

Blessed Unrest: The Power of Unreasonable People to Change the World¹

Keynote address by Dr. Stephanie Pace Marshall at the 2008 NCSSSMST Professional Conference, March 2008

Thank you, Cheryl. Good evening, everyone, and Happy 20th Anniversary! It's a joy to be here.

There is an African saying, "If you want to go fast, go alone. If you want to go far, go with others"—and going far together has been the story of this Consortium for over two decades. It was my privilege to serve as our Founding President, and it is an even greater joy to see how far we have come, and to celebrate this milestone together.

Almost a year ago, I was at my writing desk trying to do what I am supposed to do there—which is write. I prepare several speeches and presentations during the year, but this time, I was writing just for me. It's my way of getting clear about my thinking, because if I can't write it—I simply don't get it!

Usually sustained thinking, punctuated by dancing to Kenny G, Josh Groban, or the Dixie Chicks, helps to lift the fog, but not this time. This time, clarity completely eluded me, and all I could do was list my myriad of questions.

The longer I sat, the longer the list became; yet the more complex, significant and interesting, my questions became, as well. Finally out of sheer frustration, I put my hand on my head and said quietly, *oh Blessed Unrest*. I didn't know then where that phrase came from and why it popped into my mind. I do now and I'll come back to it at the end of my comments. But it stopped me cold.

Blessed Unrest—the possibilities inherent in the paradoxes that define us and keep us alive, searching and committed to making our unique difference in the world, because of who we are. When I said those words—Blessed Unrest—I recognized that despite my frustration, I was actually grateful for my uncertainty; for my

insatiable curiosity, my relentless search for clarity and meaning, and my unforgiving questions that grabbed hold of me and would not let me go.

I was quite literally blessing the fact, that it is my passionate pursuit of these questions that actually keeps me awake to the work that I need to do NOW; and that keep me from living a life far too small for my imagination. As human beings, we always walk in the direction of our questions.

Several months later, I was browsing in Borders Bookstore, and I came across Paul Hawken's new book, *Blessed Unrest: How the Largest Movement in the World Came Into Being and How No One Saw It Coming*. Hawken is a world renowned environmentalist. You may be familiar with some of his previous books:

- *Natural Capitalism: Creating the Next Industrial Revolution*
- *The Ecology of Commerce: A Declaration of Sustainability*

But this book, *Blessed Unrest*, is a manifesto—a compendium and a taxonomy of global initiatives that change the face of activism for social justice and ecological health. It is a treasure, describing what Hawken calls the "movement with no name."

So fast forward. I am sitting at my desk again, trying to write my reflections for tonight and my husband brings me a *New York Times* article written by Nicholas Kristof ("The Age of Ambition," Opinion Page, 1/27/08).

Kristof is a *New York Times* journalist and someone whom I greatly admire. He has brought the voice and the face of the Darfur genocide into the public's consciousness.

Kristof was writing his article from Davos, Switzerland, and the World Economic Forum. In the article, he contrasted the power of the corporate and political elite to change the world with the power of a growing cadre of young social entrepreneurs who are doing the same thing—only very differently, not through investment philanthropy, but through community grassroots efforts and expanding social and entrepreneurial networks that are growing dynamically and organically around the world.

In the article, Kristof referenced Bill Drayton, the CEO of Ashoka—a remarkable organization that supports social entrepreneurs. He quoted Drayton as saying, “social entrepreneurs neither hand-out fish nor teach people how to fish; their aim is to revolutionize the fishing industry.”

Kristof also cited a new book written by two social entrepreneurs, John Elkington and Pamela Hartigan; it’s superb, and it is titled *The Power of Unreasonable People: How Social Entrepreneurs Create Markets That Change the World*.

So quite serendipitously between these two books, I had the context of my comments for tonight: “Blessed Unrest: The Power of Unreasonable People—you, me, our students, our staffs, and our partners—to Change the World.” Not by handing-out new programs, not by teaching kids how to master test-taking, but by revolutionizing and transforming STEM education for all our children.

Once I decided what I wanted to say, it seemed like a worthy conversation for our third decade. At the very least, it seemed like a defensible reason to hold you captive for a few minutes.

