MOOCs and Beyond

Universities **WILL** Change the World

-Everyone wants universities to change,
  but exactly how is not so clear

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Distinguished Professor
  of Higher Education, Emerging Technologies, and Innovation.

RPI 13th Annual Colloquium on Teaching & Learning
"Innovations in eLearning – MOOCs and Beyond"

University of Massachusetts
Amherst · Boston · Dartmouth · Lowell · Worcester · UMassOnline

The Paradox

- At the same time that universities are facing extraordinary financial pressures due to a collapse of state revenue and endowments
- Everyone is looking to universities to lead us out of the economic decline
- Creating futures for students and communities
- And solving social challenges like
  - improving college readiness
  - Reducing disparities (racial, economic, gender,etc)
  - Increasing graduation rates
  - Attracting students into STEM fields
  - Better matching workforce needs

President Obama's Goal

- To be first the world by 2020 in the proportion of college graduates.
  - -Address to Congress on Feb. 24, 2009.

- The US was tied for 6th place at 30% according to 2006 data.

How can we do this?

- The **only way we can possibly approach these goals** is through a much more intense focus on professional education, continuing education, online learning and technology enhanced learning – from MOOCs to flipped classrooms..

- Otherwise we do not have the traditional capacity to meet the increased needs for both quality AND quantity.
  - Need to deliver educational experiences to K-12 that are not presently uniformly available.
  - Improve success, retention, persistence, and graduation rates through higher quality learning experiences.
  - Reach students unable to participate in traditional learning settings for a variety of reasons.

- Are we ready?

American Public and Land-grant Universities

- APLU-Sloan Survey -2009
  - Strategic Importance of Online Learning
    - interviews conducted with administrators, faculty, and students at 45 public institutions across the country and more than 10,700 responses from faculty across the spectrum of teaching positions – tenure/non-tenure track; full- and part-time; and both those who have and those who have not taught online
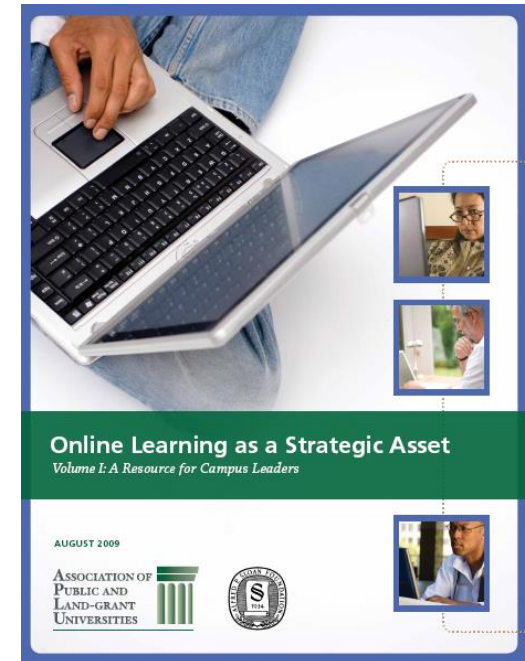- Critical to long-term strategy of institution   - 68%
- Represented in institution's strategic plan   - 41%
- Not critical to long term strategy   - 4%
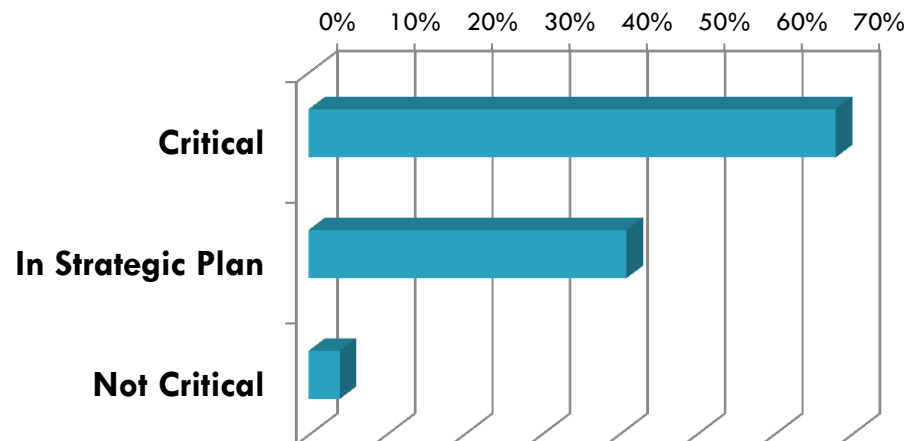
Online Learning as a Strategic Asset

- Survey revealed that President's know that continuing education and distance learning needs to part of the strategic plan,

- However, many of them **were not well equipped by past experience** to understand how these programs, once considered peripheral, could become an **integral tool of their institutions strategic plans**.

