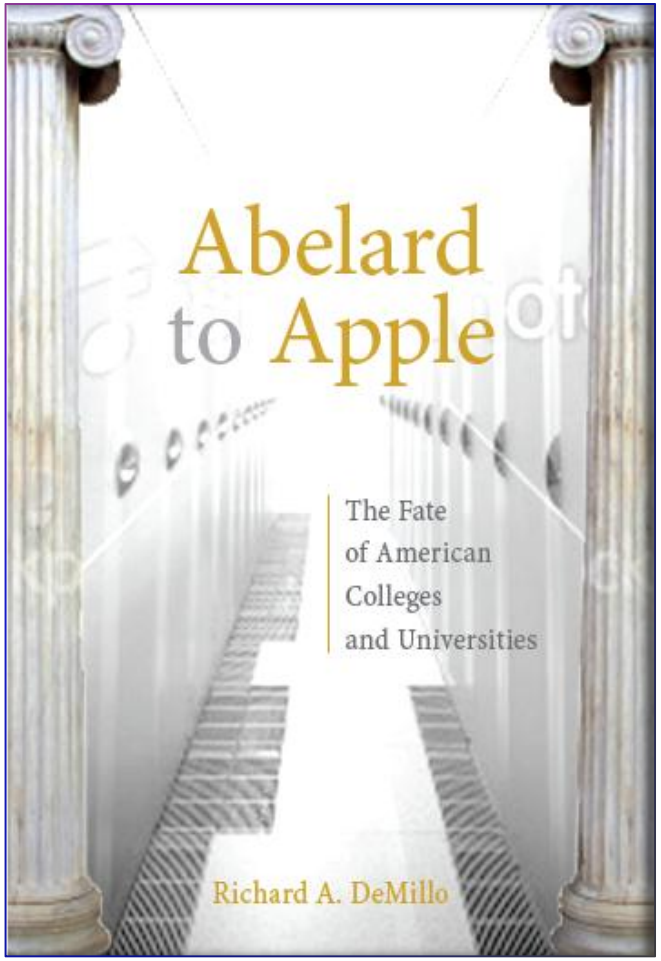


Abelard to Apple: The Fate of American Colleges and Universities

Richard DeMillo*

MIT Press, 2011

* Georgia Institute of Technology and Qatar Computing Research Institute

What does the title mean?

Peter Abelard (cir 1100)

Disruptions that do not favor the current way Universities work

Apple's ITunesU (cir 2002)

In early November 2009, the University of California at Berkeley -- the number one ranked public university in the country -- raised its tuition by thirty-two percent, prompting massive student protests of increases that have tripled the cost of university education over the past decade. For the placard-carrying students, who think they have been locked out of public education in California because they cannot afford it, the university experience has changed. The Berkeley laboratories where Nobel Prize winners once conducted research are now dirty and decaying because budget cuts have made it impossible to properly maintain them. These are images that prompted the New York Times to write

…Among students and faculty alike there is a pervasive sense that the [tuition] increases and the deep budget cuts are pushing the university into decline

Source: New York Times

Most American colleges and universities -- the two thousand or so institutions that are virtually anonymous but which enroll eighty percent of the nations college-age students are under even more intense pressure than prestigious Berkeley.

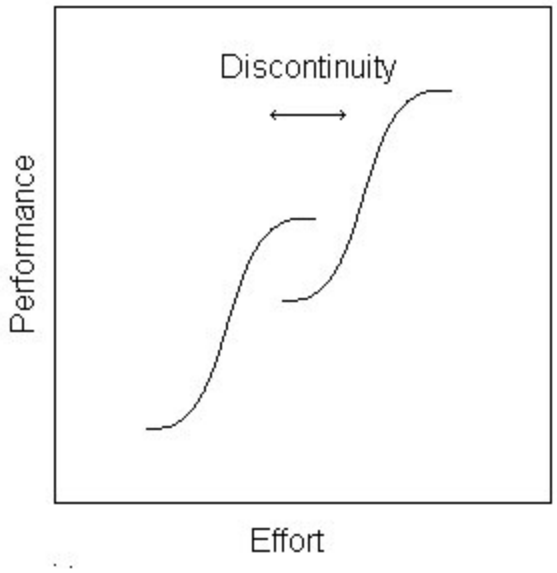
The future looks very different for these two thousand. India's twenty-seven thousand new universities, Apple's ITunesU™ and the hundreds of virtual universities that offer online courses are vanguards of a virtual explosion in global higher education, a market that is desperately trying to keep up with the raised expectations of the half of the world's population that has joined the free market economies in the last generation and wants access to education to improve lives and create wealth. Higher education is, suddenly, a rapidly growing marketplace with many alternatives. There are thousands more institutions of higher learning in the United States than can be supported. Many will not be able to compete with cheaper, nimbler, and frequently more effective alternatives.

