

PHD entREpreneur



a lecture by

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PhD[c]

After graduation, only one in five of today's PhDs will become full professors. Three in five will become bureaucrats or employees.

What will happen to the one PhD who leaves academe to chase the American Dream?

In this free public lecture, Brian (a cognitive scientist and an entrepreneur) will share his predictions and insights about this road- less-travelled.

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Preface by the Speaker

The idea for this speech began when my friends and family started asking what I would do after graduating with my PhD in psychology. Folks tended to get a bit confused when I replied that my plan is to start a business. *You don't need a PhD to do that!*

It's true. The path leading from PhD to Entrepreneur is a road-less-taken. And yet, the path is gaining both feasibility and popularity. Years from now, when historians of academia evaluate the early 2100s, they will classify me as an "early adopter" of the PhD-Entrepreneur identity. That's what I predict, anyway. The speech provides a socio-economical argument to support that prediction.

The first version of this speech was given in May 2013, at my PhD graduation at the Hinckley Institute of Politics Caucus Room, University of Utah. It was a small crowd, with just my closest friends, family, and mentors in attendance. The video for this speech is available at <http://youtu.be/5t8eW1FUT2U>

You will notice that the content of this document is a bit different than the video. That is because I have updated and clarified a variety of points in my argument. Comparing the video with this document may provide a glimpse of how someone at my stage of career builds a self-referential narrative.

I hope that you enjoy the speech and that you gain something of value to your own career path or studies.

The PhD Entrepreneur:

Notes from an Early Adopter

I'm here to talk about a non-traditional career path for PhD students, which leads out of academe and into the world of business leadership and innovation; a path I myself am taking. One of my core arguments will be that I am an early adopter, or early follower of this path. I will be describing a trend that could be called "the industrialization of academia" which has begun (and will continue) to favor the development of industrious PhDs.

Let me begin by suggesting that -- if you're watching a recording of this speech, and only want to hear some tips about how to become a PhD entrepreneur, you should fast-forward about fifteen minutes. For the rest of you fine folks, if I start rambling, or if you lose me somewhere during the speech, just remember one thing:

Successful intellectuals, like successful entrepreneurs, are experts in niche construction.

What does "niche construction" mean? It is a term that business thought-leaders have adopted from ecological theory. In ecology, niche construction is what beavers do when they build dams.

The whole process is fascinating to watch in nature. Beavers are one of the stranger and more inventive creatures on the planet, working at night to use sticks and mud like bricks and mortar. In certain cases, a single team of beavers can repair a completely destroyed dam in one night. This process turns what was a stream bed into a pond; and this pond is the beaver's niche -- it's preferred habitat. Ecologists call this process "niche construction."

Later, I will discuss the meaning of the term in the world of business, but before that I'm going to describe some trends that favor those intellectuals and entrepreneurs who excel at niche construction. I am not a prophet and this speech is no expose. However, there are some disturbing trends afoot that I will be addressing head-on.

The world of academe is changing. Tomorrow's professors and doctoral candidates will likely be more industrious than yesterday's. Meanwhile, the skill of niche construction will become

increasingly important to both academics and entrepreneurs.

Entrepreneurs and academics don't usually cross paths. In fact, they don't tend to like each other very much. So it may sound strange that I advocate a shared skill between two groups that tend to, shall we say, drink at different pubs.

On one side, entrepreneurial types joke to each other: "If you can't do, then teach." Which, of course, is a way of saying that academics are not savvy enough to hack it in the real world. On the other side, academic types joke to each other: "If you can't get tenure, you can always consult." Which, of course, is a way of saying that entrepreneurs are not smart enough to hack it in the Ivory Tower.

Personally, I think all of that shop talk is a ridiculous waste of time. Professors and entrepreneurs are equally respectable and equally important to the well-being of society. Many professors are awfully savvy and many entrepreneurs are incredibly smart. So, those adages, in my opinion are straw men that will receive no further attention here.

There is, however, a pithy quote that has captured my attention for the past year: "The PhD is someone who forgoes present income in order to forego future income." - unknown

As an institution, higher education is going through tough times. For example, the tenure system appears to be changing. If you don't know about the process of earning tenure, let me explain.

