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STEAM...Now!

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Abstract

With America slowly awakening to the need to turn out creative and innovative workers who can join the 21st century (its already 2012) workplace -- because they have the new thinking skills --we have to change the current emphasis on STEM, for Science, Technology, Engineering and Math to STEAM, by insuring that the whole brain is nurtured through the arts: thus STEAM.

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John M. Eger, J.D. is the Van Deerlin Chair of Communications and Director of the Creative Economy Initiative at San Diego State University (SDSU) and writes about creativity and innovation, education and economic development. Earlier, was an executive of CBS Inc. Professor Eger was Advisor to President Richard Nixon and President Gerald Ford and Director of the White House Office of Telecommunications Policy (OTP). He served on the Presidential Initiative on Privacy, the Cabinet Committee on Cable Television, and the Ad-hoc Committee on Regulatory Forum. He also serves as the founding President of the World Foundation for Smart Communities, a non-profit educational effort designed to help local communities connect to the global knowledge based economy.

Keywords

STEM, STEAM, 21st Century Skills, Education, Policy, Design, Creative Economy

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STEAM...Now!

By John M. Eger

With America slowly awakening to the need to turn out creative and innovative workers who can join the 21st century (its already 2012) workplace -- because they have the new thinking skills --we have to change the current emphasis on STEM, for Science, Technology, Engineering and Math to STEAM, by insuring that the whole brain is nurtured through the arts: thus STEAM.

STEAM- including the arts and art integration-has become the threshold issue in this effort to reinvent our schools, our communities and our nation.

To accomplish our goals, however, we desperately need to be willing to change the paradigm, reinvent our schools-the very concept of education- and meet the challenges of a global economy. During the Clinton presidency democratic strategist James Carville, was fond of saying, "*it's the economy, stupid*" (Eger, 2010) much the same could be said today. The stimulus and all the federal policies in the world will not help if all we do is prop up the old economy. It is rather the new economy, the creative and innovative economy, begging for attention.

And it is our educational system where we must start.

John Howkins, author of 'The Creative Economy' (2007), says that anyone with a good idea can make money. He defines creative industries as occupations like advertising, architecture, graphic design, filmmaking, authors, painters and the like which you can count in the few millions.

Richard Florida, author of 'The Rise of the Creative Class' (2002), claims thirty-eight million people as among the new creative class. In what is clearly a more expansive definition of

the term "creative," Florida (2002) includes professionals in business and finance, law, healthcare and related fields *"these people engage in complex problem solving that involves a great deal of independent judgment and requires high levels of education or human capital... all are members of the creative class"* (Florida, p. 8).

However, it does not matter in the short term what we call this new economy or how we measure it. Both are right... a new economy is emerging and it is huge. It is an economy requiring creativity, imagination and innovation. It is an economy that is global, technology driven and knowledge based. There is a trend here, like a tsunami really, shaping our world and our workforce as never before.

Daniel Bell, author and Harvard sociologist, in his 1973 book 'The Coming Post-Industrial Society', looked backward in time and noted how the invention of the cotton gin by Eli Whitney transformed the farm, forced people into the cities and created what we now call the Industrial Revolution. Computers and telecommunications, like the cotton gin of an earlier era, were bringing about yet another shift in the economy that he called the post-industrial society. Bell's treatise was the first significant effort to identify structural changes in society leading to the Information Age.

Yet here we are struggling to define yet another shift in the basic structure of the world's economy. We know it's global, and Thomas Friedman of the New York Times has told us it's "flat." It is also technologically driven by the pervasive spread of the Internet. But it is creativity - simply defined as "the quality or ability to create or invent something original" - that best defines the characteristic most of us need to succeed in the new economy.

What is important is that we-as President Obama has said-recognize that a whole new economy and society is emerging and that, as a consequence, it is of vital importance that we

reinvent our communities, our schools, our businesses, our government to meet the challenges such major structural shifts are compelling. It may not happen at the Federal level, it probably will not because of the gridlock in Washington, DC. But it can and should happen in the state and local and regional communities across America.