Traditional American universities are no longer gatekeepers…

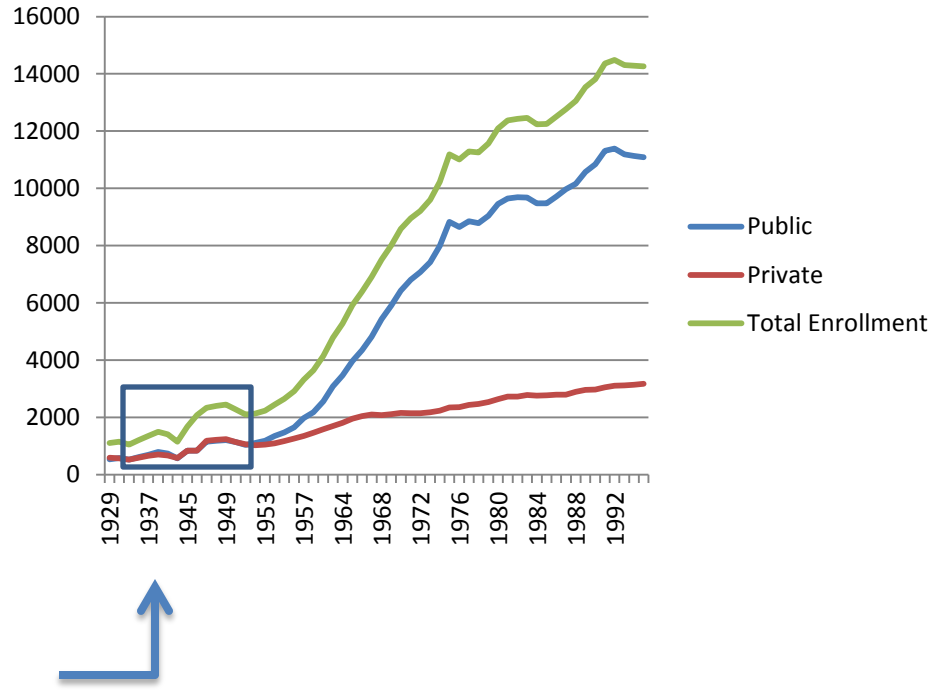
- Open Learning
- More proprietary universities (15% growth)
- India 27,000 new universities over the next ten years
- Ed-X
- $300M in early stage investments
  - Coursera
  - Udacity
  - Minerva

Traditional Universities are the incumbents…

- Encyclopedias
- Rail transport
- Mobile discount operators
- Catalog stores
- Mainframe computers
- Minicomputers
- Navigational maps
- X-ray imaging
- Netscape
- Vertically integrated steel mills
- Cathode ray tubes
- Telegraphy
- Sailing ships
- Offset printing
- Chemical photography
- Newspapers
- Book selling
- Universities



The structure of (American) higher education was decided before we knew what it was going to do….



All the experiments were done by this time

Where are the New Experiments in higher education?

- The United States has not added capacity since 1960 (4x increase in students)
- Lots of past experiments
  - Dozens in medieval Europe
    - Peter Abelard (cir 1100)
    - Jesuits (cir 1600)
  - Hundreds in colonial America
    - University of Virginia (cir 1800)
    - Williams College (1820)
  - Thousands in post Civil War US
    - Harvard's disappearing requirements (1870)
    - US Land Grant Universities (1860)
  - Tens of thousands today
    - Open University, UK
    - Kahn Academy
    - India: 35,000 new colleges and universities

What are the Implications?

