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The Claremont Letter

Examining current issues in education highlighting the ongoing work of the faculty of the School of Educational Studies at Claremont Graduate University.

Emotional Mastery and Performance Knowledge: A Dialogue Between Education and the New Sciences

By Lourdes Arguelles, Alane Daugherty, and the New Sciences and Education Learning Community

It is well known among scholars and practitioners that stress and anxiety responses are genuine scientifically measurable reactions to a perceived stressor. It is also common knowledge that high levels of stress and anxiety have a multitude of negative psycho-physiological effects. These effects can contribute to the development of depression and other mental disorders. They can also severely inhibit cognitive functioning and thus academic performance.

A cursory review of the research literature on test anxiety defines this form of anxiety as one resulting in negative intellectual, emotional, and physical responses to the perception of being evaluated. Higher than normal levels of test anxiety are becoming commonplace in our schools and seem directly attributable to the prevailing culture of high stakes testing and standardized education, a culture that has compounded the multiple social, demographic, and pedagogical problems that have beset our schooling system for decades.

Our Endangered Adolescents

Though there has been an increase in mandatory annual testing in reading, mathematics, and science for every student in grades 3 through 8, the dependence on mandatory exit exams for high school graduation and the pedagogical practice of teaching to the test pose a particularly serious threat to the well being of our adolescent students. In a recent study that we conducted in collaboration with researchers from the Institute of HeartMath, and under the auspices of a U.S. Congressional Research Grant, we found that over 55% of 10th grade students in two large California high schools suffered from high test anxiety that was correlated with lower test scores. The words of a 17 year-old high school senior recovering from an attempt at committing suicide after failing his exit exam are illustrative of the experiences

School of Educational Studies at Claremont Graduate University

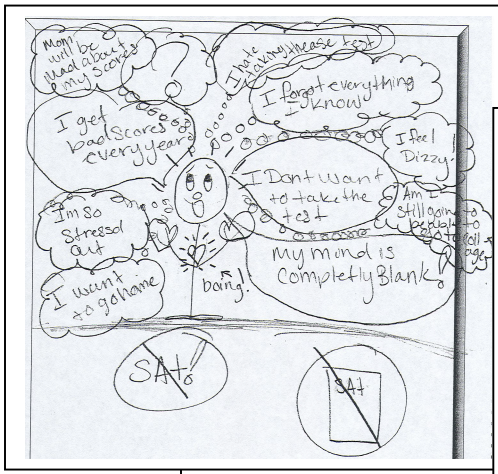
For more than 75 years, the School of Educational Studies (SES) at Claremont Graduate University (CGU) has been a leader in providing graduate education. Many of our more than 5,700 alumni have held positions as college presidents, superintendents, principals, award-winning teachers, and tenured professors at colleges and universities around the world.

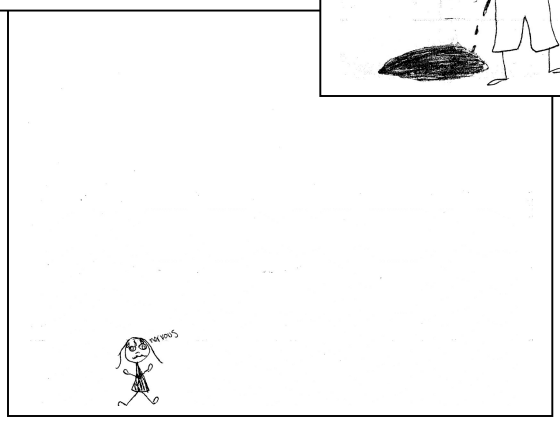
of these high school students:

"I knew that test would make all the difference in my life. For a year my teachers had been pounding this into my head. That is all they cared about, and I was already dealing with a lot of stuff at home, and I was not interested in much of it…it did not make any sense to me. I could not remember much of it. When I flunked I felt that my life was not worth it. It was like the end. I had failed everybody I cared for. I had no future. So I tried to kill myself. I truly wanted to die. I felt angry and like a nobody. It is a little better now."

Similar feelings were embedded in images drawn by a large number of more than 800 students from the same two high schools who responded to the prompt: "Draw how you feel when taking a high stakes test." Three samples are reproduced below.