Tenure is an honor that not every professor receives. Getting tenure typically requires that you do very well in graduate school, publishing in prestigious journals as the first-listed author; then moving into a postdoctoral research position where you attract some 30-50 thousand dollars in grant money; then moving into an Assistant Professorship, attracting another 50-100 thousand grant dollars, then moving into an Associate Professorship, attracting multiple hundreds of thousands of grant dollars. Then, and only then, after your hair has prematurely turned gray or fallen out, usually 20 years after you began graduate school... only then are you eligible for a Full Professorship and tenure.

It's an undeniably difficult road, but tenure is a pretty sweet deal. It is what every academic works towards. For professors, tenure means job security and intellectual freedom and, for many

PhDs, chasing tenure is the only feasible way forward.

The question being debated among higher education leaders is: What will happen as institutions rely more heavily on people with PhDs or Masters degrees who are willing to teach University courses for hire on a part-time basis. Adjunct Professors, as they are called, are more expensive to hire than graduate students, but are far less expensive than full-time professors, who rightly expect health insurance, retirement benefits and perks.

Because it helps them lower operational costs, Universities are increasingly turning to Adjuncts to teach undergraduate courses. Evidence for this trend can be seen around the world. The number of PhDs who are unable to find academic positions and are willing to accept part-time positions has skyrocketed over the last 20 years. According to the National Science Foundation, only 1 in 5 PhDs land a full-time academic position right after graduation. Even 10-14 years after graduation, less than 50% of PhDs are on a tenure-track -- a percentage that is getting smaller every year.

This surplus of PhDs means that Universities can start being more selective about which professors get tenure and which ones don't. They can also be more selective about which PhDs are offered full-time jobs and which ones are not. On the face of it, this is good news for a University's balance sheet.

In contrast, there are MOOC's - Massive Open Online Courses. College students today can take online classes that are run by professors at Yale, Stanford, Berkeley, and other top-notch institutions. There is no enrollment cap, so thousands of students can and do enroll in any given course. If he or she wants to get University credit for the course, each MOOC student can elect to pay a small fee and take the course exams.

MOOCs present a serious threat to Universities that thrive on attracting out-of-towners. Within a few years, smart kids in the rural midwest will no longer have to move to Lansing to attend Michigan State. Literally anyone from anywhere could attend Berkeley from the comfort of their parents' living room. If Michigan State lost its ability to attract out-of-towners, economists would call this a loss of demand for the service that Michigan State provides. So, dust off your old macroeconomic knowledge real quick and someone tell me:

What happens to the price of Widget X when (i) the supply (or the cost of producing) Widget X remains constant, but (ii) the demand for Widget X decreases? The price will go....? The price

will go down, that's right. So the surplus of PhDs and the overnight sensation of MOOCs should cause the price of undergraduate degrees to make what I like to call "the Icarus turn".

What will this loss of revenue do to Universities that depend on attracting revenue from out-of-towners? It will certainly compromise their ability to offer tenure-track full-time professorships. In time, most of the courses at these Universities will be taught by Adjuncts.

Eventually, many Universities will be forced to adapt to a revenue stream that no longer includes out-of-town undergraduates. Five million students will be taught by 500 highly-effective Ivy League professors. At that time, many full-time professors will be offered part-time jobs instead, and today's Adjuncts will be let go. And, if it gets out of hand, some college towns will become ghost towns.

This talk is supposed to be just as much about entrepreneurs as it is about academics. And I promise, I am getting to the stuff about industry, but first I want to revisit our rodent friends, the beavers, and think again about niche construction.

Imagine what happens when beavers build their dam. Before beavers do their thing, a water stream flows through the local area. After beavers build their dams, the rate of water flow slows and standing water fills in the space. The local area becomes a pond. This environmental change fosters the survival of beavers, but it is often a giant pain for other species. For example, the ponds might kill off local trees, which is deadly to animals who inhabit or otherwise depend on those trees. In other words, dam-building creates an ecological trade-off with winners and losers.