- Elite universities get to hand-pick their students
- A few less-selective universities get very large
- Everyone else fights over the remaining students
- Costs go up for everyone

Three Tiers

- Elite (70-75)
  - 1.5-2 million students
  - High Prestige
  - Large Endowment
  - Ability to set its own agenda
  - Depends on virtuous cycle: Student →Professor → Research → Wealth →Students
- Middle (thousands)
  - 14 million students
  - Variable prestige
  - Follows the Elite
- Proprietary (hundreds)
  - 4-5 million students
  - Low Prestige
  - Large Endowment
  - Ability to set its own agenda
  - Depends on satisfied students

Differences between American and Italian Universities

American

- Most students first generation to attend
- Most students career-driven
- Multiversity
- Many private universities
- Tuition
- Declining public confidence

Italian

- Most students from families with parents who attended
- Most students interest-driven
- Single mission
- Private universities rare
- Tuition-free
- Declining public confidence

Economic Reality #1: Higher Education is a Multi-Sided Market

Single Sided Market

- A “customer” who is willing to pay for value
- A “business” (producer of goods and services) whose costs can be controlled
- An optimal price that is determined by marginal cost

A Multi Sided Market

- Many stakeholders who have different, often competing needs
- Portfolios of goods and services with connected costs and cross-subsidies
- A platform

Economic Reality #2: Bypass Economies

Signs that boundaries are being destroyed

- Your services are desired by many, affordable to few
- Trust between you and your stakeholders has fractured
- You have a concentrated business model with high fixed costs that could be distributed
- Your organization can be replaced with outside networks with hidden assets
- You don't have all the assets that you need
- Your stakeholders have needs that you haven't imagined and have to way to learn about

Markets find a bypass

Economic Reality #3: In a marketplace with many alternatives, the only way to survive is to have

- An unassailable brand, or
- The best price, or
- The best value proposition

- Only the Elite have global brands
- The Middle wastes money
- The Middle has misjudged its value

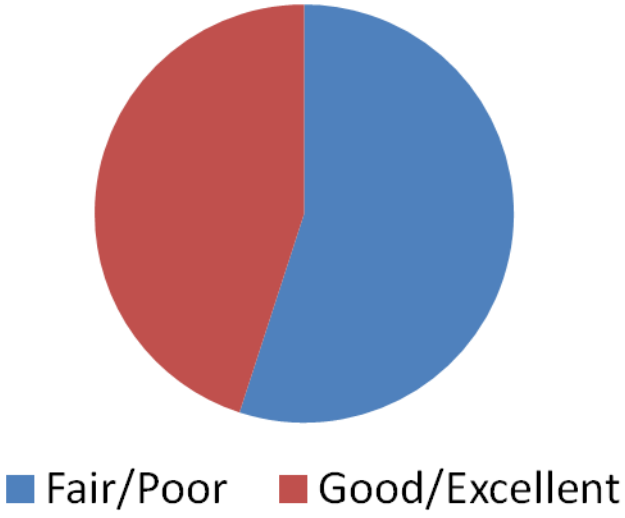
BRAND

	1910	1925	2008
1	Harvard University	University of Chicago	Harvard University, Princeton University
2	Princeton University	Harvard University	
3	Yale University	Columbia University	Yale University
4	University of Penn	University of Wisconsin	California Tech, MIT, Stanford University , University of Penn
5	Stanford University	Yale University	
6	Columbia University	Princeton University	
7	Cornell University	Johns Hopkins	
8	Johns Hopkins	University of Mich	Columbia University University of Chicago
9	University of Chicago	UC Berkeley	
10	UCBerkeley	Cornell University	Duke University
11	University of Michigan	University of Illinois	Dartmouth College
12	University of Wisconsin	University of Penn	Northwestern , Washington Univ
13	University of Illinois	University of Minnesota	
14	University of Minnesota	Stanford University	Johns Hopkins
15	NA	Ohio State University	Cornell University
16	NA	University of Iowa	Brown University
17	NA	Northwestern	Emory University , Rice University, Vanderbilt University
18	NA	University of NC	
19	NA	Indiana University	
20	NA	NA	Notre Dame