Adolescence in an advanced information society such as ours is a time characterized by high levels of stress and anxiety. Unlike adolescents from older and less technologically intensive societies, our adolescents face a number of challenging physical, psychological and social demands and fragmenting forces without the strong supports of an integrative culture, legitimate life transition rituals, and communal supports. The incomplete stage of maturation of the adolescent brain adds another complicating factor to this situation. Research has shown that within the brain the amygdala is a primary structure involved in emotional processing, while the frontal lobe plays a key role in cognitive processing and perception. Magnetic resonance imaging (MRI) studies have shown that the adolescent brain has a more active amygdala and a less developed frontal lobe compared to the adult brain. Not surprisingly then, adolescents are particularly susceptible to high levels of anxiety. Their life is one of facing extremely challenging socio-cultural conditions without adequate supports and with brains that are not biologically capable of thinking and processing emotions in the same way as competent adults. Raising the levels of test anxiety through emphasizing





ENGAGEMENT

SOCIAL JUSTICE

ACCOUNTABILITY

"The faculty of the school of educational studies believes a socially just nation educates all its diverse citizenry through networks of effective and accountable organizations that interact responsibly with families and communities…"

-From our mission statement

standardized education purveying static, meaningless information to an adolescent can be the last drop that causes an already full anxiety cup to overflow.

In the last few years the struggle against the negative effects of high- stakes testing and standardized educational culture in our schools has brought about an intensification of the search for more humane and effective pedagogies and assessment methods. These struggles have contributed to the development of many alternative educational programs and some structural changes within mainstream schooling. Less common, but extremely important, have been the combined efforts of educators and scientists to translate directly into pedagogical approaches the valuable discoveries and insights of the neurosciences. There have also been the efforts of a handful of educators to train teachers to develop and facilitate the acquisition of dynamic or performance knowledge that is the basis of how people interact in the world and engage in life.

The New Sciences and Education

In our efforts to address the challenges that face adolescent students in our schools, and to refine our pedagogical practices with educators who work with these students, we have created a transdisciplinary learning community consisting of faculty, doctoral students, and independent researchers to synthetically explore funds of knowledge generated by scientific research that relate to the psycho-physiology of teaching and learning. Among these funds of knowledge two have been particularly relevant for our purposes. These are: (1) the research on positive emotion and emotional mastery pioneered by the Institute of HeartMath in Boulder Creek, California; and (2) a pedagogical model for the facilitation of performance knowledge derived from neuro-science research by Renate and Geoffrey Caine.)

The urgent need to address the increased stress and anxiety provoked by the current conditions in schools led us to the work of a group of researchers in the field of neuro-cardiology associated with the Institute of HeartMath (IHM) in Boulder Creek, California. In the last decade researchers at IHM have conducted numerous studies comparing physiological, cognitive, and emotional states experienced during states of stress and anxiety with those experienced in states of positive emotion and emotional mastery. In the process IHM has amassed considerable evidence that self-induced feeling states of appreciation and other positive emotions are effective in changing heart rate variability patterns, the strongest physiological predictor of longevity and health, and in reducing the levels of the stress hormone cortisol. We have been working with IHM researchers in high schools throughout the nation developing, implementing, and evaluating *TEST EDGE*, a computer-assisted set of tools and curriculum materials designed to enable students to replace negative physiological and emotional responses to stress and test anxiety with responses generated by positive emotions leading to emotional mastery. The implications of the very promising results of the use of these HeartMath tools and curricular materials in improving the emotional mastery of students are many and varied. On one level is the promise that these tools hold for reducing the negative responses of stress and test anxiety while increasing the potential positive impact of that reduction on the cognitive performance and emotional well being of adolescents and other students. Additionally, because the physiological and cognitive effects of stress and anxiety can be far-reaching, we believe that this and other effective approaches to the reduction of anxiety are likely to improve interpersonal relations and the damaged self-concepts of our troubled adolescents. Lastly, IHM researchers have found evidence that emotions change in a measurable fashion the electromagnetic fields emanating from a person's body and that this change can have a measurable effect on the fields of those who are close to the person in question. The implications of these findings for teaching and learning practices are immense, and we are currently in the process of exploring them.

