

*The Natural Learning Research
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**NATURAL LEARNING:
THE BASIS FOR RAISING AND SUSTAINING HIGH STANDARDS OF REAL WORLD
PERFORMANCE**

EXECUTIVE SUMMARY

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Imagine for a moment that all correspondence was still sent by parcel post, cars could not go faster than 25 miles per hour, and computers were used for no more than writing text. How would we operate in this global economy and in this century?

If it is not possible to function with outdated tools and services when it comes to survival, how can we possibly continue to support an educational system that ignores new research on learning and continues to “educate” using outdated tools? It is not that talented educators have never tried to bring the 21st century into the classroom. What pulls them back is a collective, deeply entrenched almost universally endorsed belief in learning as confined to memorization and teaching as being no more than the transmission of information.

From cognitive psychology to neuroscience, a picture is now emerging of the immense natural and biologically based capacities for learning that are at the disposal of every child. They explain how and why it is possible to learn by making sense of experience, gain deep understanding, pick things up from the context, get a feel for things, engage in creative problem solving, master self-regulation and take charge of one’s own learning. Both educators and the larger public are in desperate need of the fruits of this research. It is the only way to comprehensively raise standards and achieve the goals that the nation has, for both privileged and unprivileged students, and at all grade levels.

When they graduate from high school, students should be adequately prepared for life, whether they go to college, enter the work force or start a business. They need to have academic knowledge and skills, know about the world, be able to make effective life decisions, be creative and capable of adapting to a changing world, be smart about new information, work well and effectively with others and, ideally, care about the greater good in some way. The National Center on Education and the Economy calls most of this “adaptive expertise.” If students are to do all of this, it is time for educators to master the new world of learning, and for society to support them in that endeavor.

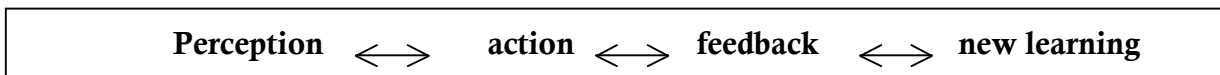
The Science of Natural Learning

No Child Left Behind calls for scientifically based education. For that to occur, however, the time has come to focus on a renewed view of how people learn. There is a natural biological and psychological process at the heart of developing adaptive expertise, and at the heart of ALL learning for successful real world outcomes. *The essence of natural learning is the engagement of perception and action.* All real world learning either changes the way that people come to see and

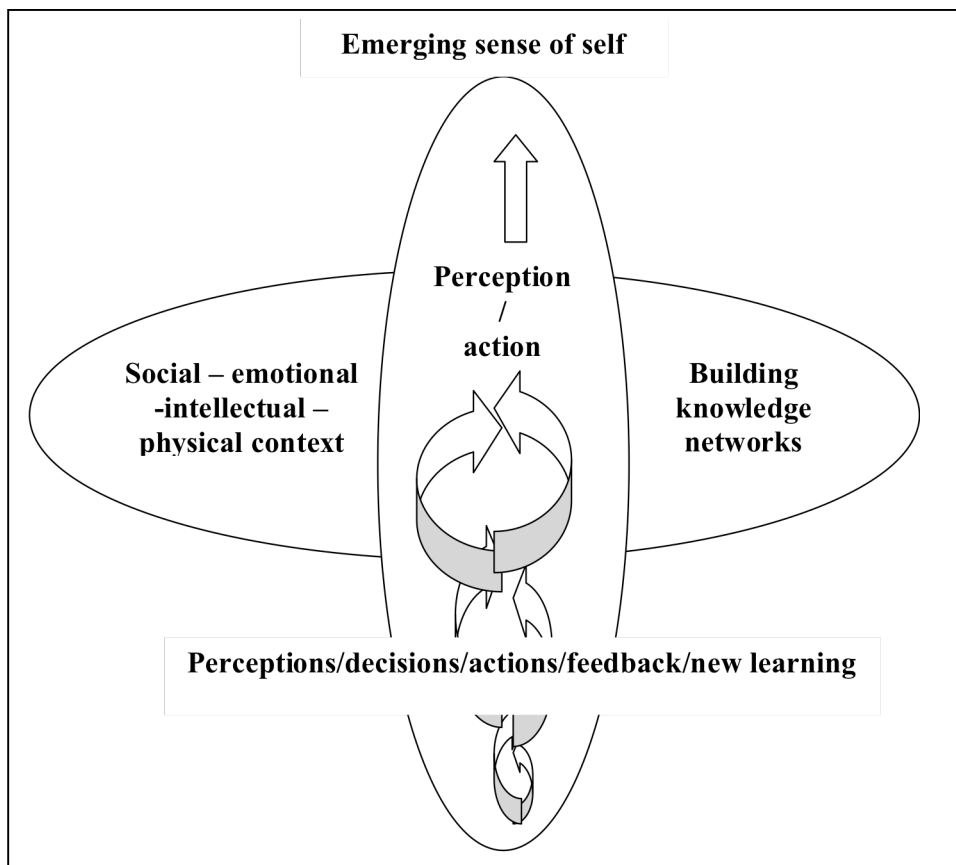
interpret things, situations and themselves, or changes the ways in which they act in the world or think about and plan action. Not surprisingly, biologists and scientists call this the perception/action cycle.