Online Learning as a Strategic Asset
Volume I: A Resource for Campus Leaders

AUGUST 2009

ASSOCIATION OF PUBLIC AND LAND-GRANT UNIVERSITIES

The Catalyst for the Future

- What do Boston, Bombay, Beijing, Bangalore have in common with

- San Francisco, Austin, Raleigh, Cambridge, and other world economic leaders?

- They are vibrant economic regions nucleated by world class universities.

- The President is right: we must do better!

The Secret Sauce?

- Universities pouring out highly educated graduates with skills and intellectual property.

- World class research that is curing illnesses and creating new jobs, companies, and even entirely new industries.

- And doing this at very large scale.

The Path

- The path to economic and social development in the world goes through our world class universities.

But all is not well!

- Many think that Higher Education **costs** too much

- Higher Education has not yet taken full advantage of the research into how students learn –**cognitive** sciences.

- Higher Education reflects **disparities** in access and quality

- While **technology** has certainly pervaded higher education, it has not as significantly changed it.

Higher Education costs too much?

- This widely held political position is most notable for the lack of understanding of why this might be –if indeed it really is!

- Nonetheless- we should buckle our seatbelts for a ride to drive down the cost of higher education -and many of the "well meaning" efforts will be far more damaging than helpful. Some will be downright foolish
  - like government attempts in Florida and Texas to mandate $10,000 bachelor's degrees –based upon political rather than academic considerations.
  - "New University of California," an institution with no faculty and no tuition

The 3 C's - the forces on education -*

- **Computers**
- **Communication**
- **Cognition**
- Many of the innovations that catch the eye of the public do a good job on the first two and a lousy job on the third.
- We know much more about how students learn, and learning environments need to change to create the engagement that leads to student learning.
- That is indeed happening at many places
  The NCAT, NRC Report, White House Conferences

* **"Using the Computer in Teaching Physics," J.M. Wilson, Physics Today 42(1) (January 1989).).**

Cognition

- My involvement with the recent National Research Council report reminded (and saddened) me to note that educational innovation often reinvents the wheel rather than advancing our understanding
  - –based upon the research on the way students learn.
- There are notable exceptions like:
  - The National Center for Academic Transformation
  - The Rensselaer Studio Courses
  - Carnegie Mellon Open Learning Initiative (OLI).
  - Many others but not enough.

TheNCAT –A brief mention

- Whenever anyone suggests that you cannot simultaneously enhance **quality**, **access**, and **cost** in traditional universities, I always ask them to look at the website of the National Center for Academic Transformation –founded right here at RPI.

- Conventional wisdom is that universities do not change, but many do –and many are documented here.

- It is particularly notable because many of these reforms were driven by research in the cognitive sciences and make student engagement paramount.

Rensselaer Studio Courses

- In the 1990's RPI led a nationally prominent effort to use the three C's of Computing, Communications, and Cognition to create new approaches to large enrollment courses
- The 200% Solution (A massive investment in student computing)
- The Rensselaer Studio
  - Calculus, Physics, Chemistry, Electrical Engineering, etc.
  - Won the Theodore Hesburgh Award, the Pew Charitable Trust Prize, the Boeing Prize, and many more.
  - Inspired the founding of the National Center for Academic Transformation with $8.8 million from the Pew Charitable Trusts.
- The Rensselaer Mobile Computing Initiative

Pioneer in Online and Corporate Education

- RSVP
  - General Motors
  - United Technologies
  - General Electric
  - Many Others

- ILINC – LearnLinc
  - One faculty member (me) two former students

The Team: ILinc LearnLinc Founders

Degerhan Usluel
Chief Technology
Officer

Mark Bernstein
Vice President
Marketing

Jack Wilson
Chairman and CEO

WSJ

"Interactive Learning International Corp. (ILINC), a two-year-old company in Troy, New York, has shown what's possible in today's world ..." – Fortune 1996

"Here is what an instructor using ILINC sees." accompanies a screen shot. -Wall Street Journal Aug. 6, 1998

TECHNOLOGY JOURNAL / NET INTEREST

Software Seeks to Breathe Life Into Corporate Training Classes

Workers Avoid Long Courses— And Long Trips

BY REBECCA QUICK
Staff Reporter of THE WALL STREET JOURNAL

THE INTERNET promises a lot of miracles, but here's one thing even it can't do: make corporate training classes actually enjoyable.

But maybe it can make them a little less painful.

