

Change the World? Create a Culture of Innovation

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Ted Pavlic, one of my university's engineering professors, studies ants. With background in engineering, computer science, behavior ecology and evolutionary biology, he's exploring how the information sharing of these socially complex insects offers insights into effective crowd computing or other automation systems. It's the kind of transdisciplinary project that we encourage to address and solve societal challenges.

We take great delight when such work yields results, of course. But the focus on individual innovations can cause us to miss the larger mission: to create a culture of innovation that makes innovation at scale possible.

Individual breakthroughs and "a-ha" moments typically play the starring role in the history of invention and innovation, particularly because they are easily understood, dramatic and highlight compelling personalities (think Thomas Edison, the Wright Brothers, Steve Jobs).

Yet real innovations are not iPhones or some other exciting piece of technology, but rather how we organize our creative process and the structures in which we make things. That's why research universities, as

knowledge-producing enterprises, have an extraordinary opportunity to transform our world.

There is a hitch in this: Universities are usually culturally rigid, ossified bodies; there is typically a great deal of resistance to changing the culture. This is an obstacle, but not insurmountable.

At [Arizona State University](#), we reimagined a number of existing structures to drive a culture of innovation and create a mindset of perpetual innovation on all fronts. We understood that if we didn't rethink and change the structure, we will keep getting the same results.

We operated on the assumption that educational attainment and technological advancement is achievable by a socio-economically diverse cross-section of the population. We also posited that research universities have the potential to tackle and solve grand challenges—for example, social justice, alleviating poverty, access to clean water, sustainable development—when there is a commitment to engage with and improve society. That meant a multilevel focus on research, teaching and entrepreneurship.

Consider a few examples:

- We rebuilt our [schools of engineering](#) to tackle and solve grand challenges. That meant doing away with 11 traditional engineering departments; urging first-year students to begin problem-solving and thinking like an engineer the first week they arrive; creating a student-centric environment in which talented new faculty handle a lot of research and a lot of teaching; and creating programs and a mindset geared toward entrepreneurship.

- Our future-minded emphasis on innovation also meant getting used to skeptical glances when we launched enterprises with names like “[The Center for Bio-Mediated and Bio-Inspired Geotechnics](#).” But this solutions-focused, National Science Foundation-funded project has brought together dozens of companies as well as Georgia Tech, New Mexico State and UC Davis as partners to pursue transformational results—engineering buildings or other structures using redwood DNA, for example, or air cleaning systems built from plants. This includes using photosynthetic, energy-producing systems that are built right into the actual walls of the structure. If successful, it portends a game-changing industrial future for my state (and beyond).
- We also have created many other cross-disciplinary schools and centers that link traditionally discrete academic disciplines, connect with the larger world to identify and address real-world problems, and accelerate student involvement (and excitement) from Day One. Our [College of Public Service & Community Solutions](#)—which brings together studies in criminal justice, social work, public affairs, and community resources and development—engages with over 800 partners to make the “classroom” experience an opportunity to get out into the community to conduct research and make a difference (measuring the impact of body cameras, for example).

I could mention dozens of other examples. But the continuous thread that connects all this work is an explicit commitment to innovation—and to pursuing, with ambition and energy, societal impact.

As a university, that requires vigorous interaction between research, teaching and entrepreneurial application of new knowledge. It also

means a willingness to adapt and take risks and rethink institutional roles and identities.

This often turbulent reality is not for everybody; disruption is hard. Sometimes, in the pursuit of progress, it leads to mistakes and failures. But at a time of great need in the US and globally, it creates the conditions for rapid change, genuine advancements and real innovation.