So let me set the context for my comments. If we were prospective hires at Google, we would be asked the following question: “If you could change the world using Google’s resources, what would you build?”

The question I have for us is far more modest: “If we could transform our system of STEM education P-20 using the current and potential

resources of the Consortium, what would we do?”—especially in light of the fact that the international playing field is ubiquitous, ageless, and boundary less and “Beijing, Bangalore and Bethesda are now next door neighbors” (Dr. Norm Augustine, Chairman of the Report: *Rising Above the Gathering Storm*).

So what will it take to transform STEM education in this world? What will it take to stop the erosion of our children’s minds and the quality of their critical and creative thinking? What will it take to ignite and nurture their desire to be pioneers and to advance the STEM frontier and the human condition?

We know it will take multiple systemic actions; I’ll focus on three.

1. The need to transform the way mathematics and science are taught so school science and math and real science and math, are the same and not estranged—right now, you can’t recognize real science in school.
2. The need to transform the way mathematics and science are learned so all children are immersed in the knowledge, skills and habits of mind essential for doing real science—ethical inquiry, and creative and collaborative problem-finding and solving.
3. The need to transform our nation’s system of STEM education P-20, so that innovation is ignited and sustained, and the language of mathematics and science is “spoken” and understood by all Americans.

Whether you believe we live in a “flat world” (Tom Friedman) or a “spiked world” (Fast Company), or both, we are living in a challenged world.

I once asked a conductor friend of mine why it is that more conductors come out of Finland than any other country. His answer: “Everyone in Finland speaks music!” Just imagine who we might become as a nation, if everyone could speak math and science, even a little!

So, let's begin:

First—transforming the way science is taught in school so that real science and math and school science and math are not estranged.

We now know that children come to school with intuitive scientific reasoning, innate curiosity, and the ability to discuss and generate hypotheses and do experiments (*Taking Science to School*). It is simply who we are. We are driven by perplexity, captivated by anomalies, intrigued by complexity and paradox, and drawn to the novel and the impossible—and the more impossible, the better.

But, there's a huge disconnect between our children's innate curiosity about the world and how it works, and the science they "do" in school. Howard Gardner captures this well:

"Imagine if we taught baseball the way we teach science. Until they were 12, children would read about baseball technique and occasionally hear inspirational stories of the great players. They would answer quizzes about baseball rules. Conservative coaches would argue that we ought to make children practice fundamental skills, like throwing the ball to second base 20 times in a row, followed by tagging first base 70 times. Others would reply that the economic history of the reserve clause proved that there was no such thing as 'objectively accurate' pitching. Under strict supervision, undergraduates might be allowed to reproduce famous historic baseball plays. But only in graduate school would they...actually get to play a game." Gardner concludes: "If we taught baseball this way, we might expect about the same degree of success in the Little League World Series that we currently see in science performance."

It sounds ludicrous—but for many children, this is exactly what happens. School science has become a spectator sport, not a live encounter.

And why is this? I think it's because our culture's story—our "meta narrative" about science, math and technology—what they are, who can and can't "do"

them and why they matter, is not only dysfunctional, it's dishonest. It's also dull, exclusive and arrogant.

How we currently teach and talk about science, scientists and even science teachers has created a mental model—a blueprint—that is incongruent with what science really is.

Sadly, most students experience science as:

- passive acquisition of huge amounts of prescribed and inert content and compliance with what the teacher says is true and important; the tyranny of coverage has left no time for exploration or for following questions wherever they may lead;
- devoid of joy, wonder and awe, and if you dare bring them into the classroom you do so at your peril, because "everybody knows" that emotion distorts reason;
- isolated from other disciplines and taught in silos; interdisciplinary science is often viewed as "soft";
- isolated from its social context and detached from the human experience;
- getting "right answers"; science is all about memorizing taxonomies, periodic tables and algorithms;
- not for them; they believe you're either "good at" science or you're not, and you can't do much to change it—it's in your genes and you're doomed by your DNA.

This is an insidious and tenacious story—and it is very, very difficult to change. And the consequences for individual children, our nation, and our global community are enormous. Immersion in this kind of reductive, disengaged, and sterile landscape leads to entrenched, risk averse and uncurious minds, lacking the conceptual scaffolding and maps to navigate new or novel terrain—

- unaware of the breakthroughs that happen at the edges and intersections of disciplines,
- unable to ask and explore powerful questions,
- and holding a sense of detachment from science as a way of deeply understanding the human experience, as well as their own.

