

Napster, Udacity, and the Academy

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Fifteen years ago, a research group called The Fraunhofer Institute announced a new digital format for compressing movie files. This wasn't a terribly momentous invention, but it did have one interesting side effect: Fraunhofer also had to figure out how to compress the soundtrack. The result was the *Motion Picture Experts Group Format 1, Audio Layer III*, a format you know and love, though only by its acronym, MP3.

The recording industry concluded this new audio format would be no threat, because quality mattered most. Who would listen to an MP3 when they could buy a better-sounding CD at the record store? Then Napster launched, and quickly became the fastest-growing piece of software in history. The industry sued Napster and won, and it collapsed even more suddenly than it had arisen.

If Napster had only been about free access, control of legal distribution of music would then have returned the record labels. That's not what happened. Instead, Pandora happened. Last.fm happened. Spotify happened. iTunes happened. Amazon began selling songs in the hated MP3 format.

How did the recording industry win the battle but lose the war? How did they achieve such a decisive victory over Napster, then fail to regain control of even legal distribution channels? They crushed Napster's organization. They poisoned Napster's brand. They outlawed Napster's tools. The one thing they couldn't kill was the story Napster told.

The story the recording industry used to tell us went something like this: "Hey kids, Alanis Morissette just recorded three kickin' songs! You can have them, so long as you pay for the ten mediocrities she recorded at the same time." Napster told us a different story. Napster said "You want just the three songs? Fine. Just 'You Oughta Know'? No problem. Every cover of 'Blue Suede Shoes' ever made? Help yourself. You're in charge."

The people in the music industry weren't stupid, of course. They had access to the same internet the rest of us did. They just couldn't imagine—and I mean this in the most ordinarily descriptive way possible—could not imagine that the old way of doing things might fail. Yet things did fail, in large part because, after Napster, the industry's insistence that digital distribution be as expensive and inconvenient as a trip to the record store suddenly struck millions of people as a completely terrible idea.

Once you see this pattern—a new story rearranging people's sense of the possible, with the incumbents the last to know—you see it everywhere. First, the people running the old system don't notice the change. When they do, they assume it's minor. Then that it's a niche. Then a fad. And by the time they understand that the world has actually changed, they've squandered most of the time they had to adapt.

It's been interesting watching this unfold in music, books, newspapers, TV, but nothing has ever been as interesting to me as watching it happen in my own backyard. Higher education is now being disrupted; our MP3 is the massive open online course (or MOOC), and our Napster is Udacity, the education startup.

We have several advantages over the recording industry, of course. We are decentralized and mostly non-profit. We employ lots of smart people. We have previous examples to learn from, and our core competence is learning from the past. And armed with these advantages, we're probably going to screw this up as badly as the music people did.

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A massive open online class is usually a series of video lectures with associated written materials and self-scoring tests, open to anyone. That's what makes them OOCs. The M part, though, comes from the world. As we learned from Wikipedia, demand for knowledge is so enormous that good, free online materials can attract extraordinary numbers of people from all

over the world.

Last year, [Introduction to Artificial Intelligence](#), an online course from Stanford taught by Peter Norvig and Sebastian Thrun, attracted 160,000 potential students, of whom 23,000 completed it, a scale that dwarfs anything possible on a physical campus. [As Thrun put it](#), “Peter and I taught more students AI, than all AI professors in the world combined.” Seeing this, he quit and founded Udacity, an educational institution designed to offer MOOCs.

The size of Thrun and Norvig’s course, and the attention attracted by Udacity (and similar organizations like Coursera, P2PU, and University of the People), have many academics worrying about the effect on higher education. The loudest such worrying so far has been [The Trouble With Online Education](#), a New York Times OpEd by Mark Edmundson of the University of Virginia. As most critics do, Edmundson focussed on the issue of quality, asking and answering his own question: “[C]an online education ever be education of the very best sort?”