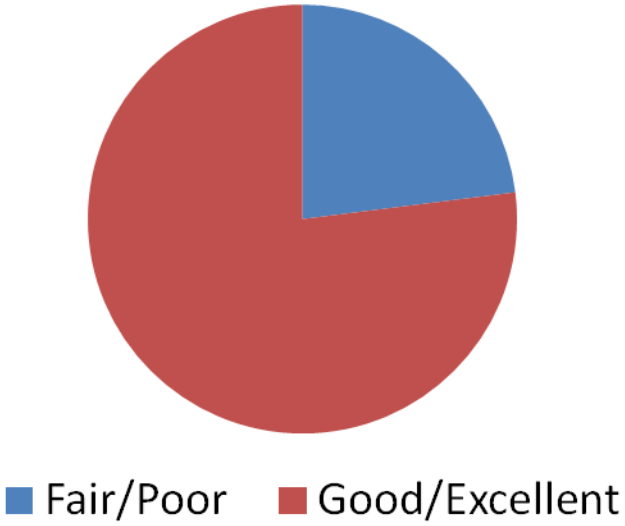
Public

Disconnect

Public Perception of Value



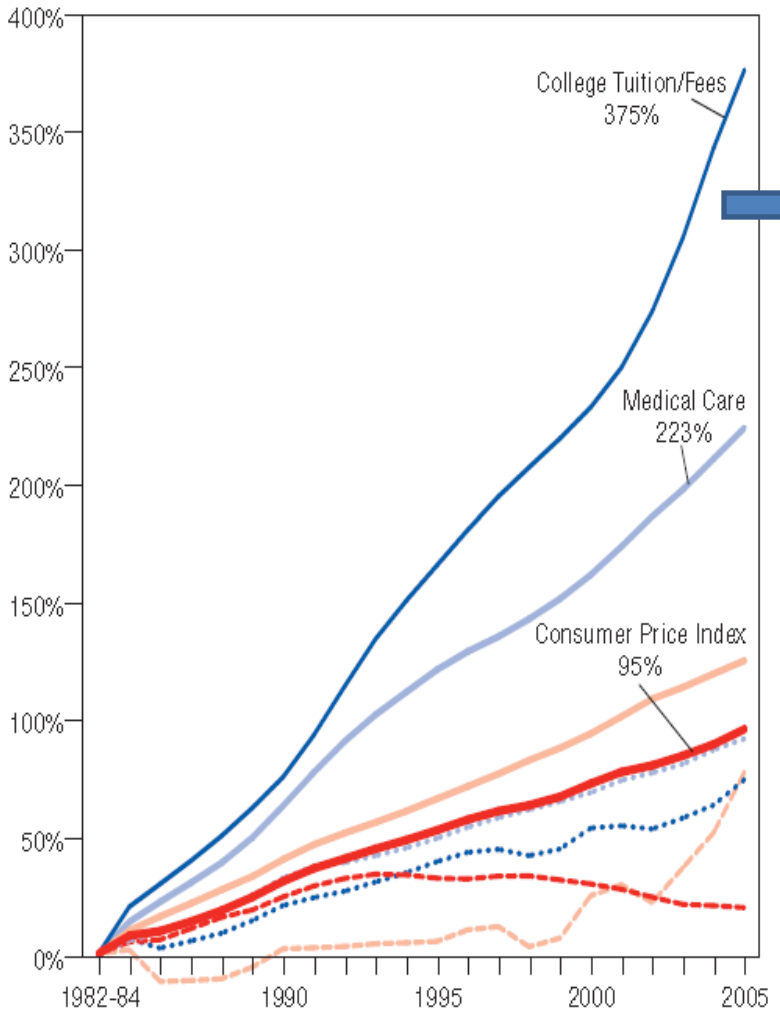
Presidents Perception of Value



Source:
"Is College Worth It? College Presidents, Public Assess Value, Quality and Mission of Higher Education," Pew Research Center: Social and Demographic Trends, Washington, DC (http://pewsocialtrends.org)

