

Taken for Granted: A Big Idea about Fostering Innovation

By Beryl Lieff Benderly
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Did you know that a cell phone camera can double as a microscope, instantly flashing images of slides made in jungle villages many miles from the nearest microscope to health care professionals who can use them to make diagnoses?

That replacing the Portland cement routinely used in making concrete with another binder could substantially reduce the carbon dioxide now emitted in the concrete-making process?

That the palm oil grown on just 2600 acres of land could supply biodiesel equal to 5% of the needs of the nation of Panama?

Me neither. Those are only a few of the more than 100 original and useful ideas brought to light by a program at the University of California, Berkeley, that uses small amounts of money to unleash large amounts of innovative brainpower. It could well be a much more widely applicable model for how to spur and support scientific and technical originality among students and postdocs.

With every science policy maven from Norman Augustine (the industrialist who chaired the influential U.S. National Academies Gathering Storm report) to Elias Zerhouni (director of the National Institutes of Health) worrying aloud about how the United States can foster innovation and encourage young innovators, the program, known as Big Ideas @ Berkeley and run on a relative shoestring budget by the campus's special assistant to the chancellor for science and technology, Thomas Kalil, takes an unusual approach.

Kalil's brainchild is provocative because in many ways it is the antithesis of the grant-driven, rank-ridden academic system in which so many aspiring young researchers find themselves mired and their originality stymied. The program doesn't fret over status or seniority. It doesn't require specific credentials. It doesn't cost a lot of money. It keeps bureaucratic requirements to a minimum, and it aims not to bind would-be innovators to institutional support, requirements, and schedules but to teach them independence, self-reliance, and flexibility in bringing their inspirations to fruition.

Risky business

The Big Ideas philosophy is clear in the program's slogan, "Bears Breaking Barriers," a reference to Berkeley's ursine mascot, the Golden Bear. The program seeks out smart, innovative, and potentially high-impact notions and then takes a chance that at least some of them can succeed. The more interdisciplinary, insightful, and unexpected those ideas are, the better. Since 2005, Kalil says, "I've provided some level of assistance to over 130 projects."

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--Thomas Kalil

He finds his protégés mainly by running what he calls an American Idol of innovation. Teams and individuals from across the campus compete in a cluster of contests in nanoscience, information technology, health, energy, the environment, Third World development, and a few other areas. There's a separate contest for new courses and curricula and another for so-called idea labs, student-run organizations that bring people together from different labs, departments, schools, and even campuses who are working on similar problems. Annual prizes total nearly \$200,000, and winners can receive up to \$10,000.

Funders with more money could, of course, award bigger prizes. National funding agencies and foundations, please take note.

The rules are few and as simple as possible. At least one member of each team entering must be a Berkeley student, graduate or undergraduate (though Kalil says the concept could be just as applicable to postdocs, and teams often include postdocs). Entrants have to describe their project and the participants in 10 pages or less. Entries have to be received by an announced deadline. Committees of experts select the winners. Because of the rules' latitude, proposal styles and formats often vividly reveal the writers' personalities.

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The contests accomplish more than awarding prizes to a limited number of winners and runners-up, Kalil says. Through the competitions, "the most ambitious and idealistic and energetic students self-identify." Doing so gives winners and nonwinners alike access to two other resources that Big Ideas offers. One is Marketplace, a Web site on which projects needing support can advertise and through which would-be philanthropists seeking worthy causes, often Berkeley alumni, can direct cash and in-kind donations.

The other is Kalil's formidable network of contacts, built during his years as President Bill Clinton's deputy assistant for technology and economic policy and deputy director of the White House National Economic Council, and before that, in the Washington, D.C., office of a major law firm. He regularly activates his network to plug in young idea entrepreneurs, whom he then tells, "You need to talk to this person, and they're likely to fund your project." He aims to teach his young originators to "not accept the status quo as a given but as something that they can have an impact on by moving forward with their idea, and then by creating a virtuous circle between results that they're able to generate and our ability to mobilize additional resources to support their work as they make progress."

Powerful contacts

As if to illustrate the process, Big Ideas is itself the serendipitous outgrowth of a student brainstorm. Among the responsibilities of Kalil's main job is campuswide coordination of nanoscale science and engineering projects. One day, a pair of students, an engineer and an aspiring MBA, shared their plans to start a nanotechnology club. He arranged some funding "from one of the National Science Foundation centers [because] this was a legitimate education and outreach activity," he says. The club they started, now several hundred members strong and the prototype of "idea lab," sponsors activities including an annual forum with big-name speakers and hundreds of participants, as well as its own annual competitions. The group itself has won prizes and further funding in competitions for successful business plans.

"I was telling this to a friend of mine," Kalil recalls. As it happened, that friend was Stewart Brand, the

innovation and self-reliance guru best known for his Whole Earth Catalog , the once vastly influential bible of the 1960s counterculture. Pierre Omidyar, the founder of eBay, had recently asked Brand to find ways of investing \$200,000 from the Omidyar Network, a self-described "philanthropic investment firm ... committed to creating and fostering opportunity for people around the world," in worthy causes.

The tale of the students' bright idea so impressed Brand, Kalil says, that Brand "ended up giving me an unrestricted grant of \$20,000 ... to see if I could have the same kind of impact ... in other areas." Kalil put out the word that he was looking for innovative projects and "started getting so many high-quality proposals from all over the campus" that he decided to start a competition to award the money. Proposed projects continued to pour in, and "eventually Stewart signed over almost all of the funding that he'd been given" to support the young innovators Kalil was finding. Additional funds also came from the Berkeley student government and some other sponsors. "It just started to take off from there," Kalil says.

Teaching self-reliance

Raising money for the program is a big part of Kalil's work for Big Ideas. But once the seeds have been planted, Kalil eagerly sends his protégés out into the world. Once a team has "accomplished something, ... I can [often] go to a specific individual or foundation or company and say, 'These people are really on the ball. This is what they've managed to accomplish, this is what they want to do next, and this is how much it will cost.' Then people are willing to support a specific project as opposed to giving me some money [so that] I will empower Cal students to change the world."

Kalil's young innovators are certainly changing at least small parts of it. They are making water purification cheaper for Third World communities; perfecting low-cost solar heaters; building networks of communication and collaborating with scientists across the university, and, in some cases, the entire Bay area; building mobile digital devices that improve literacy education in Third World countries (a project that has more than \$300,000 in additional funding, including \$238,000 from the MacArthur Foundation); and much more.

Beyond innovations, Big Ideas is about developing what Kalil calls an "ecosystem" of innovation to help bright young people get from idea to reality by looking, if necessary, beyond obvious sources of help to find something that works for their project. "There's a value to giving [young people] more autonomy early in their career. There's a value to encouraging them to identify something that they're passionate about," Kalil says. "What gives me confidence to do it is the track record of the students that I've worked with and the fact that I'm placing small enough bets on them [that] they don't all need to succeed." With Americans so worried about the future of innovation and so many scientifically and technically trained young people frustrated by the current structure of research, Kalil's program seems like an idea that deserves the close attention of funders, both public and private, from institutions and organizations across the nation.

Beryl Lieff Benderly writes from Washington, D.C.