Now you and I know what he means by “the very best sort”—the intimate college seminar, preferably conducted by tenured faculty. He’s telling the story of the liberal arts education in a selective residential college and asking “Why would anyone take an online class when they can buy a better education at UVA?”

But who faces that choice? Are we to imagine an 18 year old who can set aside \$250K and 4 years, but who would have a hard time choosing between a residential college and a series of MOOCs? Elite high school students will not be abandoning elite colleges any time soon; the issue isn’t what education of “the very best sort” looks like, but what the whole system looks like.

Edmundson isn’t crazy enough to argue that all college experiences are good, so he hedges. He tells us “Every memorable class is a bit like a jazz composition”, without providing an analogy for the non-memorable ones. He

assures us that “large lectures can also create genuine intellectual community”, which of course means they can also *not* do that. (He doesn’t say how many large lectures fail his test.) He says “real courses create intellectual joy,” a statement that can be accurate only as a tautology. (The MOOC Criticism Drinking Game: take a swig whenever someone says “real”, “true”, or “genuine” to hide the fact that they are only talking about elite schools instead of the median college experience.)

I was fortunate enough to get the kind of undergraduate education Edmundson praises: four years at Yale, in an incredible intellectual community, where even big lecture classes were taught by seriously brilliant people. Decades later, I can still remember my art history professor’s description of the Arnolfini Wedding, and the survey of modern poetry didn’t just expose me to Ezra Pound and HD, it changed how I thought about the 20th century.

But you know what? Those classes weren’t like jazz compositions. They didn’t create genuine intellectual community. They didn’t even create ersatz intellectual community. They were just great lectures: we showed up, we listened, we took notes, and we left, ready to discuss what we’d heard in smaller sections.

And did the professors also teach our sections too? No, of course not; those were taught by graduate students. Heaven knows what they were being paid to teach us, but it wasn’t a big fraction of a professor’s salary. The large lecture isn’t a tool for producing intellectual joy; it’s a tool for reducing the expense of introductory classes.

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Higher education has a bad case of cost disease (sometimes called Baumol’s cost disease, after one of its theorizers.) The classic example is the string quartet; performing a 15-minute quartet took a cumulative hour of musician time in 1850, and takes that same hour today. This is not true of the

production of food, or clothing, or transportation, all of which have seen massive increases in value created per hour of labor. Unfortunately, the obvious ways to make production more efficient—fewer musicians playing faster—wouldn't work as well for the production of music as for the production of cars.

An organization with cost disease can use lower paid workers, increase the number of consumers per worker, subsidize production, or increase price. For live music, this means hiring less-talented musicians, selling more tickets per performance, writing grant applications, or, of course, raising ticket prices. For colleges, this means more graduate and adjunct instructors, increased enrollments and class size, fundraising, or, of course, raising tuition.

The great work on college and cost-disease is Robert Archibald and David Feldman's [Why Does College Cost So Much?](#) Archibald and Feldman conclude that institution-specific explanations—spoiled students expecting a climbing wall; management self-aggrandizement at the expense of educational mission—hold up less well than the generic observation: colleges need a lot of highly skilled people, people whose wages, benefits, and support costs have risen faster than inflation for the last thirty years.

Cheap graduate students let a college lower the cost of teaching the sections while continuing to produce lectures as an artisanal product, from scratch, on site, real time. The minute you try to explain exactly why we do it this way, though, the setup starts to seem a little bizarre. What would it be like to teach at a university where a you could only assign books you yourself had written? Where you could only ask your students to read journal articles written by your fellow faculty members? Ridiculous. Unimaginable.

Every college provides access to a huge collection of potential readings, and to a tiny collection of potential lectures. We ask students to read the best works we can find, whoever produced them and where, but we only ask them to listen to the best lecture a local employee can produce that morning. Sometimes you're at a place where the best lecture your professor can give is

the best in the world. But mostly not. And the only thing that kept this system from seeming strange was that we've never had a good way of publishing lectures.