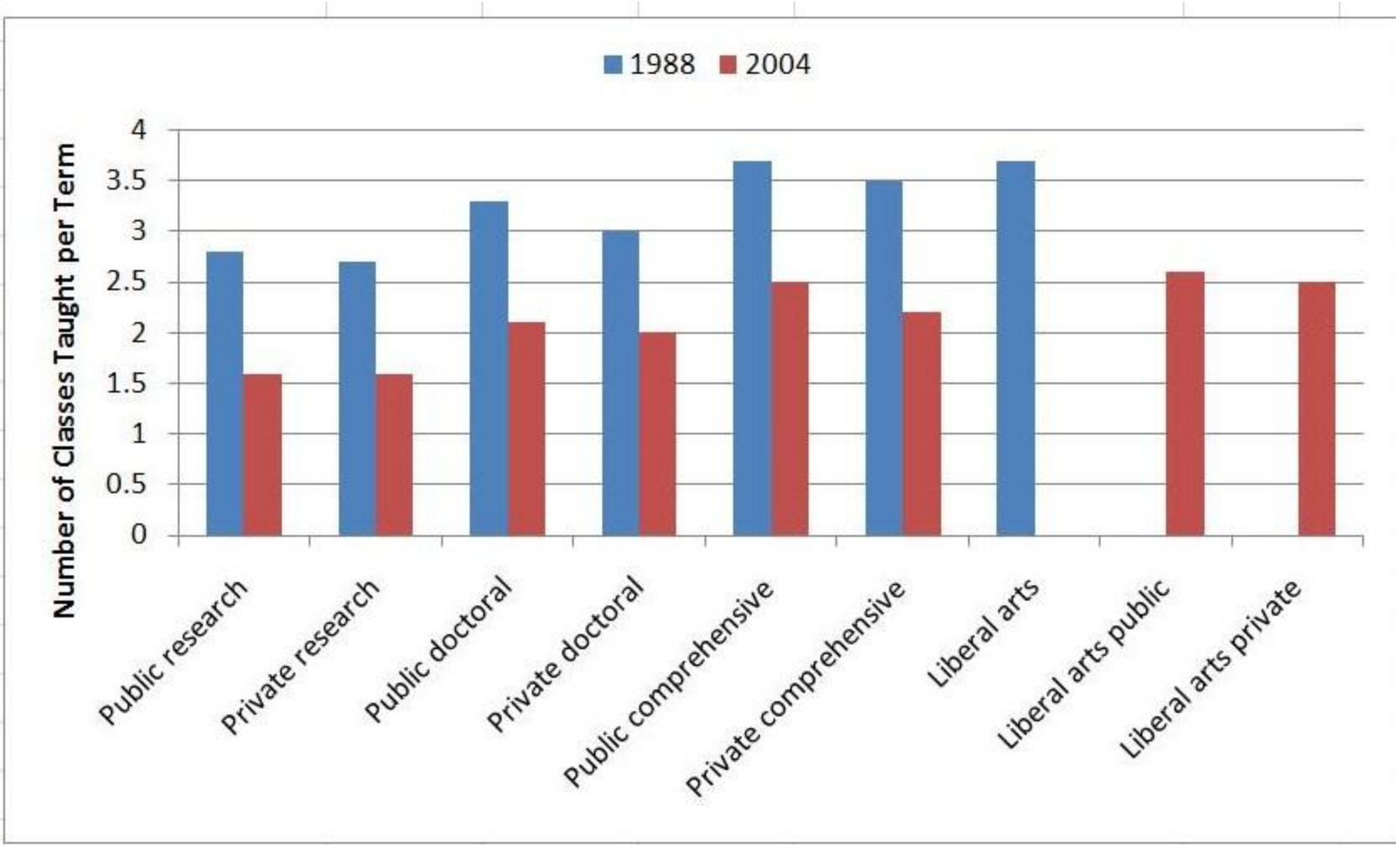
PRICE

Cost of Higher Education 1980-2005



Little of this ends up in the classroom

Mission Creep



Source: National Study of Postsecondary Faculty, 1988-2004

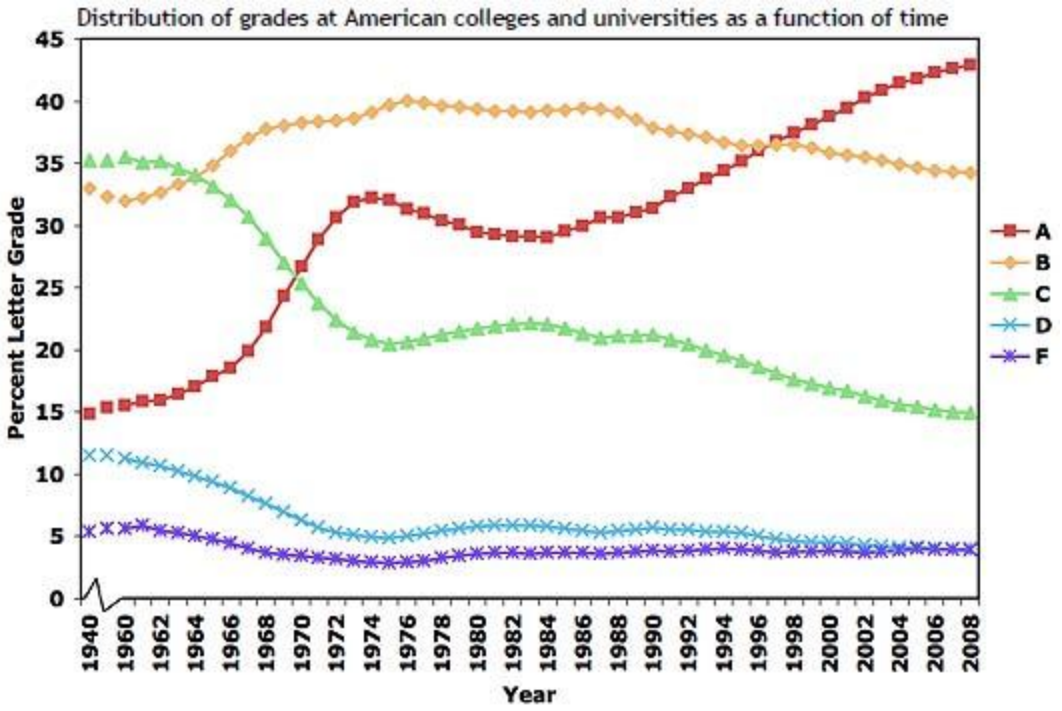
Faculty classroom productivity

Category	Campuses	Courses per Semester
Research University I	Chapel Hill, NC State, Greensboro, A&T	2
Doctoral Universities	East Carolina, Charlotte	2.5
Master's	Central, Western, Appalachian, Wilmington, Pembroke, Fayetteville	3
