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Graduating All Students Innovation-Ready

By Tony Wagner

Improving student achievement through innovation is the latest buzz in education. New test-prep programs, online learning platforms, e-texts, charter school hybrids, and so on are proliferating, but they are only changing the nature of how we deliver the same old content. No one seems to question exactly what students should be achieving beyond better test scores. What matters today, however, is not how much our students know, but what they can do with what they know. None of these innovations addresses this fundamental shift in what our students—and our nation—will need to succeed in the 21st century.

Knowledge today is a free commodity and growing exponentially. Khan Academy currently offers more than 3,300 K-12 video lessons for free, and more than 6 million students are logging on every month. And now, growing numbers of our elite private and state universities are offering no-cost online courses for anyone who is interested. Because opportunities for learning are ubiquitous and accessible on every Internet-connected device, students who know more than others no longer have a competitive advantage.

Our students now compete for jobs with talented students around the world who will work for far less. As a result, the high school and college graduates who will get and keep good jobs in the new global economy and contribute solutions to the world's most pressing problems are those who can bring what the author and *New York Times* columnist Thomas L. Friedman calls "**a spark of imagination**" to whatever they do. They will be creative problem-solvers who will generate improvements in existing products, processes, and services, as well as invent new ones. Rather than worry so much about graduating all students college-ready, I have come to understand that the most essential education challenge today is to graduate all students innovation-ready.

What does it take to create an innovator? Research for my new book, *Creating Innovators: The Making of Young People Who Will Change The World*, has turned up some surprising answers to this question. The assumption of many business leaders is that we need more science, technology, engineering, and math education. But the scores of young STEM innovators and social entrepreneurs whom I interviewed learned to innovate most often in spite of their "good" schooling—not because of it.

Some argue that innovators like Steve Jobs are born and not made, and so the schooling they get doesn't matter. However, I have come to understand that most young people can be taught to innovate in whatever they do. We are all born curious, creative, and imaginative. And the best schools—from pre-K to graduate school—continue to develop these capabilities in students. They do so not by

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delivering more-of-the-same education, but rather a very different education. Schools like High Tech High or the New Technology High Schools have established reputations for producing highly innovative graduates. But what and how these schools teach are radically at odds with conventional education.

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These schools focus primarily on teaching students skills and not merely academic content, including critical thinking and problem-solving, effective oral and written communication, and many of the other survival skills, such as collaboration and initiative, which I described in my last book, *The Global Achievement Gap*. They do so by engaging students in rich and challenging academic content—and yet, content mastery is not the primary objective of their courses. In all of the classes, students must use academic content to pose and solve problems and generate or answer complex questions. Students are required to apply what they have learned and show what they know. Frequently, they do this work in teams.

For example, 9th graders at High Tech High work in teams to imagine a new business, and then develop a detailed business plan that they present to local venture capitalists in San Diego. Some of their ideas, in fact, get funded. And all HTH seniors must complete a semesterlong team-based service-learning project in which a group works to solve a real problem in the community. One team I interviewed discovered that the local food pantry was not able to store the food it was collecting for needy families. So the students used a computer-aided-design program at their school to create a storage system. They then installed it at the pantry.

What is unique about these schools is the learning culture they have created.

All of them require collaboration in the classroom because they understand that innovation is a team sport. Most courses are interdisciplinary because, as Google's former director of talent, Judy Gilbert, explained when I interviewed her in 2011: "A more interdisciplinary approach to learning will better prepare people for the kind of problems they'll be confronting."

Understanding that innovation and self-confidence come from taking risks and learning from mistakes, teachers at the schools I've named encourage trial and error. Rather than talk about failure, they emphasize the importance of "iteration" in student work.

Perhaps my most surprising research finding is the extent to which young innovators—from both advantaged and disadvantaged backgrounds—are much more motivated by intrinsic rather than extrinsic incentives. Their parents, teachers, and mentors encourage exploratory play, the finding and pursuit of a passion, and the idea of giving back. All of the innovators that I interviewed want to make a difference in the world. It is this combination of play, passion, and purpose—rather than the carrot-and-stick motivation of most classrooms—that best develops the discipline and perseverance required to be a successful innovator.

To graduate all students innovation-ready will require very different thinking from what's currently being touted in education.

First, I believe the U.S. Department of Education and state education departments need to develop ways to assess essential skills with digital portfolios that follow students through school, and encourage the use of better tests like the College and Work Readiness Assessment. Administered by the Council for Aid to Education, the CWRA is an online test of problem-solving, complex thinking, and writing skills used by a

growing number of independent schools, public school districts, and colleges around the country. Second, we need to learn how to assess teachers' effectiveness by analysis of their students' work, rather than on the basis of a test score. Teachers and administrators should also build digital portfolios, which their principals and superintendents should assess periodically. Third, to push educational innovation, districts need to partner with one another, businesses, and nonprofits to establish true R&D labs—schools of choice that are developing 21st-century approaches to learning.

Finally, we need to incorporate a better understanding of how students are motivated to do their best work into our course and school designs. Google has a 20 percent rule, whereby all employees have the equivalent of one day a week to work on any project they choose. These projects have produced many of Google's most important innovations. I would like to see this same rule applied to every classroom in America, as a way to create time for students to pursue their own interests and continue to develop their sense of play, passion, and purpose.

Our students want to become innovators. Our economy needs them to become innovators. The question is: As educators, do we have the courage to disrupt conventional wisdom and pursue the innovations that matter most?

Tony Wagner is currently the innovation education fellow at the Technology & Entrepreneurship Center at Harvard University. Previously, he was the founder and co-director of the Change Leadership Group at the Harvard Graduate School of Education. This Commentary was adapted by Mr. Wagner for Education Week *from his recently published book,* Creating Innovators: The Making of Young People Who Will Change The World *(Scribner, 2012). His website is* ***www.tonywagner.com****.*

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