This is the huge difference between music and education. Starting with Edison's wax cylinders, and continuing through to Pandora and the iPod, the biggest change in musical consumption has come not from production but playback. Hearing an excellent string quartet play live in an intimate venue has indeed become a very expensive proposition, as cost disease would suggest, but at the same time, the vast majority of music listened to on any given day is no longer recreated live.

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Harvard, where I was fortunate enough to have a visiting lectureship a couple of years ago, is our agreed-upon Best Institution, and it is indeed an extraordinary place. But this very transcendence should make us suspicious. Harvard's endowment, 31 billion dollars, [is over three hundred times the median](#), and only one college in five has an endowment in the first place. Harvard also educates only about a tenth of a percent of the 18 million or so students enrolled in higher education in any given year. Any sentence that begins "Let's take Harvard as an example..." should immediately be followed up with "No, let's not do that."

This atypical bent of our elite institutions covers more than just Harvard. The top 50 colleges on the [US News and World Report](#) list (which includes most of the ones you've heard of) only educate something like 3% of the current student population. The entire list, about 250 colleges, educates fewer than 25%.

The upper reaches of the US college system work like a potlatch, those festivals of ostentatious giving. The very things the US News list of top colleges prizes—low average class size, ratio of staff to students—mean that any institution that tries to create a cost-effective education will move *down*

the list. This is why most of the early work on MOOCs is coming out of Stanford and Harvard and MIT. As Ian Bogost says, [MOOCs are marketing](#) for elite schools.

Outside the elite institutions, though, the other 75% of students—over 13 million of them—are enrolled in the four thousand institutions you *haven't* heard of: Abraham Baldwin Agricultural College. Bridgerland Applied Technology College. The Laboratory Institute of Merchandising. When we talk about college education in the US, these institutions are usually left out of the conversation, but Clayton State educates as many undergraduates as Harvard. Saint Leo educates twice as many. City College of San Francisco enrolls as many as the entire Ivy League combined. These are where most students are, and their experience is what college education is mostly like.

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The fight over MOOCs isn't about the value of college; a good chunk of the four thousand institutions you haven't heard of provide an expensive but mediocre education. For-profit schools like Kaplan's and the University of Phoenix enroll around one student in eight, but [account for nearly half of all loan defaults](#), and the vast majority of their enrollees fail to get a degree even after six years. Reading the academic press, you wouldn't think that these statistics represented a more serious defection from our mission than helping people learn something about Artificial Intelligence for free.

The fight over MOOCs isn't even about the value of *online* education. Hundreds of institutions already offer online classes for credit, and half a million students are already enrolled in them. If critics of online education were consistent, they would believe that the University of Virginia's [Bachelor of Interdisciplinary Studies](#) or [Rutger's MLIS degree](#) are abominations, or else they would have to believe that there is a credit-worthy way to do online education, one MOOCs could emulate. Neither argument is much in evidence.

That's because the fight over MOOCs is really about the story we tell

ourselves about higher education: what it is, who it's for, how it's delivered, who delivers it. The most widely told story about college focuses obsessively on elite schools and answers a crazy mix of questions: How will we teach complex thinking and skills? How will we turn adolescents into well-rounded members of the middle class? Who will certify that education is taking place? How will we instill reverence for Virgil? Who will subsidize the professor's work?

MOOCs simply ignore a lot of those questions. The possibility MOOCs hold out isn't replacement; anything that could replace the traditional college experience would have to work like one, and the institutions best at working like a college are already colleges. The possibility MOOCs hold out is that the educational parts of education can be unbundled. MOOCs expand the audience for education to people ill-served or completely shut out from the current system, in the same way phonographs expanded the audience for symphonies to people who couldn't get to a concert hall, and PCs expanded the users of computing power to people who didn't work in big companies.