The need to facilitate performance knowledge in our own pedagogical practices led us to another group of independent researchers headed by Renate and Geoffrey Caine. Like the Caines, we are not content with facilitating static knowledge or the kind of knowledge that is mostly grounded in a surface grasp of essential concepts and is frequently not available in unplanned situations. We believe that both the teachers we teach and the students that they in turn teach need assistance in facilitating the acquisition of knowledge that is dynamic, grounded in deep visceral feelings, and retrievable in both planned and unplanned situations. The neuroscientist Elkonen Goldberg calls this kind of knowledge, adaptive knowledge. In order to develop classroom-based methods to facilitate performance knowledge in school and teacher training settings, the Caines have been engaged for almost two decades in dialogues with leading neuroscience researchers around the world. The Caines have found that most of these researchers would probably agree with the following statements: (1) Emotions and thoughts are deeply intertwined, and every concept and idea is always shaped by how people feel. Thus, emotional environments are not neutral. They literally shape understanding; (2) Some of the most primitive drives that people have, such as fight or flight in times of emergency, interfere with optimal learning. In a highly stressed and anxious classroom, fight or flight responses are rampant, and ineffective learning is inevitable; and (3) Every brain emerges out of a unique set of genes and is shaped by unique experiences. While common programs are legitimate, standardized instruction for all is inefficient.

The Caines have translated these and other significant insights about learning from contemporary brain research into a detailed pedagogical model anchored on three fundamental interactive and non-sequential elements. These elements are the indispensable core of a guided experience approach to teaching and learning geared to the acquisition of performance knowledge. They are: (1) Relaxed alertness or a state of low threat and high challenge; (2) Orchestrated immersion based on on-going and understandable apprenticeships; and (3) The active processing of experience. The Caine model, which provides blends of chaos/order and competition/cooperation, has been found to be effective in lowering test anxiety and in increasing performance knowledge in various settings in which it has been tested including, most recently, a consortium of 70 schools in Southern Australia.

The translation of the insights of the new sciences into pedagogical practices is a relatively recent development in education. Paradoxically, in a larger historical context, some of these new pedagogies grounded in emotional mastery and holistic engagement with life achieved through the facilitation of states of relaxed awareness represent a rediscovery and modern reinterpretation of elements of the socialization strategies of wisdom traditions and of ancient and non-western cultures. Not surprisingly, many who are rooted in the more mystical practices of some of the major religions and spiritual traditions, as well as many teachers and students who trace their origins to non-modern cultures, resonate in special ways with these new approaches to teaching and learning.

In a recent conversation a colleague from another institution shared the opinion that schools and most of our teacher training institutions will not be willing to even explore these and other exciting lessons from the new sciences in the foreseeable future. The implication of our colleague's comment was that we were wasting our time by involving ourselves in dialogues with scientists and in trying to translate the insights from their research into pedagogical practices and programmatic initiatives. Though we concurred with our colleague in his assessment of the poor prospects for change in the mental models of those who currently control our schooling system, we continue to humbly work to further our explorations of new sciences-based pedagogy. We want to continue to assist teachers in reducing test anxiety and in facilitating and assessing performance knowledge and thus improving the everyday life and future of students. We want to continue to be inspired by the exciting dialogues occurring in the context of our learning community and look forward to developing newer insights into the nature of our inner and natural worlds. And when our spirits seem to falter, we will remember the memorable words of Peter Senge: *"We need to act in the service of what is emerging, so new institutions and new insights create new realities."*

Lourdes Arguelles is Professor of Education and Cultural Studies and a licensed Marriage, Child, and Family Therapist in the State of California. She works pro-bono with immigrant youth among other underserved populations. Alane Daugherty is an Instructor in Kinesiology and Health Sciences at Cal Poly Pomona and a doctoral student in the School of Educational Studies. In addition to Ms. Daugherty, members of the New Sciences and Education Learning Community have included doctoral students Teri Hollingsworth, Kim Hartlett- Edwards, Jeff Lagozzino, Emily Wolk, Andy Behr, Peter Chen, Sam Bauman, Martha Barcenas, Adonay Montes, Manuel Rodriguez, and Celestina Garcia as well as alumni: Drs. Laurie Schroeder, Nola Butler-Byrd, L. Jeanne Freyer, Evangelina Brignoni, and the late Susana Nakamoto-Gonzalez. The work of the Education and New Sciences Learning Community will be presented at the 2006 Lilly Conference on College and University Teaching and at the 2006 Annual Meeting of the American Educational Research Association.

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