Baccalaureate I	Asheville	4
Baccalaureate II	Elizabeth City, Winston-Salem, School of the Arts	4

Source: Jay Schalin "A Common-Sense Look at UNC Faculty Workloads", Pope Center for Higher Education

VALUE

Grade Inflation

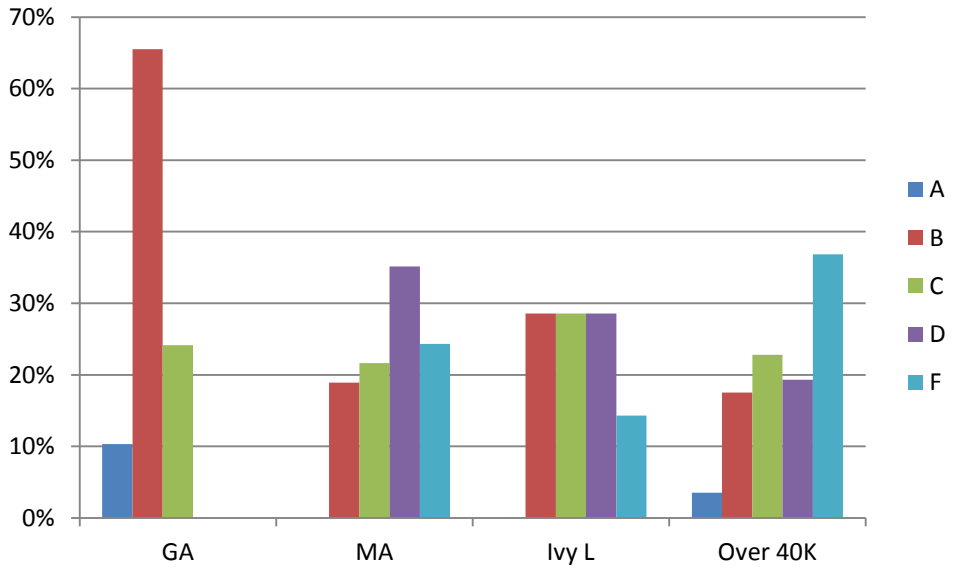


Source: Where A is Ordinary
Stuart Rojstaczer and Christopher Healy
Teachers College Record, 2011

The Value of a Degree

- What's it worth?
- What is being taught?
- What do you learn?