We call this the natural perception-action dynamic. It is a natural capacity with which all of us are endowed and by means of which all of us interact with our world.

Although the overall process is complex, in principle it is very simple. At its most basic, people observe, act and get feedback. The key is to learn from the feedback.



There is more, of course. Beyond the basic stimulus/response level, decision making (either conscious or unconscious) is involved. And the entire system is always engaged. All aspects of the process are infused with emotion. The perception/action dynamic engages the body as well as the mind, social relationships as well as individual effort, attention and purpose, the physical context as well as all the other capacities and potentials that a person brings into this life that can be called upon to support personal growth and development (see generally Caine and Caine, 2001; Caine et al. 2006). So it is more like this:



An infant learns through this natural process. It observes and focuses in on an object, reaches for it, gets feedback, learns. Adolescents interact with their video games similarly, as do all people when they play. They get involved, observe, make decisions, act on the basis of their current skills and knowledge, get feedback, reflect on what they need to change – and thereby improve. Moral and ethical values become internalized on the basis of action and feedback. The same process is at the heart of all creative work and the arts. It is the foundation for sports of all kinds and the essence of scientific research and essential to all innovations. People on the job learn this way. People with expertise in any field gain mastery by taking charge of their capacities for natural learning. This process is the biological foundation for making sense of things – what psychologists call the construction of meaning or constructivism.

The art of effective coaching, mentoring, guiding, parenting, supervising and more, all engage and capitalize on this natural perception/action dynamic. Unfortunately, this natural way of learning has largely been discarded at the classroom door. In most schools there is almost no opportunity to try things out, test perceptions in real world settings, make authentic decisions in any subject area from history to science, get in-the-moment feedback, experience real world consequences and adapt as a living human being to what is needed.

Outcomes

The brain is known for its ability to change as a result of experience and interaction with the environment. This is called neural plasticity (Greenough et. al., 1987). The adaptations and shifts that people experience, and the new knowledge that is generated, is structured in the brain as neural networks. Fuster (2003) uses the term “cognit” to describe a neural network that refers to a specific unit of knowledge.

Real world or performance knowledge essentially consists of cognits that are complex enough to allow a person to perform, change and adapt in, and respond to, ambiguous situations. Performance knowledge is always a combination of perception and action, infused with emotion, beliefs and social relationships in a physical context. A physical skill such as playing basketball or a rigorous scientific procedure is action based, but is also constantly being adjusted according to the

individual's perception and assessment of what is happening. It is only by means of experience in which direct instruction is embedded that all the different aspects of natural learning can work together. Through the natural perception/action dynamic students can develop as whole and integrated individuals who can both articulate disciplinary knowledge and apply it in the real world.

