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Subject: FW: universal exponent for cities and companies (Sante Fe thesis)

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You might like this as well.

Information on the Internet seems like a city. To illustrate, part of what I read this morning is summarized below. 100% of what I read was found via third party aggregators I trust (i.e., zero visits to page one of the source).

Why Science Majors Change Their Minds (It's Just So Darn Hard) "...Studies have found that roughly 40 percent of students planning engineering and science majors end up switching to other subjects or failing to get any degree. That increases to as much as 60 percent when pre-medical students, who typically have the strongest SAT scores and high school science preparation, are included, according to new data from the University of California at Los Angeles. That is twice the combined attrition rate of all other majors. ..." http://www.nytimes.com/2011/11/06/education/edlife/why-science-majors-change-their-mind-its-just-so-darn-hard.html?_r=2&pagewanted=all?src=tp

"Teachers don't scale," I remember Sal Khan saying to me when I interviewed him last year. What can scale, he argues, is the infrastructure for content delivery. And that means you just need a handful of good lecturers' record their lessons; the Internet will take care of the rest. But online instruction clearly isn't enough, and as "blended learning" becomes the latest buzzword — that is, a blend of offline and computer-mediated/online instruction — Khan Academy is now eyeing building its own school. The money from the O'Sullivan Foundation will go towards developing a "testbed for physical programs and K-12 curricula," including an actual physical Khan Academy school. This will begin in June 2012 as a series of summer camps. "The school of the future will not resemble the school of today," Khan says. "In the past, the assembly-line, lecture-homework-exam model existed because that's what was possible in the no-tech and low-tech classrooms of their day." His team now have \$5 million to take that lecture-homework-exam model into the high-tech classroom... or something. <http://www.hackeducation.com/2011/11/04/khan-academy-gets-5-million-to-expand-faculty-platform-to-build-a-physical-school>

Instead of teaching physics or mathematics as we teach second languages, then blaming the victims for not doing well, and expecting them to internalize the blame (an example of the [Stockholm syndrome](#)), **why not use physics and mathematics to ask and answer questions about the world?** Rather than starting the course with "motion in a straight line at constant speed" (it's hard to imagine a topic more dull or, alas, more typical), we can use physics concepts such as force and energy to estimate the [gas mileage of a 747 by dropping coffee filters](#)—thereby giving the concepts depth and meaning. <http://www.freakonomics.com/2011/11/02/the-way-we-teach-math-and-language-is-wrong/>

The global output of heat-trapping **carbon dioxide jumped last year by the biggest amount on record**, the U.S. Department of Energy calculated, a sign of how feeble the world's efforts are at slowing man-made global warming. The new figures for 2010 mean that levels of greenhouse gases are higher than the worst-case scenario outlined by climate experts just four years ago. "The more we talk about the need to control emissions, the more they are growing," said John Reilly, co-director of MIT's Joint Program on the Science and Policy of Global Change. The world pumped about 564 million more tons of carbon into the air in 2010 than it did in 2009. That's an increase of 6%. That amount of extra pollution eclipses the individual emissions of all but three countries — China, the United States and India, the world's top producers of greenhouse gases. <http://www.latimes.com/news/nationworld/world/la-na-global-warming-20111105,0,4368035.story>

Students who graduated from college in 2010 with **student loans owed an average of \$25,250, up 5%** from the previous year. The average debt - once again the highest on record - came as the class of 2010 faced an unemployment rate for new college graduates of 9.1%, the highest in recent years. ... some people had expected the jump "to be even higher because of the economic downturn," but that larger grants had helped {a high tuition high discount model = progress since taxation of the rich} About two-thirds of the class of 2010 graduated with student debt. The average amount of debt would be even higher if the report included profit-making schools, where almost all students take out loans and, according to federal data, borrow about 45 percent more than students at nonprofits. <http://mobile.nytimes.com/article?a=862403&f=58>

Emanuel Derman: in Models. Behaving. Badly. "one must recognize that there are no genuine theories in finance. In physics, Newton's laws and Maxwell's equations are facts of nature, entirely equivalent and identical to the phenomena of mechanics and electromagnetism that they describe. In finance, **the Efficient Market Model's assumption that stock prices behave like smoke diffusing through a room is not even remotely a fact.**

<http://blogs.reuters.com/great-debate/2011/11/03/the-physics-of-an-economic-crisis/>

Three articles on the math of financial transaction taxes:

<http://ftalphaville.ft.com/blog/2011/11/03/725871/would-you-feel-three-basis-points/>

<http://www.economist.com/node/21536784>

<http://finance.fortune.cnn.com/2011/11/04/financial-transaction-tax/>

UN released its **new edition of its human development report** on November 2nd.

