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HASTAC: From STEM to STEAM

It's difficult to have a discussion about education these days without someone jumping to point out how critical STEM (science, technology, engineering, and math) skills are to the future of our nation. STEM, the line goes, is the key to unlocking innovation, being competitive in a global economy, and [winning the future](#). STEM is of course essential, but we can't ignore the important place that the arts and humanities hold in our ability to think creatively and devise solutions to humanity's great challenges.

The humanities [enjoy strong support at Duke](#), and examples of compelling humanist-based interdisciplinary scholarship on campus aren't hard to come by. However, one group's work in framing the arts and humanities as integral and complementary to STEM disciplines warrants extra notice.

We asked [Cathy Davidson*](#), co-founder of [HASTAC](#) (the Humanities, Arts, Science and Technology Alliance Collaboratory), to write a guest post highlighting just a few of the initiatives that are bridging the gap between the humanities and STEM education and thinking.

In his brilliant book *Love and Math: The Heart of Hidden Reality*, the renowned mathematician Edward Frenkel argues that, if you focus only on right answers and achievement scores in STEM, you kill the curiosity that lies at the heart of science. Kids are often natural scientists—curious, inventive, problem solvers. If you drill them in the product or facts rather than inspire them with the process, you drill any inquisitiveness right out of them.

What we really need is to rethink how we teach science, and especially how and why, for the last 150 years, we've thought it important to rope it off from the rest of learning. Leonardo and Galileo, even Einstein, for that matter, would have found it puzzling that we think that science and technology have no relationship to creativity, inspiration, ethics, culture, society, and even the kind of aesthetic passions that artists bring to work. Steve Jobs famously said, "Technology alone is not enough."

We agree. In 2002, a number of us across many fields came together to create [HASTAC](#), an alliance of humanists, artists, scientists, and technology developers that is administered by staff at Duke University and the University of California Humanities Research Institute. We created an open online collaboratory for working on interdisciplinary projects together. One of our mottos is "Difference is not our deficit; it's our operating system." Now over 12,500 network members strong, HASTAC is one of the most innovative learning networks in the world. Notably, HASTAC administers the John D. and Catherine T. MacArthur Foundation [Digital Media and Learning Competitions](#).

In 2010, HASTAC was proud to be part of Educate to Innovate, the White House initiative that encouraged innovative STEAM learning (which combines the STEM fields with the Arts and Humanities) — and this year, we've continued our commitment to STEAM inquiry with our administration of [Duke University's STEAM Challenge](#). The Duke STEAM Challenge is an undergraduate, graduate and professional student challenge designed to explore new ways that Science, Technology, Engineering, Arts, and Mathematics—along with the humanities and social sciences—might contribute to one another for the greater good. The Challenge ran August 2013-January 2014.

On January 18, eight interdisciplinary teams of Duke University students presented their plans to use STEM, humanities, arts, and social sciences concepts and strategies to solve some of the world's greatest problems. After their exciting and inspiring pitches and much deliberation by the panel of judges, the *Ambassadors for Change: ORS* project won the \$10,000 grand prize with their proposal to use artistic tools like cartoons and puppetry to teach adolescent Indian girls about oral rehydration therapy, a sugar and salt-water solution to treat dehydration caused by diarrhea.

All the teams proposed amazing ideas, which you can learn about at [dukesteamchallenge.org](#). Their projects show what can happen when people of different backgrounds and methodologies come together to solve the world's problems.

HASTAC is taking this idea a step further this spring with our global [FutureEd movement](#). FutureEd is designed to bring together professors, students, university administrators, business and political leaders, advocates, and the interested public to discuss the opportunities and challenges presented by innovations in the education sector and far beyond. After assessing the educational legacies we've inherited, we'll design new ways of learning for present needs and future aspirations.

An ever-growing list of people and institutions ([currently 75 and counting!](#)) are fueling this movement with experimental courses, workshops, seminars, research projects, and reading groups, offered from Berkeley to Lima, from Ireland to Rwanda. Everyone is welcome to contribute to the conversation. The more varied the participation, the more we will learn. They're coming together on Twitter, Facebook, and in blogs on [hastac.org](#) to share ideas about how to change education for the better. They're addressing questions like:

- What if we could start all over again and design higher education from scratch?
- What kinds of institutions of learning might we come up with?
- Or maybe we don't need any institutions at all?

In big ways and small, many of us are already experimenting with alternative ways of thinking, teaching, learning, and researching. FutureEd members are sharing their ideas, resources, pedagogical strategies and experiments, curricular overhauls, and more, to serve as a model and a starting point for others.

In addition to social media and HASTAC, people are also exchanging ideas on Coursera, via the MOOC I'm teaching: [The History and Future of \(Mostly\) Higher Education](#). This MOOC unites

more than 13,000 students from around the world to discuss the greatest challenges and opportunities that higher education currently faces. Our meta-MOOC is offering all kinds of experiments in peer-to-peer learning and assessment, in online discussion groups, and in interactive global forums on the subject of educational innovation.

Graduate students in my Duke ISIS 640/691 class serve as Designated Teaching Assistants and Community Leaders, transforming the static MOOC videos into interesting and thoughtful conversations. They also report on the MOOC twice a week for the Chronicle of Higher Education at chronicle.com/blogs/future/.

One of these students, William Osborn, described FutureEd as “[1 class, 14,000 teachers.](#)” It can be overwhelming at times, but in the most inspiring and thought-provoking way.

All of these connected projects and ideas are what HASTAC is all about: Changing the Way We Teach and Learn.

[*Cathy Davidson will be leaving Duke University for the Graduate Center of the City University of New York](#), but she will maintain an affiliation with Duke. HASTAC will continue to have an administrative hub at Duke as well.