PANEL PROPOSAL (SEE ALSO PAPER ABSTRACTS)

Submitted by

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for

Creativity: Worlds in the Making

A National Symposium at Wake Forest University, March 18-20, 2009

PANEL TITLE: Trans-Disciplinary Creativity and Its Educational Tools – Research, Practice, Applications and Minds-On Exercises

PANEL DESCRIPTION:

We propose a trans-disciplinary session focused on intersecting approaches to thinking about and teaching creativity. We believe the strength of our proposed panel lies in the multiple disciplines and perspectives we each bring to a shared focus and in our personal as well as professional commitments to creative experience. Depending on the time allotted to us, in addition to our papers each of us can devote some or even a substantial portion of our presentation to minds-on activities involving audience participation. In order to do this, we will require an LCD projector and computer, at a minimum. We would prefer to have a lecture room or class room situation in which writing/drawing surfaces are available for each member of the audience. We request as much time as the organizing committee will permit us, as the more time we have, the more participatory and integrative activities we can provide.

Papers

TITLE: Beyond Liberal Arts to Integrated Curricula, Or Why Artists Need To Be Scientists and Scientists, Artists

AUTHOR: Robert Root-Bernstein, Ph.D.

ABSTRACT: Many scholars believe that Renaissance people are no longer possible. However, the definition of creativity – which is the useful integration of apparently dissimilar things – requires creators to be people who are not only trained in disparate disciplines, but who can find fruitful links between them. Recent studies of Nobel Prize winners (sciences, literature, economics and peace) demonstrate that the highest achievers in every discipline are far more likely to be polymathic both in their training and output than are average practitioners in these fields or members of the general public. These statistical data are confirmed by interviews with and autobiographical descriptions by creative people about the derivations of their insights and inventions.

I will focus particularly on scientists and inventors who attribute their insights to their artistic skills and knowledge, and artists who attribute their insights to their studies and understanding of science and technology. Examples of world-class artistic scientists will include Harvard's Eric Heller, FERMILAB's Robert R. Wilson, and Nobel laureates Roald Hoffmann, Harold Kroto and Roger Guillemin. Examples of world-class scientific artists will include composers Lajaren Hiller and Iannes Xenakis and artists Alexander Calder, George Rickey, Kenneth Snelson and Todd Siler. A dozen educational strategies for fostering the kinds of trans-disciplinary creativity displayed by these exemplars will be presented: e.g., focusing education on creative processes rather than products; emulating the trans-disciplinary role models to be found in every field; introducing a common set of "tools for thinking" embodying the skills required for creative thinking; finding a common, trans-disciplinary language for describing creativity as it is manifested in every discipline; making the arts (in their broadest definition) a part of education at every educational level and in every discipline; etc. If time permits, the audience will get "minds-on" practice with some of the "tools for thinking".

TITLE: **From Childhood Play to Adult Innovation: Worldplay as Creative Strategy**

AUTHOR: Michele Root-Bernstein, Ph.D.

ABSTRACT: In keeping with the overarching theme of this conference, my paper will focus on the lifelong creative implications of a certain kind of play, the invention of imaginary worlds.

Worldplay has its roots in spontaneous elaboration of normal developmental play in childhood. Typically beginning around the age of 9, around 1 in 30 children will make up constructed languages, imaginary places and people, pretend histories and alternative institutions. Over extended periods of time they draw maps and pictures, write stories, or otherwise model their make-believe in complex and consistent. Because worldplay marries fantasy to plausibility, it can serve as a "learning laboratory" for the acquisition of real-world knowledge and the exercise of creative potential.

Furthermore, worldplay in childhood may predict mature creativity. A pilot study of MacArthur Fellows suggests a strong correlation between childhood worldplay and adult creative achievement in the arts, sciences and humanities. More to the point, adult worldplay – understood by MacArthur Fellows and others as the invention of plausible, probable or possible worlds – proves a viable strategy for the development of novel and effective knowledge within or between disciplines. In some cases worldplay paves the way for trans-disciplinary synthesis and creative polymathy.

In illustration, I will draw on query data and interviews with MacArthur Fellows and on case studies of historical and contemporary creators, such as the writer Charlotte Bronte, philologist-novelist J.R.R. Tolkien, artist-writer Leo Lionni, visual artist-sculptor Claes Oldenburg, literary historian Laura Otis, physicist-novelist Gregory Benford, zoologist-painter-writer Desmond Morris and artist-inventor Todd Siler. For these individuals (as for many more) worldplay harnesses the fanciful imagination to the rigorous and rational demands of disciplinary speculation, discovery and innovation.

In conclusion, I will briefly explore the curricular adaptation of the worldplay impulse as a means of stimulating trans-disciplinary imagination and creativity from grade school through college.

ABSTRACT TITLE: Crossing Boundaries: Teaching Teachers to Think Creatively

Punya Mishra, Ph.D. & Michael DeSchryver

ABSTRACT: The necessity for creativity in our society, whether as an essential literacy, an interdisciplinary process, a catalyst for social change, or a key to successful leadership and collaboration, is well documented. We submit that in order to ensure that 21st citizens demonstrate the "new ethos of creativity," we must begin to better facilitate and model creative thinking in our schools.

