

SEEING EDUCATION FROM THE PERSPECTIVE OF NATURAL LEARNING¹

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*In all affairs it's a healthy thing now and then to hang a question mark
on the things you have long taken for granted. ~Bertrand Russell.*

This article is grounded in how and what people learn naturally from life. It suggests that the ongoing and ultimate outcome of learning should be steadily increasing capacities for real world competence. Real world competence includes and embraces subject matter mastery, the executive functions ranging from reasoning to decision making, self-awareness, social intelligence and more.

The article argues that all apparently competing approaches to instruction have a role. They need to be integrated appropriately. The article suggests an umbrella approach that the Caines call the **Guided Experience Approach to Instruction**. That approach (which a wide variety of genuinely high standard systems describe in their own language) should be implemented in all systems of education – including public, charter, on-line, business and home schools.

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1. TALKING PAST EACH OTHER

"When I use a word," Humpty Dumpty said in rather a scornful tone, "it means just what I choose it to mean -- neither more nor less."

"The question is," said Alice, "whether you can make words mean so many different things."

"The question is," said Humpty Dumpty, "which is to be master -- that's all." ~Through the Looking Glass, Chapter 6

Notwithstanding the disarray of education in the US, and the vast differences of opinion over everything ranging from how best to teach to what should be taught to who should control schools, almost all of us are driven to seek something that we can genuinely call world class education. Underneath the division there is a much more unifying call for something better and deeper and greater than what we have. It's for our kids. And for our world. And, of course, for us.

The core problem, we suggest, is that most of us who care about education, both within the profession and beyond, are talking past each other. We are not engaged in a coherent conversation and have immense difficulties in even listening to those with different perspectives. (As a caveat, the two of us are talking here about those who sincerely want to see significant improvements in education. We are not talking about those who, for instance, peer at education through the lenses of a possible revenue stream, a path for career enhancement, a weapon in an ideological war, a place to park kids while adults do something else, a convenient political platform, and so on).

An example of talking past each other

There is a difference between directly aiming for specified results and allowing them to emerge. Results are the byproduct of everything that is done. That is why simply comparing results on standardized test can be so misleading. Here is an example.

The formal system of education in the US and many other countries is largely driven by test scores, in the belief that high test scores represent high standards. For instance, the US often compares its scores on international tests (such as PISA or TIMMS) with countries that seem to do very well, such as South Korea and Finland, which ranked 2nd and 3rd on the PISA results in 2009 in reading and math.

(<http://www.oecd.org/pisa/pisaproducts/pisa2009keyfindings.htm>).

One problem. The countries with which we compare ourselves are different! Nations such as South Korea and Finland, (and regions and schools and families) can generate similar results on test scores by operating in very different ways. The scores on standardized tests represent the results of what the systems do, and the systems are doing different and often mutually exclusive things.

South Korea uses a fairly traditional instructional approach and a traditional way of managing education. The focus is largely on the teaching by direct instruction with some problem solving, intensive study and practice. There is also a secondary and somewhat shadow system of private tutors that is enormously pervasive. Both systems are supported and driven by the immense family and social pressure on students to study, intentionally aim for high test scores and “do well.” The pressure is so great that a 2011 survey reported that South Korean children are the least happy in the developed world (Survey, Yonhap News Agency, May 5, 2011) and a constant theme in media stories about education in South Korea has to do with these side effects. Thus a story on ABC news) had the title: “Korea's rigorous education system has delivered growth, but it is literally killing the country's youth.” (ABC News 10-22-2013).

Finland focuses on equity – its primary concern is care for the well-being of students and to provide them as much as possible, with a level playing field from the point of view of health and general welfare. In addition a somewhat more experiential approach to teaching is favored. All teachers are expected to

have at least a master's degree. The goal is more for educators to use problems, projects, and other processes to teach for real understanding more than for memorization. The overall atmosphere and culture is both rigorous and relaxed. Results on test scores have largely been a non-issue. (See for instance, Compton, 2013; Sahlberg, P, 2011). And so, when Finland did so well on PISA 2000 many people initially thought that the results were an error!

When similar results on tests can be generated in vastly different ways, it means that the same test scores don't actually reveal the same things. In our opinion test scores can be useful, but only in the context of the larger program and the types of system of which they are a part. The reason is that all the variables of a program – and a system - both direct and indirect, work together to generate outcomes. It has been shown repeatedly, for instance, that in the U.S. there is a high correlation between low test scores and poverty. Finland offers an excellent counter-example. So clearly if we miss key variables, we may simply end up shooting ourselves in the collective feet.

Beyond PISA and test scores

When the results of PISA 2012 were released and Finland's scores and ranking were seen to have dropped a little in science and reading (its 15-year-olds ranked 4th and 7th respectively), while their math ranking dropped to 15th – cite the study). Korea also dropped a couple of places in reading and math, and it dropped from 2nd to 11th in science (<http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf>).

The result has been some beatings of the breast within Finland about their decline in standards, as seen in an article on the Finnbay news website entitled *Golden Days Where Finland's Education Success Are Over* (Finnbay, Dec 3, 2013) and an article in the Economist entitled *Finn-ished*. (The Economist, December 5, 2013).

Of most interest to us is the shift in focus as the larger community in Finland seems to be becoming more fixated on test scores. We understand the angst.

The problem, from our perspective, is that if what we have read represents opinion in the country as a whole, the origins of the Finnish approach are being lost. Success should not just be framed in terms of test scores. But even for a system as well conceived and implemented as Finland's, it is so easy to succumb to the power of popular beliefs and ideas – such as the uniquely fundamental importance of test results – when those core ideas and constructs have been incompletely examined.

Let's assume that all of us have something to contribute

Although there is a common desire for something called “educational excellence,” people, schools and societies vary enormously in terms of the developmental process, in the ways in which they teach and their systems function, in what they aspire to, and how they will recognize it. From the perspective of the collective yearning and aspiration for something more, the two of us suggest that the best and most productive way to begin, particularly if we are to work together, pool resources, and resist demonizing those with whom we strongly disagree, is with the assumption that *almost every view of education is a little bit right*.

But just a little bit - irrespective of how impassioned and informed any one person or group of people might be.

The point is that “a little bit” is not the same as “completely and totally.” So *almost everyone is also a little bit wrong*. This report is partly about why this is so. It also seeks a new way to connect many of the little bits that are right (or seem right to us) into a bigger whole that both makes sense and is useful for those who are concerned about, or even desperate for, educational excellence that reveals itself both in performance and on test scores.