The danger of school science is not only the emergence of shallow and unimaginative thinking,

but the seeding of a relativistic, superstition-prone, and situational view of science that causes us to dismiss it as too theoretical, reject its conclusions, or ignore its warnings.

As Al Gore said in his recent book, *The Assault on Reason*, “we must stop tolerating the rejection and distortion of science” (p. 10).

Steven Colbert from *Comedy Central* might describe us as suffering from scientific “truthiness”—the intuitive ability to determine truth without facts! My whole point is that in our culture and for most people, science simply doesn’t matter very much. That’s why it is not embarrassing to claim or even brag that we’re not very good at math or science. It’s simply okay—sometimes actually a badge of normalcy—and it’s especially okay if you’re female.

We know of course that real science is fundamentally different. It is about skillful and passionate inquiry; deep analysis and reflection; hypothesis generation and experimental design; relentless and uncompromising skepticism; evidence-based judgment; and the immersion in wonder and awe. School science has completely misrepresented and distorted the scientific enterprise and its contributions to world-changing.

To educate our children as pioneers in an unknown land requires their immersion in meaning, not memory; engagement, not transmission; inquiry, not compliance; exploration, not acquisition; personalization, not uniformity; interdependence, not independence; collaboration, not competition and trust, not fear.

Changing the story of this stark disjuncture between school math and science and real math and science is so fundamental to our ability to transform STEM education because, by design, the very system that is supposed to “pump” students into the STEM “pipeline,” is actually filtering them out. In fact, I am coming to the conclusion that the very metaphor itself, “pipeline,” is part of the problem because once again, it reinforces the wrong story. Pipelines imply limited access, competition, a narrow trajectory, and an inability to get out or in if you change your mind.

Internet kids don’t like or even see pipelines; they want to co-create, collaborate, and convene.

Theirs is a webbed world of global connections and social, technological and entrepreneurial networks. Pipelines are completely irrelevant to them; they slow things down, and they get in the way. Internet kids not only want to change the rules, they want to change the game and pipelines don’t lend themselves to game changing; all you can do is “go with the flow.”

We clearly need a new metaphor. We need to think of talent magnets, sandboxes, arboretums, or networks, but not pipelines.

There is an enormous disconnect between our nation’s demand and expectations for innovation, and the demands and expectations of the current story, map and landscape of school science and mathematics. We have a seriously flawed design, and we are getting precisely what we designed for. School science completely misrepresents and distorts the scientific enterprise and its contributions to world-changing. And this is where we come in as a Consortium, we can tell the real story of science—loud and clear—because if we don’t, we won’t be able change the system. Even in our data-driven culture, narrative trumps data every time.

Let’s move on to the second action—transforming the way math and science are learned so all children are immersed in the knowledge, skills, and habits of mind essential for doing real science. What will it take?

I believe it will take a new map—a new design, and as STEM leaders, we have significant experience with what it needs to be:

- (1) Concept-centered, experiential and integrative curriculum, so children understand fundamental science concepts, deep organizing principles and linkages, and how science builds knowledge and enriches the human experience;
- (2) Inquiry-based, problem-centered, and technology embedded instruction, so children engage in the process of doing science, not as an experimental “recipe,” but as an unfolding inquiry because real world problems are messy,

complex, and tangled and science knowledge is tentative;

- (3) Extensive practice and immersion in self-determined and self-directed investigation and research with mentors and peer collaborative teams, in real and virtual laboratories and incubators, and in the natural world so that students are immersed in the joy of doing real science;
- (4) Authentic, on-going, multi-dimensional, and performance-based assessment; so children are invited to creativity demonstrate evidence of their understanding, in multiple and novel ways.

The new map—new design—must enable children to engage in authentic, scientific thinking. Rewarding the illusion of learning at the expense of deep and creative thinking endangers our children, our nation, and our future. When information acquisition masquerades as learning and high stakes test scores masquerade as understanding, our children's motivation and ability to think critically, creatively, systemically, and long-term is diminished. If we did nothing else to erode the minds of our children, this would be enough. As a Consortium and as a nation, we have what we need to transform STEM education. Now it is a matter of will—and who better positioned than us to become the unreasonable catalysts and voices.