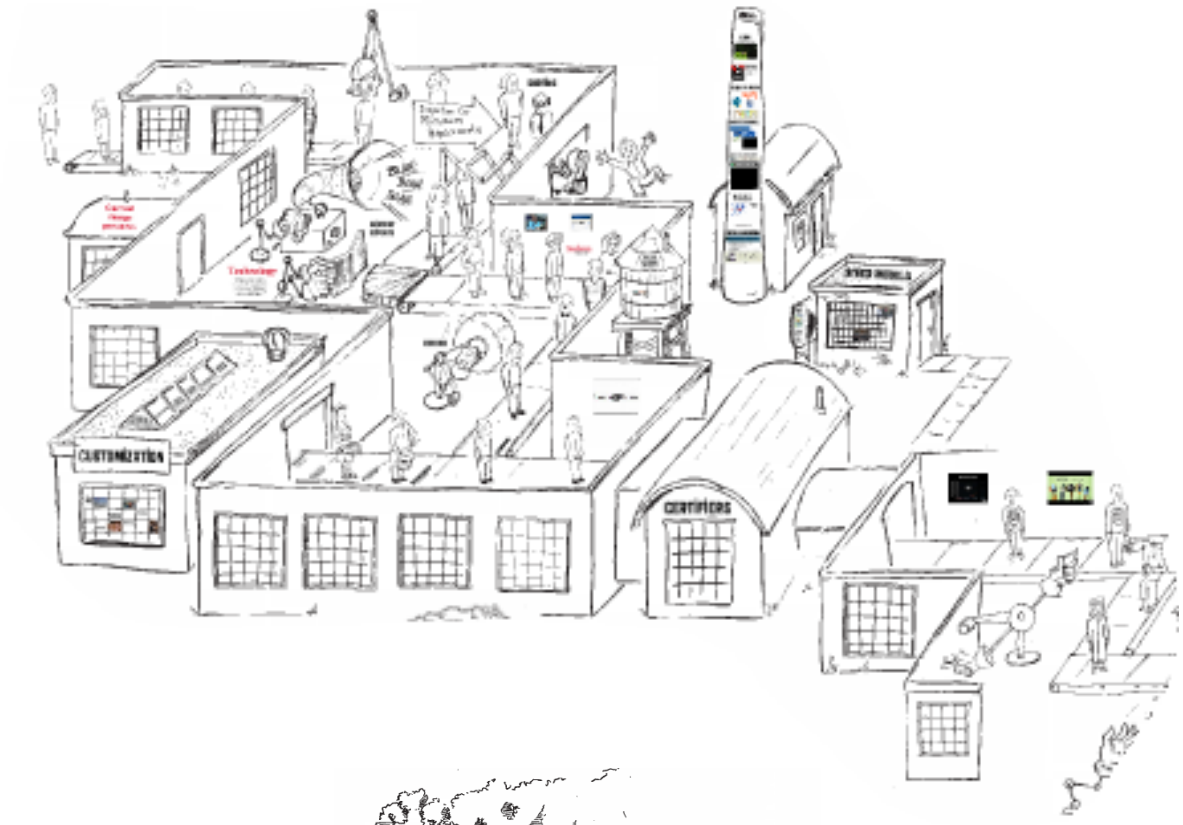
- Payscale.com
- WhatDoYouLearn.com
- "Academically Adrift"

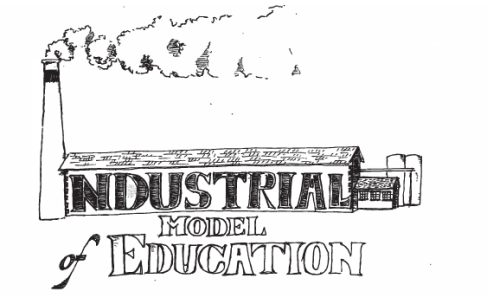


Source: American Council of Trustees and Alumni, 2011

About Accreditation

- Historical Roots
- Factory Model
- Scalability
- Science
- Technology
- Cost





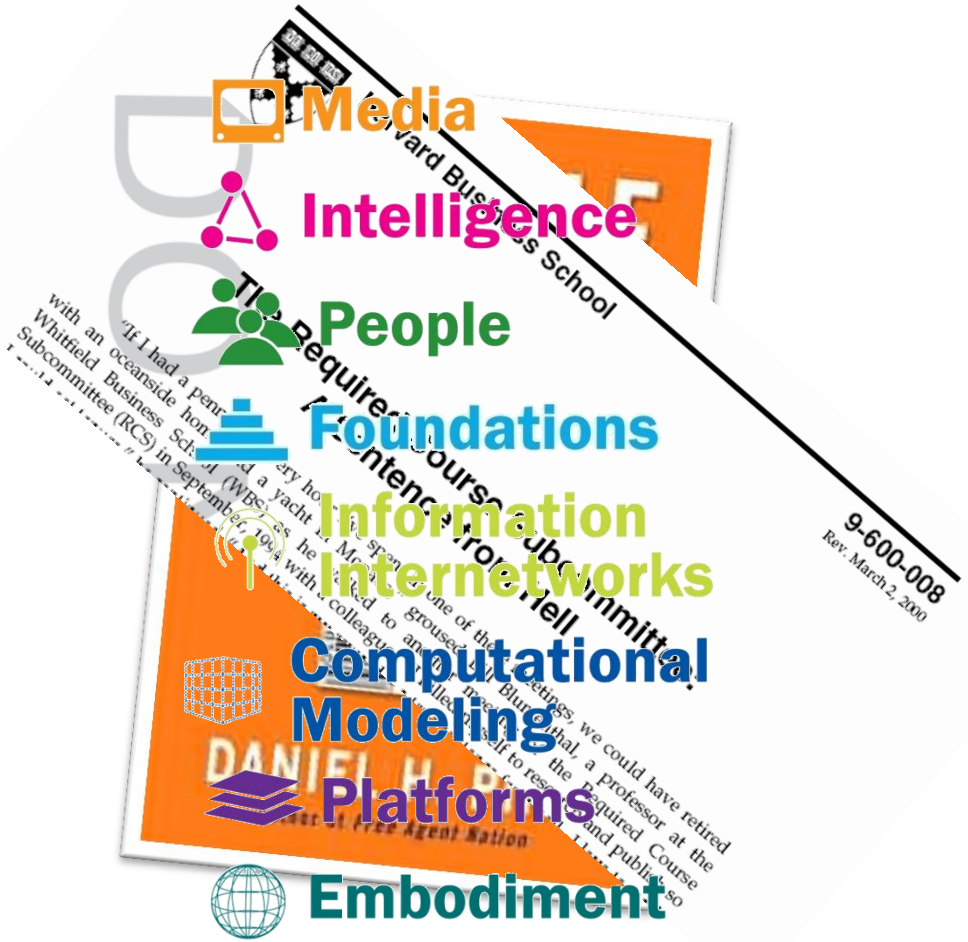
Source: Maria Andersen
http://prezi.com/irqborz3hmd2/levers-of-change-in-higher-education/