What, then, can possibly be “new,” given the vast educational edifice, so deeply entrenched and hugely funded, that is already in place. The core is to see that *“results” are the byproduct of the entirety of what happens*. Yes, teaching matters. And yes, parenting matters. And yes, poverty and equity

and the relative absence of stress matter. And yes, both the formal and the informal curriculum matter. And yes, institutional features matter. And so on. The challenge is to adequately blend and integrate what matters.

We suggest, therefore, that a common underlying framework is needed. It should be grounded in the best of what is known about how people learn naturally, take cognizance of and be appropriate for the massive changes in which we are all immersed, have a goal that addresses the majority of our common concerns, and provide a foundation for dealing with the tsunami of information and plethora of options enveloping us.

This does *not* mean that only experiential education “works” or that direct instruction is “bad” or that standards and tests should never be used. It means that everything that we do in schools is grounded in a set of ideas – an underlying theoretical framework - about how to get from here to there. So this is an attempt to generate some more clarity about where we are, where we actually want to go, and about what it really takes to get there.

2. THE BIFURCATED NATURE OF CHANGE

Things fall apart; the centre cannot hold; Mere anarchy is loosed upon the world. ~Yeats

One of the most overwhelming pressures with which education has to cope or for which students needs to be prepared, is the sheer volume of information and range of technologies in which we are immersed. Indeed, the amount of information being generated, consisting of facts, pseudo-facts, opinions of all shapes and sizes, radically different points of view, the blend and dance and marriage of entertainment and news and multi-mediated experiences, and the social networking that allows so much to go viral in so many different ways, is unfathomable.

We would expect competing and contradictory responses to the situation

from the many different places within it. However, there is also a broader way of viewing the situation as a whole. It has to do with system dynamics, and so that is a place to begin the search for ways to think ourselves through the turmoil in which we find ourselves.

In *Education on the Edge of Possibility* (Caine and Caine, 1997), we argued that the larger system of which formal education is a part is a complex adaptive system. It is not a mechanical system. It is volatile. Even then it was changing more rapidly than most of us could grasp. And it has become even more turbulent.

When a complex adaptive system becomes sufficiently turbulent, when the disequilibrium is sufficiently great, it reaches a bifurcation point. A splitting point. Then it naturally moves in several different and contradictory directions at once. In our 1997 book we introduced and anticipated three different tendencies that express themselves during bifurcation, each of which has accelerated since then.

- *There is a huge tendency to retreat back to the way things once were and to rediscover the certainties of the past.* There is an emphasis on order, on certainty and predictability, on things being manageable and measureable. From that perspective the most effective approach to teaching and learning is through the transmission of information, clarity of outcomes, and the management of logistics and context. The trend is so strong that we (Caine and Caine, 2011) called it the Transmission/Direct Instruction meme (TDI). We see this tendency being played out, for instance, in *No Child Left Behind*, in the fervent desire for high test scores, in the way that many are interpreting and implementing the Common Core Standards, and in the ways in which apps and tablets and technologies are being used in the service of the TDI.
- *There is the possibility of immense fragmentation, disintegration and*

disconnectedness. This disintegration and fragmentation of education can be seen in the wide range of options, both formal and informal, that have emerged and are emerging. These include the alternatives to traditional schooling including more charter schools, home schooling and unschooling, online schools and programs; the participation in and contribution to education from businesses and non-profits, including the flipped classroom, the proliferation of apps, and other sources of material; and the extraordinarily rapid growth of online modes of connecting and information transfer – ranging from gaming to social networking to underground communication; and more.

- *There is the almost invisible emergence of something altogether different that can function at higher levels and in radically new ways.* One of the properties of complex adaptive systems is that as they self-organize, new “higher order” properties and capacities emerge. This trend can be seen, we suggest, in the many educational experiments that blend lived experience with success in traditional modes of assessment (some of which are described later); in attempts to frame “standards” or curricula in terms of big ideas, systems thinking and what we call principles of connectedness; in the ways in which technologies are being implemented as useful tools in complex and sophisticated educational programs; and in the growing interest in mindfulness and consciousness generally.

It should be noted that these trends are perceived and interpreted in different ways. For the most part, however, each is expressing something of immense importance. It is important, therefore, to see that while they largely pull against each other it is possible for both the desire for the certainty of the past and the breaking up into new parts to be aspects of this larger whole that is trying to emerge.

Where to From Here?

What is needed, we suggest, is a coherent and common platform – a coherent

set of ideas and high level practices – upon which we can stand together as we seek ways of better navigating and shaping the emerging world. It needs to acknowledge the core pressures that are pulling in each of the trends we have mentioned. It also needs to be grounded in the best of what is known about how and what people learn so that the innate abilities and capacities and predispositions of all people everywhere can be better embraced and channeled.

3. THE VARIETY OF REAL WORLD LEARNING OUTCOMES

All the world is my school and all humanity is my teacher. ~George Whitman

The place to begin, we suggest, is with an understanding of everyday learning from life. Most people, when talking about schooling and education, uses the word “learn” happily and freely as though its meaning were obvious. Indeed, the meanings of “learn” and “learning” seem to be so obvious that they are used more than 100 times in *No Child Left Behind*, and never defined once.

It is true that many attempts have been made over the years to explore the many meanings of “learn” and “learning.” One example goes at least as far back as the 1956 framing of *Bloom’s taxonomy* (1984) and its reworking (Anderson & Krathwohl, 2001). Other examples include the *SOLO taxonomy*, of Biggs & Collis(1982), *Webb’s Depth of Knowledge Guide*, (2009), and a variety of attempts to map these objectives on to differing ways to use technology (e.g. Carrington, 2013). Excellent treatises on how to teach more effectively also use the nature of learning as a starting point. (e.g., see Jones, 2013; Reigeluth, 2011).