In society, niche construction is the dark thing that happened when imperialists set up Catholic Cathedrals on top of Mayan temple yards. Niche construction is also the bright thing that happened when a piece of legislature abolished slavery. And, yes, it is also what happened when the iPod came along and all-of-a-sudden it was embarrassing to own a Sony walkman. In this way, niche construction is both creative and destructive. Niche construction is creative destruction.

I mentioned earlier that the ability to attract out-of-town undergraduates -- which is one foundation of higher education's revenue model -- appears to be eroding. In other words, I am

claiming that the traditional revenue model of higher education is being destroyed.

I believe that MOOCs and Adjuncts are not the only things replacing the traditional approach. In fact, Universities have located a new revenue stream and have hired teams of “beavers” to build a series of new “dams.”

If you read the mission statement of the University of Utah, you will see the phrase “technology transfer” in its very first sentence. Technology transfer, or technology commercialization, is the construction of a niche for some invention. It is the commodification of an idea, and it is the way in which an intellectual creates property. Technology transfer often involves patents, investments, operating agreements, corporations, and equity.

At the University of Utah and elsewhere, there are a growing number of professors who invent products. Because the professors work for the University, their inventions belong to the University. This means that the products are a revenue stream for the University. That is to say, the University has a vested interest in building a niche for each of its professor-inventors. To that end, they employ teams of niche constructors.

One team of niche constructors goes by the name of “TCO” for technology commercialization offices. [Note: As of June 2013, they have rebranded as simply “Technology and Venture Commercialization” or TVC.] Essentially, the TCO is a team of lawyers and business leaders who help professor-inventors negotiate with investors and formalize the terms of their technology transfer. This process typically involves many months and even years, and the TCO is intended to provide a consistent point of contact and source of guidance throughout the inevitable twists and turns in the road.

The emergence of University TCOs is a very important trend in higher education, but not all University niche construction teams go by the name of TCO. For example, here at the University of Utah, the “Lassonde Entrepreneur Center” is run by Troy D’Ambrosio. He leads teams of student entrepreneurs to create business plans for the University’s professor-inventors. This work is free to the professor and is a great learning opportunity for the students; it’s a win-win.

Currently, most professors do not have any contact with offices like the TCO or Lassonde. This is because professors are not usually inventors. Most professors create products for the

academic journal market.

Have you seen “Good Will Hunting?” Remember when Will (played by Matt Damon) meets the psychology professor (played by Robin Williams)? Will says that he has read the professor’s book and the professor replies, “Oh, so you’re the one.” This is a joke that many professors have made to one another. It is one of those jokes that is funny because it is true. Most academic articles are read by a small number of very wonky, very like-minded people.

And that fact -- the obscurity of academic output -- that luxury is eroding, just like the old revenue model of higher education. As Adjuncts are hired to teach most of the courses and -- later -- as undergraduate enrollment numbers are lost to MOOCs, Universities will give tenure to a smaller and smaller number of PhDs.

At that point, this obscurity, this Ivory Tower up on the hill, separated from the real world, this disdain for market forces, and (if you recall the pithy quote I mentioned at the beginning), this “forgoing of present income so as to forgo future income” -- this ethos will be creatively destroyed.

What will take the place of the old-fashioned anti-business ethos? The new standard for intellectual prowess will have to be the savvy industrious programs and professors, such as those in MIT’s media labs.

To be clear, tenure is not going to disappear. However, we will see a definite shift in the criteria used to evaluate an academic’s eligibility for tenure. The new standards will include inventions, patents, and other intellectual property artifacts. Currently, professors are judged in part by how many grant-dollars they bring into their department. In the future, professors could be judged by the number of investment-dollars they attract.

To summarize, I am arguing that higher education is undergoing a fundamental re-orientation. It may sound like I am preaching doom and gloom but in fact I am not. First of all, I have claimed that the price of an undergraduate degree will be lower in the future and that students will not be forced to migrate. I have also claimed that tomorrow’s academic leaders will be more industrious than yesterday’s academic purists.

These shifts are not only a thing of the future. The trends are apparent now. In fact, my own career path is an outgrowth of the industrialization of academia. Of course, my path is

nontraditional. Not many PhDs become entrepreneurs outside of academia. However, it would be a mistake to think of me as counter-cultural or as a statistical outlier. Instead, think of me as an early adopter, or an early follower of a career path that is just beginning to come of age.