Those earlier inventions systems started out markedly inferior to the high-cost alternative: records were scratchy, PCs were crashy. But first they got better, then they got better than that, and finally, they got so good, for so cheap, that they changed people's sense of what was possible.

In the US, an undergraduate education used to be an option, one way to get into the middle class. Now it's a hostage situation, required to avoid falling out of it. And if some of the hostages having trouble coming up with the ransom conclude that our current system is a completely terrible idea, then learning will come unbundled from the pursuit of a degree just as as songs came unbundled from CDs.

If this happens, Harvard will be fine. Yale will be fine, and Stanford, and Swarthmore, and Duke. But Bridgerland Applied Technology College? Maybe not fine. University of Arkansas at Little Rock? Maybe not fine. And Kaplan College, a more reliable producer of debt than education? Definitely not fine.

Udacity and its peers don't even pretend to tell the story of an 18-year old earning a Bachelor's degree in four years from a selective college, a story that only applies to a small minority of students in the US, much less the world. Meanwhile, they try to answer some new questions, questions that the traditional academy—me and my people—often don't even recognize as legitimate, like “How do we spin up 10,000 competent programmers a year, all over the world, at a cost too cheap to meter?”

Udacity may or may not survive, but as with Napster, there's no containing the story it tells: “It's possible to educate a thousand people at a time, in a single class, all around the world, for free.” To a traditional academic, this sounds like crazy talk. Earlier this fall, a math instructor writing under the pen name Delta enrolled in Thrun's [Statistics 101](#) class, and, after experiencing it first-hand, concluded that the course was

...amazingly, shockingly awful. It is poorly structured; it evidences an almost complete lack of planning for the lectures; it routinely fails to properly define or use standard terms or notation; it necessitates occasional massive gaps where “magic” happens; and it results in nonstandard computations that would not be accepted in normal statistical work.

[Delta posted ten specific criticisms](#) of the the content (Normal Curve Calculations), teaching methods (Quiz Regime) and the MOOC itself (Lack of Updates). About this last one, Delta said:

So in theory, any of the problems that I've noted above could be revisited and fixed on future pass-throughs of the course. But will that happen at Udacity, or any other massive online academic program?

The very next day, [Thrun answered that question](#). Conceding that Delta “points out a number of shortcomings that warrant improvements”, Thrun

detailed how they were going to update the class. Delta, to his credit, [then noted that Thrun had answered several of his criticisms](#), and went on to tell a depressing story of a fellow instructor at his own institution who had failed to define the mathematical terms he was using despite student requests.

Tellingly, when Delta was criticizing his peer, he didn't name the professor, the course, or even his institution. He could observe every aspect of Udacity's Statistics 101 (as can you) and discuss them in public, but when criticizing his own institution, he pulled his punches.

Open systems are open. For people used to dealing with institutions that go out of their way to hide their flaws, this makes these systems look terrible at first. But anyone who has watched a piece of open source software improve, or remembers the Britannica people throwing tantrums about Wikipedia, has seen how blistering public criticism makes open systems better. And once you imagine educating a thousand people in a single class, it becomes clear that open courses, even in their nascent state, will be able to raise quality and improve certification faster than traditional institutions can lower cost or increase enrollment.

College mottos run the gamut from Bryn Mawr's *Veritatem Dilexi* (I Delight In The Truth) to the Laboratory Institute of Merchandising's *Where Business Meets Fashion*, but there's a new one that now hangs over many of them: *Quae Non Possunt Non Manent*. Things That Can't Last Don't. The cost of attending college is rising above inflation every year, while the premium for doing so shrinks. This obviously can't last, but no one on the inside has any clear idea about how to change the way our institutions work while leaving our benefits and privileges intact.

In the academy, we lecture other people every day about learning from history. Now it's our turn, and the risk is that we'll be the last to know that the world has changed, because we can't imagine—really cannot imagine—that story we tell ourselves about ourselves could start to fail. Even when it's true. Especially when it's true.