Most of these attempts to unpack the meaning of learning are framed with education and schooling in mind. So let’s adopt a different tack. Imagine that we are exploring the way that the words “learn” and “learning” are used in

the course of everyday life. Without seeking to be complete, nor completely accurate, here are eleven common usages (there are more) of what it means to learn:

1. We might have to learn a phone number or the way to barbeque chicken. Here “learn” means *memorize and acquire information*;
2. We might have to learn why the weed killer which is great for killing the clover that covers our beautiful lawns could also harm the environment. Here “learn” means *grasp core concepts*;
3. We might have to learn why social and economic systems can be influenced but not controlled because they are self-organizing systems that emerge as the cumulative result of the beliefs of all the individual members. Here “learn” means *develop a deep theoretical understanding*;
4. We might have to learn how to design and market a website and, perhaps, know a lot about web design and do it really well. Here “learn” means *acquire a skill or skill set and become expert*.
5. We might have to learn how to read the situation and react appropriately when, say, meeting new people unexpectedly in a friend’s apartment. Here “learn” means *developing new situation lenses*.
6. We might have to learn the reasons why we (men and women both) often select the wrong sort of partners or procrastinate. Here “learn” means *become aware of*;
7. We might have to learn how to avoid impulse buying, delay gratification, and plan for the longer term. Here “learn” means *develop some self mastery*;
8. We might have to learn how to work and connect better with others. Here “learn” means *develop more social intelligence*;
9. We might have to learn how to adjust to new cultures or situations or technologies. Here “learn” means *become more adaptive*;
10. We might have to learn how to design a yacht in radically different ways in order to win a yacht race such as the 2013 America’s cup, where the hulls of the competing catamarans were literally above

water much of the time. Here “learn” means *be creative and generative*;

11. We might have to learn how to function more effectively as citizens who need to work together to survive and thrive in a very complex world. Here “learn” means *grow up and become more mature*;

12. We might have to learn a more general way of seeing and being ourselves in the world. Here “learn” means *develop mental models and worlds of personal meaning*.

And so on.

One word, many meanings. And all of us use some or all of those different meanings at different times in our everyday lives. Yet most of those core meanings are left at the door when discussions about schooling and education and test scores take center stage.

Left at the door? Everyone does it. Parents talking about school and what their children are *learning*; reporters writing reams of stuff about every facet of education and the impact on *learning*; educators at every level, from teachers to administrators, who want to improve *learning*; bloggers flooding cyberspace with opinions about schooling, education and *learning*; policy makers intent on raising standards by having students *learn* more and *learn* better; politicians who make “better education” and “closing the achievement gap of *learners*” front and center of their campaigns; and (this is perhaps the most breathtaking), vast numbers of research scientists and academics who research and study and report about *learning* without bothering to define it.

A Generic Definition of “Learning”

Rather than leave the word “learning” undefined, let’s look for an umbrella process of which all of these elements are a part. In our view, the place to begin is with the dance of *perception* and *action*. Every human being (and every living organism to some extent) must be able to “read” its environment – the essence of perception – and be able to act appropriately in an on it – action (See Caine & Caine, 2011). These are not two separate and distinct

processes. Rather each is a part of, and interacts with, the other. Even basic sense perception, at the level of responding to a bright light, calls for parts of the body to be positioned and move appropriately (Noe). Note, also, that these two processes are central to all experience.

We suggest, then, that a generic definition of meaning should emerge out of what it takes to change perception and action in the course of everyday life.

“Learning” defined: *“Learning” means making sense of experience and developing capacities to act in and on the world (Caine and Caine, 2011)*

All the aspects of learning identified above are aspects of this new, larger, generic process.

4. REAL WORLD COMPETENCE: A PURPOSE FOR EDUCATION

Education is preparation to live completely. ~Herbert Spencer

Let us assume that the goal of any society that supports some sort of intentional way of educating its citizens is for those who receive education to be better able to survive and thrive in the real world. In a large sense education is never about awards or test results or even international bragging rights. In our view *the larger purpose of education is to provide citizens with something like real world competence.*

Of course both learning and education continue throughout life, in both formal and informal ways. But given the vast and deeply entrenched system of formal education that occupies so much space, time, money and effort almost everywhere, let’s select a critical moment as a reference point for the success or failure of education. And let’s make this moment the day when kids leave school after their 12 years or so in the system. Graduation. That is the point in time when they need a sufficiency of real world competence.

This is not to ask for them to be expert in everything. Rather, it is for them to have some genuine real world competence in some spheres (say reading or social intelligence), and for them to have adequate foundations for pursuing other spheres (say medicine or marketing) at a moderately high level.

What, then, is real world competence?

We suggest that educating for real world competence means that all the twelve types of learning outcomes listed above are sought and developed in the educational system - simultaneously.

Every single one of those outcomes is part of something larger. Each overlaps with all the others as they cumulatively contribute to the capacity of students to function in the real world.

Note that the goal of covering ALL these learning outcomes could be ideologically neutral. To our minds they can and should emerge in settings that are liberal or conservative, public or independent or home-based, owned by the state or by business or by non-profits or by other community organizations. It is possible to create institutions called “school” that shoulder much of the burden, and that can work very effectively when supported by the larger context in which they are embedded. They just have to map onto this larger natural process.

Rather than wait for schooling to end and life to begin, let’s do what human beings do naturally. Let’s treat education as a process that begins when life begins - with all learning outcomes in play or waiting in the wings while being primed from birth.

5. HOW PEOPLE LEARN

Study hard what interests you the most in the most undisciplined, irreverent and original manner possible. ~Richard P. Feynman

In order to educate for real world competence, we need a state-of-the-art grasp of how people learn naturally. In general, that is because the task is complex and it is essential to take full advantage of the inherent capacities of all learners. In addition, it is because research is beginning to show that we are all endowed with capacities that can naturally be accessed in the service of all of the named outcomes.

The core point is the need to take the notion of experience seriously. And yet there seems to be very little understanding about how experience actually works. In part that is because of a piecemeal approach to research. The parts, the different aspects of learning, matter. But they are still only parts. The question, we suggest, should be how do all these parts help to explain the overall learning process?

One of many problems is that scientists, including neuroscientists, still disagree with each other. And yet the two of us want to call upon the science of learning to explain the connections between different sorts of learning outcomes and different approaches to instruction.

One simply has to select a place to begin that seems stable and is supported by one's own experience. In our view, the best way to view the science of learning is to see that the body, brain and mind function as a whole system. Thus, neuroscientist Damasio (1994) says that each of us interacts with our environment as an "indissociable whole." Amongst other things:

- *We are innately driven to search for meaning.* One aspect of that is the perpetual search for what Bateson called "the patterns that connect." Among the aspects of the search for meaning and patterning are the potential ability to categorize, grasp abstract concepts, develop and test hypotheses and theories, represent aspects of our world symbolically, think in the abstract and use our imagination.
- *We think with our feelings* (Ariely, 2010; Damasio, 2010). That means that the way one feels about any idea or process impacts what it

means and how deeply we understand it. So one of our favorite headlines of all times was in the Los Angeles Times many years ago. It was about a Nobel winning scientist and was titled “The man who loved molecules.”