All this talk of trends and the future of academia begs a question: What does the industrialization of academia mean for tomorrow's graduate students? How should tomorrow's graduate students approach the doctorate? If you are considering an academic career, I have some advice.

1. Decide whether grad school is right for you.

It helps to take a personal inventory of your preferences and your stage of career. If you are seriously thinking about an academic career, you have probably already taken a high stakes test like the GRE and you probably scored well. So, you know that you are smart and that's good to know, but it does not tell you what to do with your career.

I am thinking of folks who are trying to decide between becoming an academic or becoming an entrepreneur. There are basically two kinds of people that want to become an entrepreneur.

The first type have an idea, have prototyped the idea, probably have a website, and are actively recruiting a team to work on bringing that idea to market. You might not have any funding yet, but you are about to start asking for some. When I was 25 and decided to enter graduate school, I was not this first type.

The second type of person who wants to become an entrepreneur has lots of new product ideas and talks about them with folks at dinner parties and over beers, but they have not decided on one idea to pursue and are not ready to start recruiting a team and getting the thing off the ground.

If you are the first kind, my advice is not to enter graduate school. Just work in your business. You won't be able to meet the demands of angels or VCs and, at the same time, meet the demands of an academic mentor and a dissertation committee. If, however, you are the second kind (like I was), and if you scored very well on your GREs, I have some more advice for you.

2. Complete your doctorate under a Professor / Inventor.

That's what I did. Dr. John Kircher, my academic mentor, is in the room. Back in the early 1980s, when PacMan was a new thing in the world, John invented the first computerized lie detector. This required him to learn a lot about physiology, and also a lot about computers. He coded everything on Fortran punch cards. This work began during graduate school and culminated during his first few years as a Professor with the commercialization of "CPS" (the Computerized Polygraph System).

Thirty years later, John is commercializing another deception detection technology, which is something that I had a small part in. John's new computer-administered deception test uses eye tracking cameras to detect where the test taker is looking and how the size of her pupil changes while she takes the test. It's a cool technology, and working for John was enlightening. As John's right-hand, my time in graduate school involved flying around the world, meeting eye tracking vendors, planning and setting up projects, training people on how to use eye trackers, debugging software glitches, strengthening operational procedures, and building relationships.

As John's understudy, I watched him wrestle with the risks and trade-offs required in technology transfer. I listened to him make sense of his relationships with the TCO, Lassonde, angel investors and venture capitalists.

On the one hand, these experiences were worthless as far as getting publications on my academic resume. On the other hand, I gained invaluable preparation for my next steps as an entrepreneur.

So, if you have good GRE scores and you are not ready to take those prototypes from the garage to the market, then my advice is for you to find a Professor-Inventor in your field of interest and recruit them to be your mentor. As you serve them, imagine how you might handle the stresses they are under. Earn their respect and their trust by working hard, working long, and working smart. But don't focus only on your mentor.

3. Earn the respect and trust of your fellow graduate students.

Spend time with students who are stronger than you. If your thing is coding programs but you are not so good at writing papers, find ways to work with the best writer in your cohort. And, while you are working together, start talking about your business ideas. See what they think.

For example, my own strengths tend to be in bridging ideas from different realms of inquiry. My

research style involves reading voraciously from a variety of scientific disciplines. As a result, my ideas tend to be stimulating and my writing tends to be enjoyable for the reader. However, I am a slow writer and my best ideas take weeks or even months to percolate.

My leadership style is gentle but energetic. I have learned to surround myself with better planners and plan-implementers than myself. In group projects, I have concerned myself less with dominating the social dynamic or getting people to do what I tell them to do. Instead, I listen closely to people, ask lots of questions of my group members, take in their ideas, challenge the ideas, and stay up late at night thinking about the ideas. Then, I write the group an email that thoughtfully captures the essence of what our group needs to do. At that point, the planners and implementers take over, handing out tasks and deadlines.

If you take the approach that involves listening, people will like you more. It earns their respect and their trust. Of course, there are other ways to earn props from your grad school peers. For example, you can (and should) tell people about the work you do with your mentor. Talk about leadership styles and how you would do the things your mentor has to do.