Every man, woman and child needs to know and understand that the tectonic plates of the world's economy have shifted. The task of recreating any city-any community- housing, transportation, roads and bridges, clean water electricity, schools, is enormous. The task of creating a knowledge city, a creative and innovative community, is equally complex.

Yet cities must prepare their citizens to take ownership of their communities, build the broadband communications structures the workplace needs, and educate the next generation of leaders and workers to meet the new global challenges of what just has now been termed the new economy, the creative and innovative economy.

These are the ingredients so essential to developing and attracting the type of bright and creative people that generate new patents and inventions, innovative world-class products and services and the finance and marketing plans to support them. If we don't first have smart and creative people however, we cannot have creative workplaces or communities.

In just the last few years STEAM camps and STEAM academies are popping up as educators and parents are learning the importance of nurturing both sides of the brain, and creating the new thinking skills our young people will need in the new economy. Art, in all its forms, does this. Hence, the STEAM camps with the emphasis on the arts and art related businesses such as digital media, biomedicine, biotechnology, energy and clean technologies.

The National Science Foundation (NSF) and the National Endowment for the Arts (NEA) have recently entered the educational arena too.

They don't call it STEAM but the NSF for example, funded three conferences last year- in Washington, D.C., Chicago, Illinois and San Diego, California - to look at what business, education, and communities across the United States were doing to merge the "two cultures" of art and science. NSF, in its latest announcement in September to put over \$2.6 million dollars into three incubators-in San Diego, Chicago and Worcester, Mass., hopes that a new model for education will become apparent over the next few years. Specifically they state:

“The goal of the project's development activities is to experiment with a variety of "innovation incubator" models in cities around the country (and to use) creative learning methodologies ... to generate creative ideas, ideas for transforming one STEM idea to others, drawing on visual and graphical ideas, improvisation, narrative writing and the process of using innovative visual displays of information for creating visual roadmaps” (Balboa Cultural Partnership, 2012).

The NEA announced its grant agenda in art and science earlier in the year and called for proposals that *“demonstrate how both subjects can be woven together in an art work, or play, demonstration or lab experiment or even an educational effort”* (NEA, n.d.). Bill O'Brian, senior adviser for Innovation programs at the NEA said that "creativity and innovation" clearly support U.S. economic interests and he expected this effort to continue well beyond the current request for applications. He also noted that the government community of artists and scientists are very much in agreement that these are the kinds of things they wish to fund.

Like the NSF, he stopped short of endorsing STEAM per se - maybe too political a decision - but he seemed enthusiastic about the idea of funding art and science projects.

And the states are adopting so called Creativity Indexes to measure creativity in public schools statewide.

Massachusetts was the first state to try to do so. Similar ideas for such an index are being discussed legislatures in Oklahoma, Maine, Connecticut, New York, Rhode Island, Colorado, California and Wisconsin and Nebraska is getting itself organized, according to Creative Challenge Index which monitors creativity discussions worldwide. The group notes that Seoul, Korea, and Alberta and Edmonton in Canada - and probably other cities and nations around the world - are following these efforts closely.

All of these efforts represent an auspicious start to reinventing K-12 education. And they represent new thinking about the arts and what is called "arts integration." It's not the most widely understood concept, but it is simply about interdisciplinary education and using the tools of the arts.

Two years ago U.S. Secretary of Education Arne Duncan (2010) stated that "*the arts can no longer be treated as a frill ... Arts education is essential to stimulating the creativity and innovation that will prove critical for young Americans competing in a global economy*" (p.1.). Duncan also said that the Education Department is conducting the first large-scale survey of school principals, music teachers, and visual arts specialists in 10 years. But clearly more needs to be done.

This is a "national emergency" states Harvey White, co-founder and former President of Qualcomm (White, 2010). We must see the connection between the demand for creativity, its role in fostering innovation, and the survival of America in the new knowledge economy, and now.

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