- *We think with our bodies.* Scientists call this embodied cognition (Shapiro, 2010). That means, in part, that sensory and physical experiences impact understanding. So students may gain a deeper sense of both friction and gravity when they are pulled along a corridor on a blanket and are then asked to compare that with being pulled along on a skateboard.
- *We think together.* Scientists (Lave and Wenger, 1991; Gee, J.P., 2010) called this situated cognition. We all make sense of things through the ways in which we talk about and deal with them socially and collectively. A classic example is the way that the behaviors and symbols used in texting have been co-created by the millions of people for whom texting is now a way of life.
- *We naturally process parts and wholes simultaneously.* On the one hand are all the natural wholes in life – stories, projects, games, lived situations. On the other hand are all the individual elements and ingredients in each whole. Koestler (1967) invented the word “holon” to describe this relationship (See also Wilber, 2001) because everything is both a whole that has parts and is a part of something larger.
- *We function at higher levels when challenged and interested than when overly stressed and helpless.* In fact when the survival response kicks in we literally lose access to some of our higher order functioning and revert to primitive and deeply programmed behaviors and experience a narrowing of the perceptual field (Combs et. al., 1988). LeDoux (1996) describes this in terms of the *high road* and the *low road*. Our inference has been that the optimal state of mind for learning is what we call relaxed alertness – a balance of high intrinsic challenge and low threat, so that the survival response is not constantly in play.
- *We have a wide variety of memory systems.* These include rote memory

and capacities to be programmed, an autobiographical memory system that records the story of our life, and the capacity to master complex intellectual and physical skills and procedures. Further, neuroscientist Fuster (2003) contends that all of these memory systems are interactive and interconnected.

There is more than this, as we have demonstrated over the years with our brain/mind principles of natural learning (For our synthesis of the science of learning, see Caine and Caine, 2011; Caine and Caine, 2010; Caine et. al. 2008 ; Caine and Caine, 1994; www.nlri.org).

However, there is enough so far to show that learning is neither a mechanical nor only an intellectual process. It is partly like what happens in a chemical factory. Or, indeed, in the complex and messy dynamic inside each one of us as we digest a meal. All the parts of the system play a role – the mental part of it is in a constant interactive dance with physical movement, emotional energy, and the ongoing connections with other people and the larger world.

So what are the practical implications?

- On the one hand, the entire personal, social and physical system of any individual is engaged in learning. Another way of saying this is that the grounding of every single one of the learning outcomes listed above is part of each of our biological and psychological heritage. And they are all in play, in some way or another, all the time.
- On the other hand, the various aspects of these systems interact in different ways and in different combinations. So the sort of outcome that is generated depends on how, more precisely, head and heart, brain and body, individuals and groups, interact. And because so much of that happens without being noticed, or is almost invisibly shaped and manipulated by the system in various ways, we end up with outcomes that may be totally unrelated to what we think and believe we are achieving.

6. SITUATION LENSES– BEING ABLE TO “READ” AND ACT IN AND ON THE WORLD

We begin with the conviction that the role of man was not only to be in the world, but to engage in relations with the world--that through acts of creation and re-creation, man makes cultural reality and thereby adds to the natural world, which he did not make. ~Paulo Freire

Real world competence is an emergent outcome in which the various individual outcomes listed above develop and connect. However, there is an aspect of real world competence that is almost universally overlooked or misunderstood. It is the hugely critical shift that needs to take place from memorized routines and theoretical understanding to what we call situation lenses or perceptual knowledge.

Developing Situation Lenses and Real World Competence

When a person grasps a concept deeply, it can be used in routine real world contexts. Thus, a student would be able to use a spreadsheet, write an article, and assess at least some of the forces acting on some ice as it is thrown against a wall.

Real world competence calls for more. *It is the ability to spontaneously see larger patterns in unexpected and complex environments.* It is all well and good to be able to explain how racism and power have played out in political events. It is a different thing altogether to see racism and power play themselves out in a current election in which one might have a vested interest and be involved. Similarly, one might be quite good at explaining how an economy works according to different theories. Something profoundly different is needed to see, say, the complex current of market forces, regulation, and media spin in the economy to which one is subject, particularly, say, if personal career or investment decisions have to be made .

Traditionally these differences are thought of in terms of transfer of learning, and so the advice to educators is to teach for transfer. This has an element of

truth but misses the larger point. Real world competence is dynamical knowledge, and is qualitatively different from theoretical understanding.

The key to success in the real world is being able to *read* that world, to see what is happening. So every subject, in essence, can provide a new set of lenses – these could be called situation lenses. In everyday language, a person will start to “get a feel” for a subject or skill or occupation. When a felt meaning (Caine, 1994, based on Gendlin, 1981) develops, a person not only knows some math, he or she can think mathematically; not only know some history, but thinks historically.

Those situation lenses have to be generated inside a person. For them to develop, all the subsystems of body, brain and mind need to interact while content is used in the course of many, complex, real world experiences. That is because, as mentioned above, a human being - body, brain and mind - interacts with its environment as an indissociable whole (Damasio, 1994). The power of experience is that it reshapes and reforms and transforms intellectual knowledge into what we initially called perceptual knowledge (Caine and Caine, 1994) – the situation lenses mentioned above – by engaging all the subsystems interactively and simultaneously. It takes a lot of complex, ongoing experience, with many iterations and variations. There needs to be real world feedback, and detailed guidance and coaching in real time. And the experience needs to be processed, both informally over, say, a cup of coffee and more formally with a coach or teacher.

This is why we described learning as akin to what happens in a chemical factory or in the process of digestion. Experience engages the whole system in ways that naturally call for the interaction of the various capacities and aspects of learning spelled out above. They are naturally organized by experiences that make sense.

What can teachers do? In our view, the absolutely indispensable requirement for the development of situation lenses is lots of relatively real word

experience in which the core content is embedded. That is why so many people argue so passionately about experiential learning. So students need to be immersed in projects that are *adequately complex*:

- there must be enough time for events to play out realistically;
- there must be enough space for events to be experienced adequately;
- there should be enough social interaction for many of the small details that occur in everyday life to be present and to impact the projects;
- the project should be complex enough for hard thinking to be needed and tough decisions to be made.;
- What could be called “higher order” thinking – self-regulation, metacognition, and the executive functions - need to be constantly embedded in the experience.