Establishing a culture of creativity in schools is no small task. The essential goal is to foster student creativity within and at the intersection of the different domains of knowledge. However, given the teacher's role as primary mediator between subject matter and student understanding, we must first address the need to enhance creativity in both pre-service and in-service teachers. Unfortunately, at present, the most common trajectories of teacher training do little to achieve this.

In this presentation Mishra and DeSchryver describe their programmatic efforts at developing teacher creativity. They argue that creativity should be taught in a way that transcends disciplinary boundaries and also results from an amalgam of different thinking skills. Then, we explain the evolution of our inter-disciplinary courses for practicing teachers (taught both face to face and online) that emphasize the development of creative ways of thinking and being. Through readings, activities, and design-based assignments, these courses encourage students to appreciate the creative process, creative products, and the critical role of aesthetics in educational settings.

Of particular interest is how newer digital technologies can benefit the development of creative strategies. By this we mean that technology both facilitates and requires creativity. Using the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra and Koehler, 2006), we demonstrate how teachers begin to understand that teaching 21st century citizens must incorporate technology, and that in doing so, creative thinking becomes an essential characteristic of successful technology integration.

TITLE: A Wake-Up Call for Cultivating a World of Creative-Critical Thinkers, Problem Solvers & Innovators

AUTHOR: Todd Siler, Ph.D.

ABSTRACT: My paper will present some proven practices for tapping people's creativity and applied knowledge in showing solutions to problems we all face. Building on my exploratory work that integrates the arts and sciences, I will show a combination of arts-based and science-based, experiential learning tools that enable learners of all ages to discover and

express their creativity in personally meaningful, relevant and useful ways. This work will be connected to the innovative practices of the distinguished physiologist, science historian and authors Drs. Robert and Michele Root-Bernstein whose book, *Sparks of Genius: The 13 Thinking Tools of the World's Most Creative People*, brilliantly illuminates the process of inspiring and catalyzing breakthroughs and innovative thinking. Moreover, it tracks with Michele Root-Bernstein's insights into the creation of imaginary worlds, or "worldplay," which prepares the mind for discovery through playful, yet purposeful, acts of creative inquiry propelled by pure wonder.

My presentation will include a demonstration of a new educational software tool, which is currently being used to create and share multi-dimensional Curricular Models in grades K-12 and higher education, and across curriculum. The website that accompanies the software serves as a fun, safe place where individuals or groups can upload their symbolic models or "Worldz" and share them with others. The 3D environment allows users to explore a mosaic of *Worldz*, freely building on or re-purposing them. The symbolic models serve as a common language for expressing one's thoughts, feelings, ideas, and knowledge.

This versatile tool is an outgrowth of a hands-on learning process, called "metaphorming," I created nearly thirty years ago to stimulate self-learning, invention and innovative thinking (http://www.newhorizons.org/lifelong/workplace/siler.htm). A selection of case studies will exemplify how metaphorming cultivates quintessential learning skills that encompass creativity, critical thinking, problem posing and problem solving—all of which fuel the engine of innovation.

Authors

Robert Root-Bernstein (Dept. of Physiology, Michigan State University), is an artistically-inclined biologist, historian of science, and MacArthur Fellow. He will describe studies demonstrating that the most creative people in every discipline are polymaths and he will provide "tools for thinking" and educational strategies for creating integrated curricula to foster such creative types. He is co-author with Michele Root-Bernstein of *Sparks of Genius* (Houghton Mifflin, 1999), which was Book of the Year in Korea last year.

Michele Root-Bernstein (Dept. of Theater and Dance, Michigan State University), an award-winning historian, poet, and writer will describe the phenomenon of "worldplay" – the elaboration of imaginary places, peoples, and cultures – as a trans-disciplinary phenomenon that correlates adolescent creativity with adult creativity, and she will describe how it can be introduced as a classroom strategy.

Punya Mishra (Dept. of Education, Michigan State University) Punya Mishra is (Depart of Educational Psychology & Educational Technology, College of Education of Education) is an Educational Psychologist with degrees in Electrical Engineering and Visual Communication. He has published widely in the area of teacher education and technology integration. He is also an award-winning teacher, an accomplished visual artist and poet.

Michael DeSchryver is currently a PhD student in the same program. In his research, he explores how the Web facilitates creativity and deep learning. In this presentation Punya & Michael will describe their program for teaching creativity to prospective teachers, in online and face to face contexts.

Todd Siler (Founder/President, Think Like a Genius, LLC, & Psi Phi Technology Corp.), an internationally recognized artist, inventor, psychologist, and author (*Breaking the Mind Barrier* and *Think Like a Genius*), is also a developer of educational software. He will describe his process of "metaphorming" as a method for stimulating trans-disciplinary insights, and demonstrate the latest version of his multi-modal, creativity-enabling software.