This brings me to the last dimension: How we might transform STEM education P-20 and create a dynamic system for STEM innovation so that:

1. the real story of science and mathematics is taught and learned;
2. advances in neuroscience, cognition and learning technologies drive system design;
3. new structures and rules of time, place, grade level, age, and curriculum are turned upside down;
4. imagination and inquiry are ignited and nurtured;
5. innovation is scaled and sustained;
6. the language of math and science is spoken and understood; and
7. our children and our system can access the collective intelligence of the emerging "global mind."

Before I talk about what we can do as a nation, I want to focus first on us—our consortium. In

2006, Governor Napolitano, then President of the National Governors Association, recommended a mathematics and science academy in every state, so did the report, *Rising Above the Gathering Storm*. Now this recommendation is codified in the America Competes Act.

We have been told that our paper, "Addressing the STEM Challenge by Expanding Specialized Mathematics and Science High Schools," influenced this legislation. So we've made a powerful contribution and our forthcoming book, *Schools Like Ours*, can make an even greater one. But now since our numbers will likely increase, we need to move from an alliance, to a real and virtual global STEM Innovation and Talent Development network that co-creates, generates, shares, and translates our unique intellectual and creative capital.

So what might we do if we saw ourselves in this way—as a dynamic, global STEM innovation and talent development network, with each of our institutions serving as a hub in a regional network for innovation and inquiry? We have the social networking tools and the next generation learning technology to do it and some of these technologies have been invented by our alumni!

The "final answers" will come from our collective and unreasonable imagination, but let me offer some possibilities and the roots are already being watered by our Board of Directors: We model ourselves after the Clinton Global Initiative University (CGIU) and create The Consortium Academy. Like CGIU, it would be an extension of the Consortium that reaches across all our campuses to engage our students and our institutions in work such as:

- identifying and solving some tenacious, complex and "wicked" (John Kao, *Innovation Nation*) local, national, and global problems;
- collaboratively designing and teaching courses and seminars online and enabling our students and staff to access (and even earn credit for) the full spectrum of the Consortium's offerings and programs; an NCSSSMST online;
- collaboratively designing, conducting and sharing research on the impact of technologies like

Second Life, on cognitive development. We could also hold a conference on Second Life. I'd love to see what our avatar would like like!

- generating research questions about teaching and learning science and mathematics in light of breakthroughs in neuroscience—especially neuroplasticity and epigenetics; putting them out into the world and inviting the emergence of a community of practice;
- jointly creating programmatic prototypes to experiment with new learning, teaching and assessment strategies;
- developing entrepreneurial initiatives and seeking angel investors; IMSA alum are already doing this for one another. We could have our own Consortium Innovation Investment Network;
- creating “games for good,” where to win means you have advanced the human condition in some way;
- exchanging students and staff—including our global partners and “sister” institutions—through research, innovation, and design sabbaticals, and creating a Consortium Fellows Program;
- translating and transferring knowledge throughout our global network using open source technology and the creation of a global data warehouse.

NCSSSMST as a real and virtual global STEM Innovation Network would be a dynamic force for transformation.

And finally—let's look at our nation. What might our country do to transform our system of P-20 science and mathematics education. A year ago I was invited by the National Science Board to give testimony to their Commission on 21st Century Education in STEM. I recommended that they consider the chartering, by Congress, of a National Institute and Incubator for STEM Teaching and Learning Innovation. They were intrigued by the idea.

I explained that this Institute would not serve in a regulatory capacity. Rather, it would combine the entrepreneurial culture and the best designs of institutes and companies like the Santa Fe Institute, the MIT Multi-Media Lab, the Beckman Institute at the University of Illinois and the Biodesign Institute at Arizona State and companies like Google, IDEO, and CISCO—just to name a few.