But note. All of the individual actions and strategies that teachers and learners have used for time immemorial can be relevant aspects of experience:

- *Telling, showing, and guiding;*
- *Self-directed problem solving;*
- *Thinking and puzzling and analyzing;*
- *Creating and generating new processes;*
- *Rote practice and mindful practice;*
- *Experiments and trial and error;*
- *Asking questions and being questioned;*
- *Reflection in and on experience and the active processing of experience;*
- *Directing, coaching, guiding, exchanging and co-creating.*

They *all* belong! All of these and more. Each and every process and strategy can be and is an aspect of experience. What matters is *how* they are experienced.

And that is what great teaching and great systems of education do well.

7. THE DIFFERENCE BETWEEN TEACHING STRATEGIES AND AN INSTRUCTIONAL APPROACH

The whole is more than the sum of the parts because the whole belongs to a higher plane than the parts. ~Anon

Educators everywhere are in a constant hunt for new, improved, better and more effective teaching strategies. There are very useful compilations of such strategies. See, for instance, the glossary of strategies from the *National Center on Educational Outcomes* at the University of Minnesota, or the material compiled by the *Center of Research on Learning and Teaching* at the University of Michigan. And this is but a taste of the immense world of resources readily available to educators online, which is itself growing exponentially as the promise of technology unfolds.

But something is missing from lists of strategies if we genuinely want to understand instruction. Sometimes it's there but unstated; sometimes it's organized and sometimes not; but it's usually not recognized and not considered. *It's the difference between a strategy and a philosophy of instruction – an instructional approach.* The problem is then compounded because the same words can be used to describe a strategy or an approach.

So what's the difference and why does it matter?

“Instructional Approach” Defined

An instructional approach is part of an educator's mental model. It is the totality of his or her view of how people learn and what, generally, an educator should be doing. Sometimes it's tacit – unstated and taken for granted - and sometimes it's articulated clearly.

The distinction is vital because an instructional philosophy embraces all the related facets of instruction:

- *Opinions about and ways to address learner states of mind, ranging, say,*

from the use of threats and punishment to building a sense of safety and engagement;

- *Notions of classroom management and a good classroom climate*, ranging from the use of rewards and punishment to maintain order to developing self-organizing classrooms sustained by purpose and relationship;
- *The instructor's view of learning objectives and outcomes*, framed in terms of the 12 learning outcomes dealt with in this report;
- *Modes of assessment*, including standardized tests, performance assessment, self-assessment and community responses;
- *The use of time*, and the balance between mandated small chunks of time to larger and more fluid chunks of time that make large-scale long-term projects feasible;
- *The role of technology*, and the differences between, say, using apps and using technology in the course of completing a project; and
- *The way of connecting with the larger context*, including the school and the community beyond.

Example: The Learner's State of Mind

Most of the time, we think of teaching in terms of the strategies that a teacher uses. But there is more. How well a student learns also depends, for instance, on his or her state of mind.

In our view, research across the board suggests that the optimal state of mind for complex learning is one of *relaxed alertness* (*12 Brain /Mind Learning Principles in Action*). It is a combination of low stress and threat and high intrinsic challenge, as we show briefly, above.

Strategies impact state of mind

This is where the process becomes more complex. Not only does a strategy impact a learner's state of mind . . . but the learner's state of mind also impacts how much benefit is derived from the use of that strategy. Two examples:

- Explicit directions, clear explanations, and enough practice and rehearsal to ensure memorization of facts and routines can work in two different ways. On the one hand, they can provide clear structures and opportunities for success, that together generate a sense of safety, allow learners to feel relaxed and competent, and so build foundations for high level performance. On the other hand being told what to do and rote memorization of stuff that is meaningless can be hugely frustrating and depressing. When this is accompanied by the sort of discipline that makes the learners' interests and concerns irrelevant, and pays no attention to what they actually need, the survival response is triggered. At that point safety becomes the learner's primary concern – and this is done by trying to please the teacher.
- Rigorous thinking through processes, from Socratic Questioning to problem-based learning, can lead to the sort of deep understanding that is profoundly empowering and a strong boost for intrinsic motivation. However, not all rigorous thinking is equal. If the learner's own questions are ignored, if fundamentals have not been grasped, if some people are quicker than others and show them up, if problems seem silly, if there is no opportunity to physically experience core concepts so that words (such as "friction" or "resistance") don't actually mean anything yet, then forced "thinking" can also trigger a sense of frustration and helplessness.

8. THE GUIDED EXPERIENCE APPROACH

Experience is the teacher of all things. ~Julius Caesar

At a very general level the GEA can be framed in terms of three interactive components that together make it possible to incorporate and integrate the various practices and elements described here (See Caine and Caine 1994, 2001, 2011; Caine et. al. 2008). They are:

- The *orchestrated immersion* of learners in complex experiences in which essential content is embedded;
- An optimal and sustained state of mind that is a blend of low threat and high intrinsic motivation. We call it *relaxed alertness*; and
- The ongoing *active processing* of experience so that it is continually mined for the various learning outcomes that are being generated.

Core elements in instruction

To expand a little, albeit very briefly, we would expect the following elements in the course of teaching any subject (Caine and Caine, 2011):

- *Multisensory Immersive Experiences*. These are direct, real-world experiences. They often constitute a student's preliminary exposure to a new subject or material to be explored. They may be brief and focused, or substantial and ongoing as in complex real world projects.
- *Sensory Processing of phenomena generated by the experiences*. This expands awareness of the details and previous experience and triggers greater interest.
- *Student centered adaptive questions*. These are based on authentic student interests and may emerge out of their own lives, interests and confusion.
- *Planning, organizing, and research*. This represents the wide range of ways in which students might look for and/or be exposed to specific, targeted content. Here we find real inquiry into a topic. It combines such elements as collective and individual inquiry, teacher-led sessions, explanations, and direct instruction on occasion.
- *Rigorous thinking*. Teachers facilitate discussions, analysis and rigorous thinking by and between students in a multitude of ways, to ensure that they engage deeply and in a personally relevant way with the subject matter.
- *Coaching and skill development*. A wide range of skills, having to do both with content and personal development, will be called upon

and enhanced.

- *Constant active processing.* This ranges from practice and rehearsal to discussions and reflection, and is a primary vehicle for teacher guidance, collective learning, real time feedback and formative assessment.
- *Creating a product or real world performance of some kind.* The concern with action and performance both helps with the learning and provides a solid basis for assessment of the many different learning outcomes.
- *Formal feedback and summative assessment in some meaningful and useful form.* This is of value to the learner and also provides educators and others with indicators about student accomplishment of the various learning outcomes. Standardized tests and grades play a useful role in context, but are only part of a range of assessment that can include self-assessment, performance assessment of various kinds, and both informal and formal responses from the wider community.