THE “THREADS” EXPERIMENT

GEORGIA TECH UNDERGRADUATE CS CURRICULUM IN 2002

…hard to do more than tinker

- Think horizontally
  - The Flat World
- Remove
  - "The curse of the core curriculum"
- Add student-centrism
  - a Threaded curriculum



Reverberation

- **Resonates**
  - Parents
  - Students
  - Employers
- **Engages faculty**
- **Influences**
  - Peers
  - Institute
  - CRA

28 Combinations

Thread 1	Thread 2	Outcome Examples
Embodiment	Foundations	Performance bounds for robotic planning algorithms
Embodiment	Informational Internetworks	Mobile Computing
Embodiment	Intelligence	Robotics
Embodiment	Media	Developing computer games for handheld devices
Embodiment	People	Human-robot interaction
Embodiment	Platforms	Small, power-and CPU-limited devices
Foundations	Informational Internetworks	Security and Data Extraction
Foundations	Intelligence	Machine Learning
Foundations	Media	Video compression and encoding
Foundations	People	Computer science education research
Foundations	Platforms	Distributed high-performance computing algorithms
Informational Internetworks	Intelligence	Multimedia Distribution
Informational Internetworks	Media	High-performance database systems
Informational Internetworks	People	Computer security
Informational Internetworks	Platforms	Distributing secure information to handhelds and cell-phones
Intelligence	Media	Adaptive Entertainments
Intelligence	People	Presenting intelligent search/analysis results in human-readable terms
Intelligence	Platforms	Adaptive levels of intelligence based on available computing capabilities
Media	People	Visualization of high-bandwidth data streaming
Media	Platforms	Web Developer
Modeling	Embodiment	Simulating robots in hazardous settings
Modeling	Foundations	Efficient algorithms for simulating complex phenomena (e.g., weather)
Modeling	Informational Internetworks	Bioinformatics
Modeling	Intelligence	Simulation environments for testing intelligent algorithms
Modeling	Media	Animation
Modeling	People	Adaptive Interfaces
Modeling	Platforms	Distributed simulations
People	Platforms	Developing programming environments

WHAT IS "SUCCESS" IN THE 21ST CENTURY?

Institutional Envy

- Less prestigious universities chase more prestigious ones
  - Private universities chase Harvard
  - Public universities chase Michigan
  - Technical universities chase MIT
- How do you get to be more prestigious?
  - How selective are you?
  - How much do you spend per student?
  - How predictable are your outcomes?

Who will succeed over the next 100 years?

Defining Value

- Not based on institutional envy
- Focus on differentiation
- Establish brand
- Recognize weaknesses
- Embrace openness

Architecting Form

- Balance faculty-centrism and student-centrism
- Create the best technology
- Cut costs in half
- Meaningful measures of success
- Societal success

Some Subversive Ideas

- Interchange the roles of lectures and homework?
- The gameification of education: rewarding "failure" but demanding mastery
- Replacing accreditation with….
- Value-based metrics
- Financial transparency
- Non-core activities pay their own way