger. This response triggers shallow breathing, which limits oxygen to the brain. Without an ample oxygen supply, the hippocampus and amygdala store fewer memories than with deep breathing. As an aside: LeDoux reported that little or no detailed memories were stored in cases of oxygen deprivation as in sexually assaulted or abused children who held their breath as a defense mechanism from acute fear or when their oxygen supply was drastically reduced by the weight of an adult’s body pressing against them or a hand was held over the mouth.

In contrast to the freezing response to fear, students may react by taking a stance similar to a gorilla or rooster whose territory is challenged — the chest swells, muscles contract, leg tendons tighten, and the entire posture is ready to fight to the psychological, if not the physical, finish. Of course, as the “lesson” continues, little or no learning takes place because

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memory chemicals are less powerful than stress chemicals activated for survival.

This type of student posturing may be totally misinterpreted by teachers who view it as insolence or cockiness and in need of a strong-handed approach that elicits compliance. To avoid punishment, some students whose aggression is a response to chronic stress or fear, may remain in their seats all puffed up ready to explode, but they wait until exiting the classroom to release their negative energies either verbally or physically on someone else — generally someone more vulnerable than they.

At this point, these students are beyond the reflective “fight-or-flight” pattern and have moved to a more pervasive strategy for dealing with discomfort. Often, that something is harmful to the individual, to others, or to society, but with each episode it becomes more “hard-wired” as insulating myelin on neurons thickens and it becomes a consistent behavior pattern.

Most students who are suffering from school stress and fear respond with a compliant or submission mode — they let it happen to them and respond as if everything were all right. Over the years, pretending may become just as habitual as the stress pattern discussed above. Such a stance, while easier on adults, reduces student motivation, suppresses self-determination, decreases a sense of positive self-esteem, subjugates individuality to the desire of others, and creates dependency rather than independence. Students in this response posture go through the motions of learning and probably make good grades, but their spirit, enthusiasm, and eagerness to explore new ideas and topics are diminished. They fall into a “Give me what you want me to learn and I’ll learn it” pattern of behavior. Their creativity, imagination, problem-solving and decision making are stifled as they do what they are told. They are rarely viewed as leaders and wonder why since they have done all they were asked to do and perhaps even more, and they wore a pleasant demeanor while doing it. Their unacknowledged leadership potential isn’t surprising, since different parts of the brain generate spontaneous smiles and laughter

versus purposefully created facial expressions.³³ Presumably, different neurotransmitters are also involved in authentic joy as compared to feigned pleasure. Certainly, incongruence between verbal and nonverbal communication in the compliant student is detected at some conscious or nonconscious level by children as well as adults.

Barbara Coloroso, author of the highly successful *Kids Are Worth It* program, said that submissive or compliant youngsters are a joy as children and often a nightmare as adolescents unless the fear of parental repercussions is greater than the fear of peer rejection.³⁴ As adolescents, they remain compliant, but now they are likely to comply with commands and decisions made by peers rather than adults.

Willful children, on the other hand, when given acceptable choices from preschool onward, learn to think and make acceptable decisions on their own. For example, when asked “Do you want to work the odd problems or the even ones?” a willful child may choose the first five odd problems and the second even five. That was not a choice option only because the adult failed to think of it; therefore, it’s best to accept it as a creative solution rather than to engage in a power struggle that no one can win.

Further, the willful child will always fight for self-determination, and Coloroso reminds us that’s not bad so long as the child’s choice is neither life-threatening nor morally threatening and the child follows through with the choice. Given ample opportunities for decision making throughout life, the willful child will become an adolescent and adult who can resist peer pressures and decide for himself or herself how to behave. By contrast, the willful child who learns to fight for the right to make decisions may become an overpowering bully.

As a university professor for 25 years, I find several graduate students each semester who operate in a compliant/submissive pattern. They are more concerned about their grades than learning; they find the generation of self-determined, self-organized, self-evaluated projects beyond their ability to cope, and they are frightened to investigate a topic of their own choice but

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will willingly write a term paper if given clear parameters for the paper’s final form such as the number of pages and references expected.