Its purposes would be to ignite and nurture innovation and to generate, share and integrate the nation's vast scientific, creative, educational and technological resources to transform our system of STEM education. It would:

1. stimulate, connect and create synergies among multiple stakeholders, initiatives, research programs, and networks;
2. focus research on the implications of new learnings in neuroscience and cognition, and the effects of multiverse environments, such as Second Life on STEM education;
3. ignite and support innovation through multidisciplinary, transdisciplinary and interdisciplinary curriculum, instruction, assessment and professional development design and scaling;
4. accelerate STEM transformation through the prototyping and incubation of promising programs, practices at the state, regional, and local levels;
5. and ensure global national and state collaboration, integration and evaluation.

The Institute would also be a place where multidisciplinary stakeholder teams from around the country and the world would gather to develop designs and prototypes for new processes, structures, and programs in STEM—both real and virtual. The National Institute and Incubator would be part think-tank, part research and development laboratory, part skunk works, and part design center—the hub of a vast networked system of innovation linked to federal education and science laboratories, universities, museums, community-based science programs and innovative companies. It's just an idea—but ideas start conversations and conversations can start movements which harness the power of unreasonable people to change the world.

I said when I began that I would come back to the origins of the phrase, “Blessed Unrest.” It came from a comment that the legendary dancer and choreographer, Martha Graham, made to her friend, Agnes DeMille, another choreographer and dancer when they were in a restaurant in New York in 1943.

There are two versions of what prompted Martha

Graham to say what she did. One is that DeMille was very troubled by the eroding quality of her musical, "Rodeo," after cast turnover. The other was that DeMille was mystified that her musical, "Oklahoma," had been so successful when she felt that it was not as good as others the critics had neglected. Regardless of the stimulus, Martha Graham's words are not disputed.

Here is what she said and I asked you to think about yourself and our Consortium as I read this:

"There is a vitality, a life force, an energy, a quickening, that is translated through you into action, and because there is only one of you in all time, this expression is unique. And if you block it, it will never exist through any other medium and will be lost. The world will not have it. It is not your business to determine how good it is nor how valuable nor how it compares with other expressions. It is your business to keep the channel open... You have to keep open and aware to the urges that motivate you. As for you, Agnes, you have a peculiar and unusual gift, and you have so far used about 1/3 of your talent... No artist is pleased... [There is] no satisfaction whatever at any time. There is only a queer divine dissatisfaction, a Blessed Unrest that keeps us marching and makes us more alive than the others" (Hawken. *Blessed Unrest*: 308).

When I read this quotation in Hawken's book, I had a flashback and remembered reading it many years ago—obviously the phrase "Blessed Unrest" had remained with me—buried until now.

So, now at this moment—as individuals likely using only a third of our talents and as a consortium likely doing the same thing, what is the work we can now do together with the collective resources we have that beg to be shared and connected? What is the source of our Blessed Unrest that will give us the courage to become unreasonable advocates for our children and for STEM transformation?

My answer? It's as simple as A-B-C-D!

A: We claim our authority and name and author a new story of school science and math, and lead the conversation about innovation and talent development in STEM.

B: We rigorously define the distinctiveness and integrity of the Consortium's brand so it is crystal clear what putting our name on something means.

C: We create, collaborate, convene and connect continuously so that we grow our collective intelligence.

D: We dare to embrace our unique and remarkable talents and potentials

We don't add value when we do what everybody else can do. We add value when we do what only we can do. So, A-B-C-D are the roots of The Blessed Unrest that can, in Martha Graham's words, "keep us marching and make us more alive than all the others.

Well... I've come to the end of my talk. I didn't intend to leave us with answers. I don't have them; they must come from our collective genius. I did intend to leave us with questions and invitations, full of possibilities worthy of who we are and who we might become in our third decade—NCSSMST 3.0—sure to keep us awake and alive and, I hope, in a state of perpetual and heightened Blessed Unrest. Happy Anniversary!

NOTE: ¹The phrase "Blessed Unrest" came from a quotation by Martha Graham to Agnes deMille and is the title of Paul Hawken's new book, *Blessed Unrest: How the Largest Movement in the World Came into Being and Why No One Saw It Coming*. The phrase "the power of unreasonable people to change the world" came from John Elkington's and Pamela Hartigan's book: *The Power of Unreasonable People: How Social Entrepreneurs Create Markets That Change the World*.