As we researched the GEA in the 1990's, it became clear that some fundamental underlying conditions were necessary to make it happen, and that the educators who could do it had a set of core attributes (Caine and Caine, 1997b).

They Tend to Empower Students, Rather Than Use Power Over Them

The reason is that for the GEA to work, students must have the opportunity to ask their own questions, express their opinions, and deal with their own confusion.

An example is shown in a superb video by Dorothy Fadman (1988) called "Why do these kids love school." One student, talking about why he loved Peninsular (a K-8 school in California), said that it was because, when he asked questions, he was not punished for "talking back."

For students to have that sense of self-efficacy, teachers must have self-efficacy in spades. They need to be able to deal with and, if necessary, stand up to the power wielded by the larger system. They need the ego- strength to

allow students the space to ask about what matters to them. They need to be able to resist “being right” and explaining why this is this and that is that. They need, above all, the patience to invite students –individually and collectively – into their own thinking.

They can let go of some control and, rather, develop the relationships that promote self-organization

“Letting of control is so hard!” ~Teacher with whom we worked.

Classrooms and other places where the GEA plays out face a tension between several competing needs.

- A group of students are pursuing both individual and collective needs and purposes, juggling resources and seeking to make things work.
- Because much of the GEA replicates or actually deals with the real world, crises erupt and the unexpected is common-place.
- At the same time there is a need for a relatively systematic path and procedure.
- And the project itself also deals with a great deal of academic content that needs to be embedded, dealt with, and processed.

We found that the teachers who can manage this complexity do not micro-manage. They have the capacity to let go of a great deal of control, which is difficult in and of itself. At the same time, they have mastered the art of helping students develop relationships and pursue what is meaningful so that much of what happens self-organizes. It largely manages itself!

They have broad cognitive horizons

What we see depends mainly on what we look for. ~John Lubbock

With many students pursuing different goals, research different topics of different aspects of the same topic, and with all of these parts needing to be connected to to each other, to the curriculum, and to other subjects and

facets of life, teachers are in a constant complex dance.

- They need to be expert in their subject area, like Jay Vavra at High Tech High. That is why Finland is so clearly doing the right thing in wanting all teachers to have a masters degree. It is only when one knows a subject very well that one can jump about in it quickly and easily.
- They also need have a sense of connectedness and wholeness, to see that everything is related to everything else. The broader and richer and deeper this grasp of connectedness, the easier it is for a teacher to help a student find links between ideas, areas of interest and so on.

The two attributes together are we call broad cognitive horizons. We should note, however, that the key is for these attributes to be present in the learning environment, and not necessarily in each individual teacher. It depends how the system itself functions.

They Have a Sense of Process

Learning is developmental so students need time and opportunity to master the various learning outcomes in non-linear ways over time. Educators need to be able to facilitate this development. Here, by way of example, is a middle school teacher reflecting on teaching writing:

I care about the fact that they understand the process ... that they understand the stretching and the pulling and the not accepting and the fight you have to have with yourself to keep going and to keep making it productive and to keep changing it and to keep making it something that is worthwhile . . .
(Caine and Caine, 1997b)

Now process is complex. For instance:

- everything takes time;
- there are rhythms and cycles to everything;
- growth always depends on feedback and responses to feedback;
- development is never in a totally straight line.

While there is always some need for systematic time management, this must

be adequately blended with the unfolding nature of learning with its cycles and rhythms and tangents as well as its spontaneous and sudden changes.

How Learning Outcomes are Addressed by the GEA

We contend that this process, when adequately carried out, naturally integrates all 12 learning outcomes that together are the foundation or real world performance.

Academic outcomes

The process itself allows for the different sorts of “academic” outcomes that are some of those in the list of 12 outcomes in Section 3. Information is acquired, some through memorization if necessary; routines are mastered; concepts are grasped; theoretical foundations are examined and expanded, skills are developed and the foundations are laid for situation lenses.

Personal development

In the course of this ongoing and complex process, competencies and capacities -some more of the set of 12 outcomes - can be developed with skillful teaching and that are part and parcel of developing as a human being.

These include:

- Learning how to monitor, regulate and take charge of one’s impulses and ways of acting;
- Becoming more proficient at working with others;
- Developing one’s executive functions including the capacity to plan and manage time and resources;
- Becoming more self-aware and gaining deeper insight into one’s own ways of learning;
- Gaining maturity; and
- Forming and deepening one’s world of personal meaning and one’s mental model of reality itself.

Creativity and generativity

Most formal education is backward looking in the sense that it focuses on

having students master what others have previously dealt with and discovered. This is how almost all standards and curricula are formulated. Yet at the same time there is more and more of a clear need for students to become more creative, to generate new ways of looking at things, to create some of that new knowledge.

Again we need to loosen the concepts that constrain us, this time about the predictable nature of learning outcomes and their specificity. One way to grasp this is through systems theory. In essence, we suggest that creativity is an emergent phenomenon of living systems functioning well. Creativity is a byproduct of a fully engaged learner in an interesting, safe, stimulating, resource rich and well- functioning environment that is open to possibility and innovation from students and teachers alike. It is encouraged and facilitated, for instance, by what two colleagues of ours call emergent teaching (Crowell and Reid-Marr, 2013).

One educator who was aware of how creativity can emerge was Georgi Lozanov, the Bulgarian psychotherapist who developed what he called Suggestopedia, (Lozanov, 1979) which was a precursor to “Accelerated Learning.” Lozanov also coined the term “non-specific mental reserves.” He argued, and in our view systems theory now supports the notion, that when a human learner is functioning at high levels in an integrated way, a natural secondary outcome – an emergent property - is the activation and appearance of these non-specific reserves. They are inherently unpredictable, but can show up in a new interest, a new way of seeing and doing things, an “unexpected” talent, and so on.

The challenge is to avoid spelling these out ahead of time. Rather, the context allows them to emerge. That is extremely difficult in a command and control environment. But the potential and latent possibility are always there, just waiting to be activated and invited in.

Schools as apprentice communities

The GEA can be implemented within a single classroom and it can be implemented as a school wide policy within every classroom. Most powerful and thoroughgoing, however, are those instances when the philosophy and process permeate the operations and functioning of an entire school. In situations such as this, every subject is taught across the curriculum, modeled and lived.

The best term we have encountered to describe systems such as this is the *apprentice community*. In effect, students at all ages experience content in operation, are guided as appropriate in their actions and decision making, deal with real world feedback – but are in a safe environment where mistakes are an expected part of learning and where even dealing with mistakes is something that can be coached and mentored.