This will get your peers imagining you in a leadership role. It will help them see how industrious you are. It will not, however, show them your intellectual side. This brings me to the next bit of advice.

4. Forget about becoming an academic, focus on becoming an intellectual.

Academics publish papers. Intellectuals are thought leaders. My advice is that you do the bare minimum of academic publishing, but also that you take every chance to present your ideas in person in front of an academic audience.

When it comes time for you to make any type of presentation -- this is important -- you have to hit a home run. This is what charismatic leaders do. They inspire people with new ideas. For example, one of my best graduate school papers was titled: "Everything about the mind is older than we thought". We had to present the paper in class, and for my this presentation, I focused on memory. I argued that the concept of memory is apparent in very old species, like slime and bacteria. To a group of psychologists, it is a little twisted to suggest that memory is apparent in species that do not have a brain. This idea is a bit radical, but it is also academically-viable. It has absolutely no market application, but it has a wow-factor. My presentation was compelling; it

stood out and landed me some important social capital.

As you come to the end of your time in graduate school, you will have given 10 or more presentations in front of your peers. By that time, they will have sniffed out whether you are the type of person that can inspire a crowd. They will see you as an industrious intellectual.

At the same time, you will be able to sniff out a whole suite of intellectual strengths among your peers. By leveraging a bit of your social capital -- that is, by exerting a bit of leadership -- you will be able to quickly recruit a team of the brightest folks in class to start a company with you.

That's what happened to me. A year ago, I presented at a Winter Conference on Business Intelligence. My presentation was about a word: "psycho-analytics." I coined this term to reflect a growing trend towards the quantification of consumer and producer minds. In other words, "psycho-analytics" is a new breed of business intelligence. The exciting idea is that we could read minds by reading data.

So, at that time, I had coined a term but I had not constructed a niche. That part came next. My brother convinced me to buy psychoanalytix.com and to incorporate Psycho-Analytix LLC. Nine months ago, I had worked out the basic skeleton of a business and started talking about it with Tyler Hunt and Mark St Andre, two of the smartest quantitative thinkers in my department. They got excited about the idea and came on board as my first team members. We started taking on clients while I wrote my dissertation proposal.

Just after successfully proposing my dissertation, I met for a beer with Nathan Story who is also finishing up his PhD in psychology. Nathan has a reputation as a deep thinker and renaissance man -- an industrious intellectual. Over beers, we discussed our life experiences and our shared ambitions. Nathan also planned on becoming an entrepreneur after graduation. In fact, he planned on founding a business similar to Psycho-Analytix.

I admitted to Nathan that Psycho-Analytix would be honored to have him on our team. At this point, he was facing a choice about whether to become a partner or a competitor. I suggested that Nathan evaluate whether the brand he would create is very different from the emerging brand of Psycho-Analytix. If it is different, then he should probably start his own thing. If it is not very different, then we all benefit by joining forces. Nathan thought this over and decided to join the team.

That, in my mind, was a big turning point in my own professional identity. For some reason, it made me feel stronger to develop an equal partnership with someone that I respected so much. By partnering with another PhD / Entrepreneur, I began to believe in this whole idea of “PhD / Entrepreneur.”

To conclude, I have been addressing the path of a PhD / Entrepreneur. If you are considering this path, remember my four points of advice.

1. Decide if graduate school is right for you.
2. Complete your doctorate under a Professor-Inventor.
3. Earn the respect and trust of your fellow graduate students.
4. Forget about becoming an academic, focus on becoming an intellectual.

More importantly, remember the takeaway of this speech: Successful intellectuals, like successful entrepreneurs, are experts in niche construction. Constructing your intellectual niche is the work of your graduate school years and it culminates with a dissertation. Constructing your entrepreneurial niche will be the work of your postgraduate years and it will culminate when you are swimming in a new “pond” of your own creation. You will be floating your food in leisure. Your predators won’t have a chance against you. Your kids will grow up in safety. And you will have the peace of mind that you did not, in fact, forgo present income in order to forgo future income. In other words, you will be a success.

Thank you.