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# Adding Value to Teaching

**What can we offer that students can't get online?**

ONE OF THE most profound effects of the Internet is the democratization of knowledge. So why are we teaching our undergraduate engineering students as though it's still the Middle Ages?

Traditional professorial behavior – standing at the front of the room, being only slightly less boring than the walls, and presenting knowledge for students to consume–is on the verge of being obsolete. If someone watching a video of your class gets as much out of it as someone who's physically there, then you're completely replaceable, because right now someone just like you is uploading a video of lectures, complete with slide deck and notes.

Don't believe me? Check out the Khan Academy Channel on YouTube. Started by Sal Khan, a former hedge fund analyst in Mountain View, Calif., it has grown to 1,500 videos, viewed 100,000 times a day. Khan is on a mission to educate the world, and his nonprofit is backed by venture capitalists like John Doerr. With Khan Academy and online resources like MIT's Open CourseWare, students all over the globe are starting to find the tools they need to learn on their own time, at their own pace–and for free.

So what are we offering them at engineering schools? Well, for a start, a credential. But the cost of tuition has been rapidly outpacing inflation for the past few decades, and many graduates are starting their professional careers heavily constrained by student debt. And in a rapidly changing world, the ability to learn and evolve might soon become as important as a diploma. We're asking our students for four years of their life and an awful lot of their money. What if they decide that it's no longer cost-effective to get a degree?

But engineering schools have the opportunity to offer students much more than just a seal of approval. There are at least three educational elements that can't be replaced online, at least at the moment: membership in a learning community, individualized mentorship, and hands-on practice (including access to scientific and engineering equipment).

An engineering education that is designed around lectures is missing out on the added value that a campus experience can offer. And while it's daunting to think about teaching in a different way, most engineering educators do have a wellspring on which to draw. If you teach engineering, think about what your graduate school experience was like: working in small groups of committed learners, exploring and learning a research area of your own choosing, receiving individualized mentorship from your adviser, having ownership of your project, using research equipment, and, above all, learning how to learn.

It's no coincidence that these types of skills – design, teamwork, communication, lifelong learning – have been identified by groups like ABET and the National Academy of Engineering as key to creating engineers who can respond to global challenges. An emphasis on authentic projects, individualized instruction, and self-direction will not only serve our students well as they start their careers; it's also the only way to keep a college education relevant in a world where knowledge is a utility, available on demand.

> ENGINEERING EDUCATORS NEED TO DRAW ON THEIR OWN GRAD-SCHOOL EXPERIENCE AND OFFER MENTORSHIP, PROJECTS, AND A CHANCE FOR SELF-DIRECTED LEARNING.

The Internet and the Web are massively disruptive technologies, and education is certain to be affected. But, for engineering educators, this is a tremendous opportunity: a chance to stop thinking of our undergraduate students as passive recipients of knowledge and instead to start fostering their development as learners who are actively engaged in their own education.

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