The examples below illustrate some of the range that is possible.

9. EXAMPLES OF THE GEA IN OPERATION

The difference between school and life? In school you're taught a lesson and then given a test. In life, you're given a test that teaches you a lesson.

~Tom Bodet

The best way to develop and master the GEA is to learn from those who are already doing it and have manifestly succeeded. Note, however, that they tend to have developed it in their own way, using their own terms, and framing their own understandings. Here are some of those who seem to us to be kindred spirits doing the similar things:

- *Reggio Emilia*, (Edwards et. al., 2011) widely regarded as the best early childhood education program in the world. It was developed in Northern Italy, shortly after the end of World War II and with very few resources.
- *Great service learning* (Eyler et. al., 1999). At its best, service learning involves students in long term, real time complex projects where they

interact with the community in a multiplicity of ways. At its heart is the notion of embedding content into the project and the ongoing processing of experience so that learning on multiple levels is occurring.

- *The Center for Ecoliteracy* (<http://www.ecoliteracy.org/>). The projects of the center are grounded in Fritjof Capra's formulation of the theory of living systems. That is the intellectual frame for the large scale, complex projects upon which schools embark - an example of which might be growing vegetables in gardens that feed communities of various types.

Perhaps our favorite kindred spirits are two schools about which we write in *Natural Learning for a Connected World (2011)*. One is *Bridgewater Elementary*, an exceptional school in Adelaide that we encountered in the context of our work with a 10 year program carried out by the South Australia Department of Education called *Learning to Learn*.

Another is *High Tech High*, a cohort of nine schools forming the only charter school district in California. Many of its programs and courses can be found online at its own site (<http://www.hightechhigh.org/>) or at [www.Edutopia.org](http://www.edutopia.org). Here is a brief description of one of them - *The DNA of Learning: Teens Tackle Animal Poaching Through Genetics*. (<http://www.edutopia.org/high-tech-high-biotech-video>).

A biology class is being conducted for 11th grade students by teacher Jay Vavra. Students, wearing white coats, are in a lab, also well furnished with computers. Someone enters the room, seeming to carry samples of meat. So far, so good. A well- equipped everyday school lab, but not unusual.

Except that in many ways it is. The school lab is for real. Animals are being poached in Nairobi, Africa. These 11th grade students, using simulated bush meat, are investigating ways of identifying animal remains using DNA bar coding in order to assist game wardens in Nairobi. Nine of the students actually visited the country the year before. Their teacher is online with their

African collaborators. "The ultimate goal of the project is to develop research techniques to combat poaching by identifying the meat and fur of illegally hunted wildlife." In fact the final project for the students will be the creation of an on-the-ground forensics workshop to teach the process to game wardens in Africa.

"I really believe in original research," says their teacher, Jay Vavra. He has worked in the biotech industry as well as archeology. He constantly circulates around the room, but discipline is not a problem. By and large the students monitor themselves, so the teacher is free to stop, talk, question, guide, and make suggestions as he seems fit.

What else do we see? Some examples:

- *Clear guidance in the practical skills of doing good science, including reminders from the teacher to "check it out, describe and write down some observations . . . what it smells like, what it looks like."*
- *A blend of relevant subjects that are being taught together, including molecular biology, bioinformatics, evolution, biochemistry, ecology, zoology. The blend, of course, is how they are expressed in the real world.*
- *Analysis of results and constant discussions between students about how best to proceed.*
- *Emailed and online reports from game wardens in (Uganda) being fed directly into the classroom.*

As for assessment, the students in this class are not tested. They are graded on their contribution to the final class product which is the forensics workshop. In addition, at this school they will all be presenting their process and findings, in a variety of self-determined ways, to parents and other members of their community. And as for test results, given that there are no tests? Well, the school itself has a very high graduation rate, and students who graduate from this school perform superbly on national standardized tests and are accepted into colleges around the country at very high rates.

It is also clear that the students are deeply engaged in a very rigorous process, both from the video and from comments such as this one:

“I know everyone is really serious about this, it’s a serious issue, but is really a lot more fun than you would be able to do in any other classroom cos you’re actually ... it gives you kinda a sense of importance (happy smile).”

The workshop was actually developed and presented, and has a website devoted to the project. (<http://www.africanbushmeat.org/about.html>.)

We invite you to watch this video, and others from High Tech High, Edutopia and elsewhere. There are countless examples of the various processes, elements and learning outcomes that we describe in this article playing themselves out.

10. SYSTEM REQUIREMENTS AND CONSTRAINTS

It is simply human nature to assume that our world-view is correct. ~Jim Benson

A system of education both sets what is targeted and constrains what is possible. It both frames and suppresses learner and teacher capacity. And so it both shapes and can distort the process of learning and teaching and the conversation about education. Let’s look at some examples.

Standards

While un-schoolers may disagree, the vast consensus is that formal education needs to have some specific content areas and a curriculum of sorts. Whether or not it is specified or emergent, it is appropriate to want kids to be literate, somewhat numerate, to have some grasp of their origins and culture, a capacity to think analytically and be creative, an adequately broad world view, and so on. (We would argue that all un-schoolers also have a tacit

curriculum).

However, using the word “standards” to talk about content and curriculum is intrinsically absurd because the term has at least two meanings and one extra usage that are always conflated in a way that confuses. First it refers to the content of the curriculum, as in “The Common Core Standards.” Second, it refers to the quality of outcome as “his performance is substandard and hers is of a high standard.” So one might have to say that her results according to the standards were sub-standard. Third, the more specific the standards the more is there a tendency towards standardization of teaching and procedures. This is not logically necessary, but the suggestive power of the word “standards” is enormous.

Standardized tests

The problem with standardized tests is not their mere existence. In the real world, everyone from taxi drivers in London to golf officials to mechanics might have to pass written and oral tests to demonstrate a grasp of basic facts and procedures. So London taxi drivers must pass a preliminary test to show that they have acquired “the knowledge,” the routes and regions and roads of London (The Knowledge Boys, <http://www.pbs.org/saf/1101/features/knowledge.htm>)

Equally accepted is the fact that mastery of facts and rules and basic routines is never enough to demonstrate real world competence. People have to be able to perform on real tasks in both planned and unplanned contexts in real time. One would be wary about being operated on by a surgeon, for instance, who had never before performed a particular operation.

What matters, we suggest, is how the standardized tests are used within the larger system. One core issue that we addressed in the introduction is the radical differences that obtain in the way that testing and test results are viewed. Many places, Korea included, aim directly and specifically

for test results. Education is driven with testing in mind. Other places, Finland included (until recently, perhaps), use occasional tests but generally view results on standardized tests as the byproduct of other things. Education is driven with testing largely out of mind. The Finish approach is messier and deeper and more systemically complex than the Korean approach; and much more useful for those who care about real world competence.

