An entrepreneur's quest to build an EdTech product out of her invention

blogs.lse.ac.uk/businessreview/2016/09/20/an-entrepreneurs-quest-to-build-an-edtech-product-out-of-her-invention/

9/20/2016

The purpose of education is to produce happy, healthy, impactful lives, and let society reap the benefits. At first glance, this may not seem controversial, but taken to its radical extreme, this purpose statement — the core tenet of my company, Socos — leads to a fundamentally different approach to education, parenting, and even management. Every action by a parent or manager is selected explicitly based on its predicted impact on the life outcomes of each child or employee. Nothing else matters, however sacred.

Don't worry, we are not about to dive into a wonky discussion on education policy. The implications are better understood as a story of innovation. (As Richard Feynman apparently never said, "If you can't build it, you don't understand it.") For me, this story began in 2007. I had completed my PhD at Carnegie Mellon University the previous year and was a researcher at the Redwood Center for Theoretical Neuroscience at UC Berkeley. My wife and I had an idea for a technology to end all high-stakes testing, and we cofounded my first tech startup, Augniscient. Rather than providing structured problems to students like a standard online tutor, we developed a technology to turn unstructured data such as online discussions directly into *formative assessments*. In other words, by "listening" to students talk to each other we could predict their performance in the class without ever giving them a formal test.

As we saw it, teachers could then adapt their instruction for every student. Why waste time on standardized tests if we can predict the outcomes? Instead, focus on teaching until every student masters the required skills. My wife and I eventually published papers showing that we could predict not just grades but performance on individual final exam questions directly from student conversations.

As an EdTech startup, however, Augniscient was mostly an education for me. (For example, choose a pronounceable company name.) I was a classic academic-turned-entrepreneur; I had an invention and assumed that the world would happily do all of the hard work needed to see my "genius" brought to market. Over three years, I

learned that a technology is not a product, a product is not a business plan, and a business plan is not a business. I also learned that venture capital is not well aligned with education. If you have a truly innovative technology, there is almost always a better business than education. To paraphrase one VC, “You can read students’ minds? Here’s $2 million to do financial fraud detection.” We were quickly pushed away from education and into the then-nascent field of behavior analytics as one of the first companies focusing on unstructured log analysis (yes, I know…so sexy). Sick of the slow drift toward advertising, we sold the company.

The path from the CIA to Carnegie Learning to Augniscient brought me part of the way to Socos. I was able to invent technologies which could radically transform education, but I still didn’t know what that transformation should be. My focus on obviating high-stakes, biased testing still assumed that the purpose of education was to learn how to factorize a polynomial and who signed the Peace of Westphalia. I had not yet asked the simple but profound question, “Why?”

Perhaps unsurprisingly, the inspiration for this much more radical step didn’t come from my experiences in EdTech. Late in 2011, I was approached by a small startup called Gild. Their purpose was to take bias out of the hiring process. They had developed a product which mined through all open-source code repositories (e.g., GitHub and BitBucket) and surfaced the best software developers based on the quality of their code rather than traditional criteria, like schools or work history.

Unfortunately, all of the open-source developers in the world didn’t make for a sufficiently compelling product. So, I came on board as Chief Scientist to make the product predictive, moving from direct code analysis of 100,000 open source developers to surfacing predictive characteristics across tens of thousands of variables applied to tens of millions of people. In the end, we had built a database of over 122 million people from hundreds of public sources across every professional job vertical.

While the story of Gild is fascinating on its own, it was my work building predictive models of work quality and career success that turned education completely on its head for me. I found that most traditional characteristics used in recruiting — grades, test scores, university — were at best only weakly predictive of quality of work. I wasn’t completely surprised, there was already substantial body of research findings, but I was quite surprised to discover that even skills and ‘knowledges’, whether claimed on a résumé and inferred from a work history, were not predictive.

Yes, you need to know how to program to be a programmer, but beyond that it told us very little about your impact. Instead, I saw the emergence of a completely different set of predictive characteristics: general cognitive ability, meta-cognition, emotion perception & regulation, creativity, and motivation. Unlike traditional hiring criteria, these were domain-general, as predictive for an athlete as for a programmer. While they were correlated with academic performance, it became clear that these were the ultimate causal variables. Most importantly, these are the same constructs which hundreds of scientific studies have shown to predict the life outcomes of young children.

Programmers aren’t successful because they know how to program in Java or Python; they are successful because of qualities like self-efficacy, endogenous motivation, and working memory. They are successful because they are problem solvers. The same is true for designers, saleswomen, CEOs, and professional athletes. Of course, we don’t teach skills and ‘knowledges’ in school out of malice but we have the direction of causation wrong. A craftsman without their tools is hobbled, but tools without a craftsman are pointless.

With all of this in mind I launched Socos. We invented AI technology, *deep cognitive models,* which can analyze images, speech, writing, and more. We abandoned any focus on traditional skills learning or assessment and pointed our models at the causal factors leading to positive life outcomes. But that still left a big question: what the hell is our product?

People need answers; they don’t need more data. Across my many startups, as a founder and advisor, I have learned the importance making products that do the hard work rather than expecting your customers to do it for you.

(They won't!) The ability to even weakly predict children's life outcomes — health, education, income, happiness — is a frightening and profound power. For Socos it has come to mean one simple message each day: *Parents, here is the one thing you can do tonight that will have the biggest impact on your child's life*. There is no gamification, no study material, no dashboards. Share pictures of your child's artwork, samples of their speech, and answers to a single question each day, all voluntary, and we will provide a simple daily activity designed to improve that specific child's productivity and well-being, integrated across their life. This is Muse.

Keeping Muse extremely streamlined as a product vastly expands our addressable market. Although it can run on multiple platforms, we can deliver the entire core value via SMS. That means we can reach any family with nothing more than a feature phone and a mobile connection. There is no assumption that a child has access to a tablet, smartphone, or even a classroom. The Muse AI lives entirely on our servers and is just "chatting" with the parents. We don't need anything more from them than a willingness to spend 10-30 minutes playing with their kids. Anything less than that and we simply become part of the educational arms race, businesses whose sole purpose is helping successful families pass their advantages on to their children. It's a great business…that changes nothing.

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Notes:

- *The post gives the views of its author, not the position of LSE Business Review or the London School of Economics.*
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Vivienne Ming, named one of 10 Women to Watch in Tech by Inc. Magazine, is a theoretical neuroscientist, technologist and entrepreneur. She is the co-founder and Managing Partner of Socos. Previously, Dr. Ming was Chief Scientist at Gild, a startup that builds better companies by unleashing human potential in their workforce using machine learning. She is a visiting scholar at UC Berkeley's Redwood Center for Theoretical Neuroscience pursuing her research in cognitive prosthetics. In her free time, Dr. Ming also explores augmented cognition using technology like Google Glass and has been developing predictive models of diabetes and bipolar disorder. She sits on the boards of StartOut and Our Family Coalition, and speaks on issues of LGBT inclusion and gender in technology. She lives in Berkeley with her wife and their two children. Her work and research has received extensive media attention including the New York Times, NPR, Nature, O Magazine, Forbes, and The Atlantic.