The Traditional System has Reached its Limits

The problem of low standards was acknowledged and an attempt made to address it through *No Child Left Behind*. On international comparisons in math and science such as TIMSS (2003), and on reading literacy such as PIRLS (2001), U.S. students exceeded international averages but lagged significantly behind the leading nations. And on domestic measures such as NAEP (2005), it was clear that there were also significant achievement gaps between white and black, white and Hispanic students, and wealthy and poor students.

However there is a deeper problem. The question is not simply one of whether students do well on tests, and whether scores can be raised, but how well they are prepared for life. That is much more difficult to measure, and yet there is a wide consensus that the system is failing by that criterion. That is the essential concern spelled out in *Tough Choices or Tough Times* (2007), the report of the NCEE's Commission on the Skills of the American Workforce. The problem is compounded by the fact that, in our opinion, most of the steps that are taken to improve test scores – even when they succeed - tend to interfere with preparation for life. Most of NCLB focuses on standardized tests. And one of the central consequences has been a focus on standardized, direct instruction. Sometimes, when the conditions are right, this can raise test scores until they plateau (see e.g. Fullan, Hill and Crevola, 2006) without addressing the underlying issues or achieving the goals of real world competence.

This messy yet tightly organized process has done a job, after a fashion. Most of the people who are currently successful in life have also been through the traditional education system. But as reported in *Tough Choices or Tough Times* (2007), and as leading commentators such as Michael Fullan and his colleagues have been demonstrating, the current system can not deliver on what is needed for the future. The essential weakness is an educational model built on memorization which is supported by an enormous infrastructure and related set of processes and procedures.

The entire approach is directed AWAY from student decision making and depth of understanding and does not invite genuine instructional change because it largely ignores or suppresses the inherent capacities for natural learning that are lying dormant in each and every learner. Teacher directed learning exclusively based on memorization allows for little or no possibility to demonstrate real world competence. Instead, the vast array of standardized tests are assumed to indicate that the student will succeed in the real world later on in life.

The point is that it is simply not possible to adequately teach for real world performance without adequately calling upon the real world in learning, teaching and assessment. That has worked to some extent in the past because the rate of change was slower and after-school experience filled the gap. Today's world is radically different. It is massively interconnected and is technologically and socially volatile. And today's students are different. They are growing up in a world where instant text messaging and an unrelenting flow of unsifted information are the norm.

Education has to address the nature of learners and the world in which they live. It can succeed when the latent natural capacities of learners are acknowledged and used. And, paradoxically, when that happens, scores on standardized tests also improve – and the improvements can be sustained. We have seen that in our own work with, for instance, a leading edge educational reform effort in South Australia called “Learning to Learn”.

The nation wants higher standards for all, but it can't get there based on the present, limited view of how people learn.

Natural Learning in Education

The role of real life experience in schooling has been a serious question for over a century. The question is not whether or not people learn from experience. They do because in most instances they have to: that is how life works.

Education based on natural learning is not the romantic process rightly dismissed by Hirsch (2005). It is much closer to the goal based scenarios developed by cognitive psychologist Roger Schank and his colleagues at the Institute for Learning at Northwestern University and used today by business at the highest levels. Or to the program developed by Dean Kamen through FIRST! which

partners students with engineers and others to use math and science to build robots that compete with each other in sporting competitions. In these settings students and adults are immersed in moderately realistic settings where they have to set goals, and then make the choices and engage in and reflect on the type of application of academic learning that leads to real world success.

The current thrust of education in the United States is to teach for basic skills (such as basic competency in reading) and for the memorization of a large number of facts. The essential next step would be to teach for intellectual understanding of concepts and patterns, as recommended in *Tough Choices Or Tough Times* (2007). Real world competence within areas of interest then tends to develop after college and through life experience in those areas – medicine, marketing, management and other types of work.