<http://www.economist.com/blogs/dailychart/2011/11/human-development-index?>

[fsrc=scn/tw/te/dc/deconstructingdevelopment](http://www.economist.com/blogs/dailychart/2011/11/human-development-index?fsrc=scn/tw/te/dc/deconstructingdevelopment)

A mathematician and former cryptographer at Bell Labs named Andrew Odlyzko ... has proposed a "gullibility index" that would use social media like Twitter to track such factors as innumeracy and diversity of opinions, which could signal that investors are more vulnerable to mania. The index isn't yet live..... "I'm very skeptical whether anyone can predict bubbles reliably," says Mr. Odlyzko. "It's an arms race: **Anytime you come up with a bubble detector, people will try to get around it.**" [http://online.wsj.com/article/SB10001424052970204621904577017960729384948.html?](http://online.wsj.com/article/SB10001424052970204621904577017960729384948.html?mod=WSJ_hp_MIDDLENexttoWhatsNewsTop)

[mod=WSJ_hp_MIDDLENexttoWhatsNewsTop](http://online.wsj.com/article/SB10001424052970204621904577017960729384948.html?mod=WSJ_hp_MIDDLENexttoWhatsNewsTop)

What If Middle-Class Jobs Disappear?... Without ruling out a role for aggregate demand or for the regulatory environment, I wish to suggest that structural change is an important factor in the current rate of high unemployment. The economy is in a state of transition, in which the middle-class jobs that emerged after World War II have begun to decline. As Erik Brynjolfsson and Andrew McAfee put it in a recent e-book *Race Against the Machine*: The root of our problems is not that we're in a Great Recession, or a Great Stagnation, but rather that we are in the early throes of a Great Restructuring. <http://american.com/archive/2011/november/what-if-middle-class-jobs-disappear>

Tom Bartlett at the *Chronicle of Higher Education*, outlining the techniques of the Dutch psychology professor Diederik Stapel who has admitted fabricating data, makes scientific fraud sound a lot like Madoff-style financial deception: both include social networking, stonewalling disclosure, indignation when questioned. **The Ponzi Schemer and data fabricator share with other forms of confidence artists a gift for recognizing the stories that people would like to hear**, for example that messy surroundings increase racial prejudice against their residents. Bernard Madoff's story was tailored precisely to skeptical investors who questioned others' claims of unusually high yields. In a just universe, shouldn't it be possible to achieve more modest goals consistently? That's a plausible but wrong hypothesis, and some (though not all) experienced investors fell for it.

There's another parallel: both Bernard Madoff's and Diederik Stapel's numbers were too good.

<http://www.theatlantic.com/business/print/2011/11/how-scientific-fraud-is-like-ponzi-finance/247885/>

[This is what I call the Starbucks principle at work] "...Now with retirement it's especially difficult because we not only don't know exactly what we're giving up, it's also far away in the future. That makes it very, very difficult to think about. It's called hyperbolic discounting — we just care less dramatically about the future so not only is it hard for us to understand what we are giving up, it's also really, really delayed. ... Money is difficult. And money is difficult to deal with now. Every time we deal with money — we buy a cup of coffee or a computer or car — we need to think about what we are giving up in the future for this pleasure. We need to think about the opportunity cost. But **it's very hard to think about the opportunity cost because there are so many different things we could get with money.** So what exactly we giving up is very, very hard, very hard to think about. ... When we pushed them and said, look something has to give, most people said that if they buy a Toyota then they can't buy a Honda. So they were making a substitution in the same time frame and in the same category. But what they should have been doing is making substitutions in a different time frame with different categories, such as saying that the car represents something like one week's vacation for the next four years. Or it's seven hundred lattes and so on. But people have a very hard time doing that. So we often don't. <http://rpseawright.wordpress.com/2011/11/01/five-good-questions-with-dan-ariely/>

["Can Apparent Superluminal Neutrino Speeds Be Explained as a Quantum Weak Measurement?,"](http://arxiv.org/abs/1111.0545) .. Here is the paper's abstract in its entirety: "Probably not".

and an essay on why blogging and not just papers is essential to inject economics into policy:

<http://publicsphere.ssrc.org/thoma-new-forms-of-communication-and-the-public-mission-of-economics/>

and Nathan on the science of cooking: <http://edge.org/conversation/on-the-science-of-cooking> ;-)