

**iFoundry as Connecting Dots, Changing Minds,  
and Teaching the Missing Basics**

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iFoundry was initiated as an official College activity at the end of August 2008, and the last 8 months have been quite a ride. The school year started with the launch of a YouTube channel, the signing of the Olin-Illinois Partnership, the holding of a Workshop on the First Year in Engineering, and the establishment, in rapid succession, of the iFoundry Council, the iFoundry Fellows program, and the iFoundry student action teams. The school year closes with a Summit on the Engineer of the Future, with nearly one-hundred students signing up to be in the first iFoundry cohort, and with 11 departments signing agreements permitting these students to participate in the activity. Along the way some 19 iFoundry-related talks were presented, 9 iFoundry-related papers were written, and \$2.7M of iFoundry proposals were submitted, and the proposal activity has already yielded a return on investment of over 300% to the College and the University.

But we come together today, not just to reflect on a great year, but to reflect about what iFoundry is doing, and how and why it is doing it. iFoundry started as an idea, and one way to interrogate ideas

is to critically examine the language we use to express them, and here I consider three iFoundry phrases in turn.

One of the phrases that we use in describing iFoundry is that “iFoundry is not a dot, it connects dots,” and by this we mean two things. First, when we say that iFoundry “is not a dot,” we are suggesting that it is lean and entrepreneurial, that it should have a light administrative footprint. Second, when we say that iFoundry “connects dots” we are suggesting that a key difficulty in transforming engineering education is *organizational*. Illinois has great pieces, great dots, but a critical challenge we face is finding new ways to get the pieces to work together. The organizational challenge of our postmodern, creative era is largely one of *integration*, and iFoundry faces that challenge head on, in its principles, institutional artifacts, and its structural form.

Another thing we say about iFoundry is that we need to “change minds before changing courses,” and this expression recognizes that organizational change only comes about when people within an organization understand the challenges the organization faces. Harvard Business Professor Michael Watkins has a model of organizational change called the STaRS model, and in that model the trickiest type of change is what Watkins calls *realignment*. Simply stated, when an organization is in need of realignment, it needs to change but doesn’t yet know it. In such cases, Watkins calls for high

levels of *collective learning* and communication and a more patient and deliberate pace of *doing*. iFoundry has worked very hard to initiate a conversation and get people talking about change, examining how others have changed, considering the reasons and need for change. Some of you already persuaded of the need for change have sometimes asked why iFoundry doesn't move faster, but iFoundry's pace and distribution of activities have been designed explicitly to move the organization as fast it can, but no faster.

Finally, iFoundry members sometimes say that “the missing basics are just as important as the basics.” Engineering professors defend the status quo of engineering education by invoking “the basics” by which they mean math, science, and engineering science, and no one is suggesting that math, science, and engineering science are not extremely important to being a modern engineer. But the iFoundry term “the missing basics” refers to graduating engineering students who are unable to ask good questions, label patterns, model qualitatively, measure things, decompose problems, ideate, or communicate. It is becoming increasingly clear that something must be done to inject the missing basics into the core engineering curriculum, that the missing basics may also be missing links to interdisciplinary education as well as lifelong learning.

These three phrases—“dot connecting,” “changing minds,” and “the missing basics”—communicate some of the ways in which

iFoundry is an intellectually distinctive initiative, but iFoundry is not merely ideas. Fundamentally iFoundry is about people, lots of people. In the interest of continuing our mirth and merriment I won't list everyone by name, but I do want to thank all of the people who have helped iFoundry to this point. I want to thank Provost Katehi and Dean Ade for the support that kicked things off, Dean Tucker for his commitment to making transformation a cornerstone of his tenure as undergraduate dean, and Professor Dodds for his support from the earliest moments of the idea. I want to thank my iFoundry core colleagues, the iFoundry Fellows, the iFoundry Council, the iFoundry student action teams, our colleagues in AE3, the IEE team and reading group, and all of the College of Engineering staff who have helped in so many different ways. The faculty on both sides of Green who supported Engineering and Technology Studies at Illinois (ETSI) were early and continuing supporters and they deserve special mention. Finally, I want to acknowledge my closest teammates Andreas Cangellaris, Ray Price, and Karen Hyman for all that they've done.

As I said, Illinois has great dots. It's been a blast connecting them so far, and we look forward to a fall filled with more profitable dot connecting, mind changing, and the teaching of the missing basics.