The use of time

The way that time is organized both makes deep learning and instruction possible, and can be a huge constraint on what is possible. Complex projects need large blocks of committed time, blocks measured in hours, days, weeks and, sometimes months and years. This is the only way that sophisticated research can be handled, performances arranged, and deep connections made between people. And yet this is a world with vast numbers of competing needs each hungry for time. And so scheduling and time management including the use of brief blocks of time, are also essential.

Balancing the two is always a challenge. One reason why High Tech High is so good is that it manages both. Eliminating either of them is a recipe for disaster. More specifically, the more fragmented time is, particularly in short periods of, say, just 40 minutes, the more impossible it becomes to implement the GEA and learn and teach at very high levels.

Safety, management and discipline

Maintaining a safe environment is vital for achieving and sustaining high standards of learning and great teaching. Remember that the optimal state of mind for learning is one of relaxed alertness, of low threat and high intrinsic challenge. That is why generating a healthy learning climate, self-organized around what matters to students as well as what matters to the larger system, is critical. It creates psychological safety, *inner* safety – a feeling of self-efficacy and self respect - that is essential for learners who need to take risks, try things out, question their own beliefs, have a sense of

belonging, and so on.

From this perspective, a law-and-order approach to classroom management and maintaining discipline can be an essential fallback option. However it can never be primary if the goal is to generate the sort of dynamic orderliness that allows for students to genuinely take charge of their own complex projects and processes. When the thrust of the system's approach is to "make" students behave with a strict adherence to the dictates of those in authority, backed by a strong regime of threats and punishment, the process may provide some physical safety in some situations, but it severely inhibits and suppresses student self-efficacy, empowerment, and creativity.

11. IMPLEMENTING THE GUIDED EXPERIENCE APPROACH (GEA)

If you don't know where you're going, you might not get there. ~Yogi Berra

Getting there from here is difficult. Here we briefly note two paths for creating the larger system within which the GEA is the dominant instructional approach. More usefully, we want to identify places that those who seek to move in the direction of which we speak can visit and from whom they can learn. The two paths are:

Path 1: set-up a system that implements the GEA from the first day, with the support of majorities of all stakeholders. It will need a coherent philosophy, framed in one's own terms but which, we believe, largely mirror the ideas and practices that we survey in this report. Here are some examples, two of which have already been mentioned:

- *Reggio Emilia in Northern Italy*, a childhood education system that was developed in a Catholic country and with very few resources.
- *High Tech High*, the set of 9 schools in California that was launched with many more resources in the 2000 but with the same general philosophy.
- *The non-profit Manchester Bidwell Corporation (www.*

<http://manchesterbidwell.org/>, founded by Bill Strickland, and the training centers that they have developed, the first one being the Pittsburg inner city area.

Path 2: Adopt a long term, system wide developmental approach with the support of a majority of stakeholders and wielders of power, and with a coherent philosophy. This is the route taken by Finland and South Australia. We have only read about Finland, but we were 2 of the 20 or so International Colleagues that supported the South Australian effort. We conducted the first 2-day workshop for leaders of the first cohort of schools, and visited at least once a year for the entirety of the project, which has now become the foundation for pedagogy in the entire state (<http://www.learningtolearn.sa.edu.au/tfel/>). We also constantly marveled at the grasp the leaders of the project had of systems theory, learning theory, group process, relationship building, the political and social context in which they were operating, and their ability to set up the conditions that allowed for a successful outcome.

There are many lessons from both approaches.

- A first is that the process needs to be both top down and bottom up. It is led but it is also co-created and emergent.
- A second is the absolutely indispensable need to take enough time. Both the programs in Finland and South Australia, for instance, took many years to implement and develop.
- A third is that consistent, high level professional development is needed that includes skill development, a sophisticated grasp of learning theory, the building of a healthy climate and learning community, and continuous and intensive reflective practice. Our process is spelled out in detail in our 2010 ASCD book on the art of learning together (Caine and Caine). More generally, the GEA should be used in professional development if it is ever to be successfully applied by professional educators.

Remember, after all, that the process as we describe it here is grounded in how people learn naturally. Yes, it is true that we live in a high-tech globalized world where success on many levels is measured in nanoseconds. But we are still living organisms, human beings. And we occupy space in an environment that has always made room for the very small and the very large, the very fast and the very slow. The process that we are advocating here has a rhythm to it. Success is not just a matter of urgently following a recipe and making corrections when one goes off course. Success takes time.

12. NEW BEGINNINGS

Don't ever live vicariously. This is your life. Live. ~Lavinia Spalding

Even though much has changed and, in a sense, there is no going home, some things don't change, or at least they should not. The threat of the digital age and the increasing speed of things is that it will rob us of our humanity.

- It is simply not true that because many things are speeding up, that everything needs to speed up.
- It is simply not true that, because some change is urgently needed, everything has to be done in a hurry.
- It is simply not true that because so much can be done digitally and online, that every aspect of human life – and every aspect of education – can be handled digitally and online.

We are, actually, still human.

We do have to think smarter, but solutions are available. For example, one key to dealing with enough information is to stop trying to simply teach a lot of little bits and pieces. A curriculum grounded in big ideas, and a process that helps to examine both subject matter and life through the lenses of those big ideas, makes it easier to “cover” curriculum by thinking more broadly and more deeply. Note, for instance, how the notion that *order*

emerges out of chaos can find expression in every subject without exception.

We appreciate how rapidly the world is changing, and how inadequate much of the formal education system is to deal with change. The challenge, we suggest, is to develop an adequate platform from which to launch our individual and collective response to the emerging future. That is the spirit in which we present the GEA.

People always have and always will learn from experience. There always have been and always will be a variety of learning outcomes, all of which together are an expression of our view of real world competence. Learning and teaching (in their broader meanings) will always be joined and will always function best in appropriate conditions. Both stability and change will always have to partner in some way for people to survive and thrive. New and more powerful ways to see the patterns in things – the patterns that connect – will have to be developed, irrespective of how much information floods the world and our psyches, because patterning is what the brain/mind does and has to do. And so on.

Human development calls for education in some shape or form. Moreover the goal that we collectively share, of radically improving education on a very large scale, is quite breathtaking.

Can we get there from here? Whatever one may think, we have no option but to try. We can, however, take the time to breathe.

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