When asked to reflect on their course goals, how they organized their work to reach their self-determined goals, what worked for them and what did not, these students write about me and what they liked about my teaching. Clearly, their desire to gain approval by pleasing someone else continues to rule their academic lives in spite of overt experiences designed to promote their own decision making. While some of these behaviors could reflect an analytic learning style, they are of concern nonetheless since these teachers are expected to engender self-confidence and self-esteem in others, and they have not yet been able to manage these for themselves.

What’s a school to do? Emotional learning involves far more than the basics discussed in this article, but smell, taste, touch, and reactions to fear as the roots to emotional learning offer a good beginning. If educators and parents attend to the explicit and implicit information here, the rest can fall into place. Unlike spelling, algebra, and history, emotional learning is caught rather than taught. It occurs all the time — even in our dreams — as the brain responds to external and internal stimuli. Healthy emotions associate with a respectful, loving, nurturing philosophy of life that is lived and modeled by caring adults in the child’s home, school, and community environments. By contrast, unhealthy emotions emanate from association with people and environments that create stress and fear — including violent and sexually explicit programs on television.³⁵

Indeed, emotional learning pertains to a philosophy that honors individual differences, treats children with respect, encourages social bonding through authentic group projects, promotes leadership for all students, and expresses affection for students in professionally appropriate ways.

Barbara Coloroso’s *Kids Are Worth It* and Alfie Kohn’s *Beyond Discipline: From Compliance to Community* are two out-

standing philosophically based approaches to healthy emotional learning environments that also offer specific strategies for teachers.³⁶ Rita and Kenneth Dunn’s *Teaching Students through Their Individual Learning Styles* approach is more prescriptive and less explicit philosophically.³⁷ Nonetheless, its implementation honors individual learning differences in a respectful, problem-solving way that encourages students’ decision making about their own learning.

I mention these approaches because they address teaching for emotional learning as a pervasive, internalized way of life and not something to “stick in” or “add to” the curriculum. An emotional learning philosophy rooted in a knowledge of brain structure and functioning can incorporate many of today’s promising educational practices such as: thematic instruction with experiential or hands-on learning, emphasis on higher order thinking, reflective journal writing, collaborative learning, learning styles instruction, and many other approaches that allow the brain to strengthen and organize its neurons into healthy neural networks. Self-construction and organization are the brain’s work, and it flourishes with cognitive challenge and academic success so long as its emotional wiring is chemically free to “do its own thing,” free from preventable fear and stress and bathed in chemicals produced by respect and love.

Teacher preparation programs — at any rate, the ones I know about — tend to foster tradition in spite of efforts to do otherwise. This means school divisions continue to hire teachers who are ill-prepared for the emotional learning crisis faced by growing numbers of today’s children — and today’s teachers, I might add. The burden for fostering emotional learning within school environments — including bus, cafeteria, playground, gym, classroom, office, hallway, library, teachers’ lounge, and PTA environments — falls on school districts as it always has. This in no way lets teacher preparation programs off the hook. It simply states a fact — that school divisions have the final responsibility for what goes

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EMOTIONAL LEARNING...

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“Does your school division recognize that school environments can foster or interfere with healthy emotional learning by how it is modeled at all levels?”

on in their schools. And school boards make policy that affects everyone employed by the school district and the students it serves.

Does your district have a district-wide, living, breathing philosophy that honors emotional learning as basic to academic success? Is your district gaining a reputation for academic excellence but neglecting emotional learning? Does your school division recognize that school environments can foster or interfere with healthy emotional learning by how it is modeled at all levels? How does your school division support teachers, principals and other administrators who want to engender an authentic emotional learning philosophy in their respective schools? As your school board prepares for a new school year, is emotional learning on the agenda? @

Given's previous articles in the School News have been "How to Deal with Difficult Board Members: A Learning Styles Approach" and "Critical Learning Periods: What School Board Members Need to Know About the Brain."

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