The essence of the challenge is to reverse the traditional order of doing things. The key is to focus on real world performance by fully engaging the perception/action dynamic beginning with a student's first days in education. Concepts, facts, procedures, authentic decision making, creativity and the enhancement of a student's inner life can and should be embedded throughout. The primary focus of assessment can then also be reversed with tests operating as supplementary aids.

The added benefit from the use of natural learning in academic subjects is that students develop their brain's executive functions (Goldberg, 2001) such as the capacities to set goals, plan and make effective decisions. They come to be able to examine and monitor their own thinking and reactions in different situations. And as they constantly develop these capacities through learning in this way, they also are exposed to opportunities to internalize moral and ethical values essential to becoming an effective adult.

Getting There from Here

The challenge is complex and difficult. The structure and organization of schools, training of teachers, management of time, approach to standards and assessment, use of text books and "teacher proof" materials and many other factors have to shift if genuinely higher standards based on natural learning and real world performance are to occur.

The question is how best to introduce it into schools. It is a shift that requires a new approach to teacher development. All the related concerns of discipline, attendance, motivation, safety and

diversity are addressed, but in different ways. We (Caine and Caine, 2005) and many others, have shown and are showing how it can be done.

There is no option. The current system cannot do an adequate job, particularly in such a rapidly changing technologically-based world.

The place to begin is with a renewed appreciation of the natural capacities that learners bring to their lives, and to reframe the goals and practices of education with those natural capacities in mind. ALL students, including students who are underachieving and deprived, benefit when more of their natural capacities to learn are called into play during their time in school.

The time has also come to take a larger and more generous look at the entire question of education and raising standards. We need to remind ourselves that we are all still learners, and that the worlds of government and business, spirit and science, conservatives and liberals all have a role to play. For above all, the standards we set for ourselves and our own willingness and capacity to work with each other and learn, are the real world standards that we actually set for our children.

The Natural Learning Research Institute

The NLRI was formed by educators with backgrounds in teaching, administration, research, neuroscience, biology, government and business for the purpose of making natural learning the cornerstone of education. It is committed to a collaborative and voluntary approach that makes learning, not testing, the primary focus for all facets of education. It seeks grants and raises funds in order to:

- Promote further research that integrates practice with these theoretical perspectives;
- Disseminate its findings as widely as possible;
- Network with individuals and organizations with similar goals;
- Conduct programs for the professional development of educators;
- Facilitate conversations about the future of education; and
- Work with communities to disseminate the more practical aspects of this work.

Its mission, then, is to promote the use of natural learning to raise and sustain high standards of real world performance across the board.

WHAT THE INSTITUTE DOES

We use the ideas and processes outlined in this paper to help educators and educational organizations better assess, integrate and focus their other work on professional development.

Our approach to school improvement

Our primary instruments are process learning circles. There are reflective action/study groups that build safe, challenging and deep communities of learning.

Our training programs

- We guide educators from a transmission model to a constructivist/natural learning model of teaching through a multi-phase program that combines training with on-site support.
- We offer advanced professional development - a variety of programs for the professional development of those who wish to become professional development consultants.

Public outreach

We welcome opportunities to share and about our findings work with and learn from others.

Our research

We research any program in which we engage with a school and or district in order to test its efficacy and further validate our ideas and procedures.

Examples of the Caines' work

- For a low SES elementary school that dramatically increased its test scores, and sustained those increases, see Hartmann, A.C. "District to try natural learning," *The Press-Enterprise, Riverside, California, Sunday, September 17, 2006*
- For the Caines' contribution as project colleagues to an eight year leading edge statewide program of educational reform go to <http://www.learningtolearn.sa.edu.au>

Many schools and educators are already exploring this approach to learning, some of which the Caines have worked with, although they may use different language. Examples include the *Collaborative for Teaching and Learning*, <http://www.ctlonline.org/>; the *Convergence Foundation*, <http://www.cef-trek.org/>; and the *George Lucas Educational Foundation*, <http://www.edutopia.org/>.

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