

EDUCATION TRENDS

STEM to STEAM: Art in K-12 Is Key to Building a Strong Economy

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Photo Credit: RISD Museum
<http://www.flickr.com/photos/83627>

As the nation embarks on a new school year, education leaders from President Obama on down are facing a renewed commitment to the STEM subjects – Science, Technology, Engineering and Mathematics – as a driver of innovation. And what better advertisement of the power of STEM education than the recent landing of the Mars Rover? Like the original Apollo missions to the Moon, they powerfully reveal the magic of science and engineering. Just this summer, the Obama administration announced a laudable new "teacher corps"

(<http://www.whitehouse.gov/blog/2012/07/18/president-obama-announces-new-plan-create-stem-master-teaching-corps>) dedicated to excellence in the STEM

subjects, and as far and wide as Estonia, a new policy is spurring debate

(<http://www.wired.com/wiredenterprise/2012/09/estonia-reprograms-first-graders-as-web-coders>) about the value of teaching programming to elementary school students.

The White House reminds us that "a world-class STEM workforce is essential to virtually every goal we have as a nation – whether it's broadly shared economic prosperity, international competitiveness, a strong national defense, a clean energy future, and longer, healthier lives for all Americans." Indeed, we know that the challenges the next generation faces will demand creative solutions, but I would argue that STEM alone will *not* get us there. Innovation happens when convergent thinkers, those who march straight ahead toward their goal, combine forces with divergent thinkers – those who professionally wander, who are comfortable being uncomfortable, and who look for what is real.

Innovation, Ingenuity and . . . Elmo?

I applaud the growing and necessary focus on spurring innovation worldwide, and as a lifelong STEM student myself, I've seen firsthand the innovation that STEM education can produce. But I've also witnessed STEM's limits, and there is a rising new voice out there that has an additional viewpoint on how to keep America competitive – at an even higher level. For the past several years, I have been arguing that *we need to add the "A" for Art to turn STEM to STEAM*. So I was delighted to note how this year, the upcoming 43rd season of *Sesame Street* is being brought to viewers by the letters S-T-E-A-M (<http://www.sesameworkshop.org/season43/about-the-show/curriculum/>). Only a year ago, Elmo was interviewed on CNN about the importance of S-T-E-M. What a testament to the power of creativity!

Creativity and ingenuity have always been central to the American story of progress. After two decades as a student and faculty member at MIT, my experience as the President of the Rhode Island School of Design (RISD) has reawakened me to the world of physical creation. RISD is the ultimate culture of makers. There is no greater integrity, no greater goal achieved, than an idea articulately expressed through something made with your hands. We call this constant dialogue between eye, mind, and hand "critical thinking – critical making." It's an education in getting your hands dirty, in understanding why you made what you made, and owning the impact of that work in the world. It's what artists and designers do.

What does it mean to turn STEM to STEAM? The problem-solving, the fearlessness, and the critical thinking and making skills that I see every day in the RISD studios are the same skills that will keep our country innovating, and their development needs to start in the K-12 schools. Design creates the innovative products and solutions that will propel our economy forward, and artists ask the deep questions about humanity that reveal which way forward actually is. Sustaining arts education in its own right remains critically important. *But equally important is taking a page from schools that have been successful at integrating the arts into STEM curriculum.*

Examples of both (<http://www.edutopia.org/stw-arts-integration>) abound -- from the Blue School (<http://blueschool.org/>) in New York City, started by the founders of the Blue Man Group, to the Drew Charter School (<http://www.drewcharterschool.org/>) in Atlanta, whose curriculum is premised on STEAM. And we've just launched a website at RISD (<http://stemtosteam.org/>) that shares the case studies we've collected on STEAM.

Art and Science Reunite

Whether today's students go on to be artists, doctors or politicians, we know that the challenges their generation faces will demand creative solutions. We should fully expect that, in the coming decades, many of our best leaders will come from art and design backgrounds.

STEAM is gaining traction as a movement in government and research circles as well. House Resolution 319, introduced by Representative Jim Langevin (D-RI), and still in play, "expresses the sense of the House of Representatives that adding art and design into federal programs that target Science, Technology, Engineering and Math (STEM) fields, encourages innovation and economic growth in the United States."

Government agencies are also acknowledging that art and science -- once inextricably linked, both dedicated to finding truth and beauty -- are better together than apart. The National Science Foundation has funded a series of three workshops, one of which took place here at RISD, to explore themes around STEM to STEAM. From the other side of the spectrum, the National Endowment for the Arts has made a major push around what they call Artscience initiatives, including hosting an event this June about the intersection of art, science and technology.

With global competition rising, America is at a critical juncture in defining its economic future. I believe that art and design are poised to transform our economy in the 21st century in the same way that science and technology did in the last century, and the STEAM movement is an opportunity for America to sustain its role as innovator of the world.

Join us at <http://stemtosteam.org/> (<http://stemtosteam.org/>).

Supporting Links

- www.stemtosteam.org (<http://www.stemtosteam.org>)

- ArtsUSA: Sesame Street Moves Full STEAM Ahead (http://blog.artsusa.org/2012/08/27/sesame-street-moves-full-steam-ahead/?utm_source=rss&utm_medium=rss&utm_campaign=sesame-street-moves-full-steam-ahead)
- Examiner: Sesame Street Previews 43rd Season (<http://www.examiner.com/article/sesame-street-previews-43rd-season-elmo-celebrities-and-spoofs>)
- ArtInfo: Can the U.S.'s Science Education Initiative Succeed Without the Arts? A Growing Chorus Says No (<http://artinfo.com/news/story/820916/can-the-uss-science-education-initiative-succeed-without-the-arts-a-growing-chorus-says-no>)
- Yahoo! News via Scientific American: From STEM to STEAM: Science and Art Go Hand-In Hand (<http://news.yahoo.com/stem-steam-science-art-hand-hand-115600026.html>)
- New Scientist interview with RISD President John Maeda at TED Global (<http://www.newscientist.com/blogs/culturelab/2012/08/john-maeda-steam.html>)
- Education Week: STEAM: Experts Make Case for Adding Arts to STEM (http://www.edweek.org/ew/articles/2011/12/01/13steam_ep.h31.html)
- Blue School (<http://blueschool.org/>) in New York City, started by the founders of the Blue Man Group
- Drew Charter School (<http://www.drewcharterschool.org/>) in Atlanta, whose curriculum is premised on STEAM
- RISD Museum Education (<http://www.risdmuseum.org/education.aspx?id=15216>)
- SXSW edu 2012 Panel Discussion on STEAM (http://audio.sxsw.com/2012/podcasts/edu/06_Turning_STEM_to_STEAM.mp3) led by RISD President John Maeda
- Chronicle of Higher Education: Let's Get Serious About Cultivating Creativity (<http://chronicle.com/article/Lets-Get-Serious-About/128843/>)

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