(In)Disciplined Ways of Learning

Punya Mishra
(punya@msu.edu | punyamishra.com)
Michigan State University

Creativity? Why? And What is it?

Creativity is of increasing importance to educators, both for their professional success and that of their students, particularly given the complex, rapidly changing world we live in, where our very survival and personal identity is tied up in improvising knowledgeable answers to largely unanticipated problems. It has been argued that the solution to these concerns is an increased emphasis on creativity. Defining creativity is not easy.

Defining Creativity: Too often creativity is regarded as being something new, irrespective of use. Novelty needs to be joined to *purpose* – a creative solution, product, or artifact is both novel and useful. Creative solutions often go beyond mere novelty and functionality to include a strong aesthetic quality. Creative products and solutions are deeply bound to the context within which they occur; they are integrated, organic and whole. Thus creative solutions are *novel*, *effective* and *whole*. Taking each of these worlds in turn we get a range of meanings, a constellation of words that illuminate what a creative solution is:

Novel	Fresh, unusual, unique, surprising, startling, astonishing, astounding, germinal, trendsetting, radical, revolutionary, influential, pioneering
Effective	Valuable, important, significant, essential, necessary, logical, sensible, relevant, appropriate, adequate, functional, operable, useful, user-friendly
Whole	Organic, ordered, arranged, organized, formed, complete, elegant, graceful, charming, attractive, refined, complex, intricate, ornate, interesting, understandable, meaningful, clear, self-explanatory, well crafted, skillful, well made, meticulous

## *Trans-disciplinary Creativity & (In)Disciplined Learning*

Trans-disciplinary approaches eschew traditional distinctions between art and science, applied and pure knowledge. This approach seeks to find commonalities between strategies and habits of thought used by creative individuals in any discipline. Our work in this area builds on prior conceptual work done in this area by Root-Bernstein (1996, 1999), who argue that creative scientists and artists generally use a key set of cognitive skills that cut across disciplinary boundaries. As Root-Bernstein (1999) note that at the level of the creative process:

> *… scientists, artists, mathematicians, composers, writers, and sculptors use…what we call "tools for thinking,"*
> *including emotional feelings, visual images, bodily sensations, reproducible patterns, and analogies. And all*
> *imaginative thinkers learn to translate ideas generated by these subjective thinking tools into public languages to*
> *express their insights, which can then give rise to new ideas in others' minds*

Based on their work we propose **seven key trans-disciplinary tools (or cognitive skills)**, which encapsulate how creative minds think effectively across a range of domains[1]. These seven cognitive tools are: *perceiving, patterning, abstracting, embodied thinking, modeling, play, and synthesizing.*

Creativity requires both a deep disciplinary knowledge and also the ability to break disciplinary boundaries and transfer ideas across other subject matters. The idea of (in)disciplined learning suggests that even though creativity happens *in* a discipline or context; we have to realize that it is also *"indisciplined"* i.e. it cuts across disciplinary limits to emphasize divergent thinking and imagination.

Trans-disciplinary Creativity: Some key resources
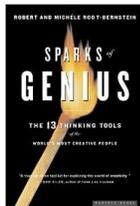
Sparks of Genius
By Robert & Michele
Root-Bernstein

Sparks of Creativity: A Multi-Media
Companion (by MSU EdTech)
http://deep-play.com/sparks/

Explore | Create | Share:
Creative Play with Ed Tech
http://deep-play.com/explorecreateshare/

<u>*Some key readings*</u>

Mishra, P., & Koehler, M. J. (2009). Too Cool for School? No Way! *Learning & Leading with Technology*, (36)7. 14-18.

Mishra, P., Koehler, M. J., & Kereluik, K. (2009). The song remains the same: Looking back to the future of educational technology. *TechTrends*, 53(5), 48-53.

Mishra, P., Koehler, M. J., & Henriksen, D. (2011). The seven trans-disciplinary habits of mind: Extending the TPACK framework towards 21st century learning. *Educational Technology 51*(2), 22-28.

Mishra, P., & The Deep-Play Research Group (2012). Rethinking Technology & Creativity in the 21st Century: Crayons are the Future. *TechTrends, 56(*5) 13-16.

Mishra, P., Henriksen, D. & the Deep-Play Research Group (2012). On Being *In*-Disciplined. *TechTrends. 56*(6), 18-21.

Mishra, P., Fahnoe, C., Henriksen, D. & the Deep-Play Research Group (2013). Creativity, self-directed learning and technology rich environments. *TechTrends. 57*(1), 10-13.

Mishra, P., Terry, C., Henriksen, D., & the Deep-Play Research Group (2013). Square Peg Round Hole, Good Engineering. 57(2), 10-14.

Mishra, P., Yadav, A. & the Deep-Play Research Group (2013). Of art and algorithms. *Tech Trends. 57*(3), 10-14.

Henriksen, D., & Mishra, P. (2013). Learning from creative teachers. *Educational Leadership. 70*(5). Retrieved from http://www.ascd.org/publications/educational-leadership/feb13/vol70/num05/Learning-from-Creative-Teachers.aspx