A handful of Web companies are designing software packages that allow workers, sitting at their own desks, to learn everything from basic computer skills to accounting methods from live instructors. With just a computer and an Internet connection, these software applications allow you to dial in to a virtual classroom—along with colleagues from around the globe. The instructor can call on students, lead them through a presentation or throw out a pop quiz to make sure the class is paying attention.

For businesses, the biggest advantage is that cyberspace training cuts out the expense of getting the instructor and students in the same place. It also means that training classes can be pared into shorter sessions and spread out over a number of days or weeks—meaning you don't lose an employee for entire days at a time. Even better, instructors can train employees in multiple locations at one time, allowing for rapid deployments of, say, new software being rolled out to a corporate empire.

The no-travel-required aspect may also be the biggest benefit for the folks who actually have to endure corporate training classes. That means more time at home and less on the road—no more trips to headquarters to learn how to make a spreadsheet. Shorter training sessions are also a plus for
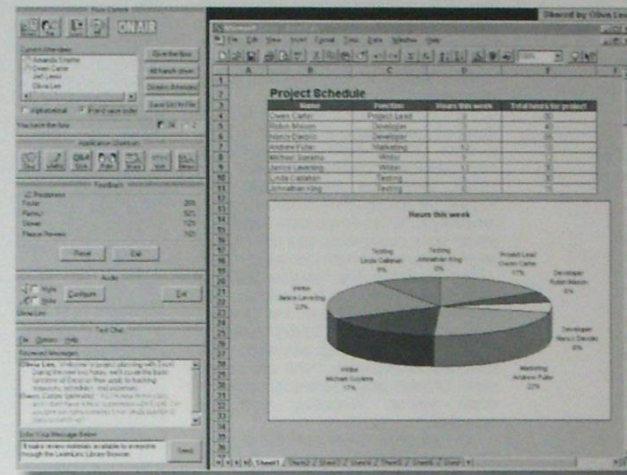
students: Studies show that retention levels drop (and doodling, no doubt, rises) significantly after two hours.

Of course, some things can't readily be learned over the Internet. Teaching presentation skills, for example, is largely about eye contact, voice projection and body language, skills that don't translate well in the digital realm. And some critics argue that on-line training will never replace the good old-fashioned way of learning.

Still, demand is clearly growing. One interactive-software supplier, Centra Software Inc. of Lexington, Mass., says its revenue has doubled each quarter for the past year. And earlier this year, International Business Machines Corp. acquired Data-

Beam Corp., a Lexington, Ky., firm that sells distance-learning software.

Here's how the software packages work: Students go to a special Web site, on either the Internet or a corporate intranet, and sign in. Once on-line, their screens split in two: On the left side are a set of controls for communicating with the instructor and other students, while the right side shows an application such as a browser, whiteboard or word processor.

Anything the instructor does on the right side of the screen automatically appears on the right side of the students' screens. So, if the instructor, say, moves to a Web site, the entire class is automatically dragged along. Speakers and microphones on the computers

(over please)

Here is what an instructor using Ilinc software sees. The left side displays a list of students logged on, command buttons for turning the floor over to a student, and a dialog box for typing messages to an individual student. The right side is where the teacher guides the students through presentations via an application like a browser.

The Rest of the Story….

- With help of Investment Banker and VC advisors:
  - A triple reverse merger.
  - Sold control of LearnLinc to GILAT Communication of Israel and at the same time used LearnLinc to acquire Allen Communications, John Bryce Training, and GILAT itself.
- Closed deal on February 29, 2000 for $52 million.
- Combination called Mentergy
  - Value was $500 million in March 2000.
  - New York, Salt Lake City, Europe, and Israel.
  - Created headquarters in Atlanta
  - As tech bust came, they entered bankruptcy in 2002.

The Reality of Online Education transcends

- If one reads the traditional press coverage of online education it is dominated by either
  - Skepticism
    - Can students learn?
    - Cheating
    - etc
  - Hype
    - MOOCs will change the world and make higher education obsolete
    - The hyper prestigious universities drive the change
- **Not!**
- So what is the reality and the future?

Nov. 2003 Press:
Has Online Learning failed?

- In November of 2003, the press was ready to pronounce online learning dead!

- Hardly!

- The rapid demise of Fathom, Cardean, Pensare, Virtual Temple, Harcourt University, Caliber and others

- The Red Sox, the Cubs, and 29 other teams didn't win the world series again this year either.

  - (ed. remember this was **2003**!)

- Just like baseball, distance learning has it's winners and losers!

Vintage Slide: AAC&U November 2003

Relentless growth nationally

Sloan Alt C- US Growth in Online
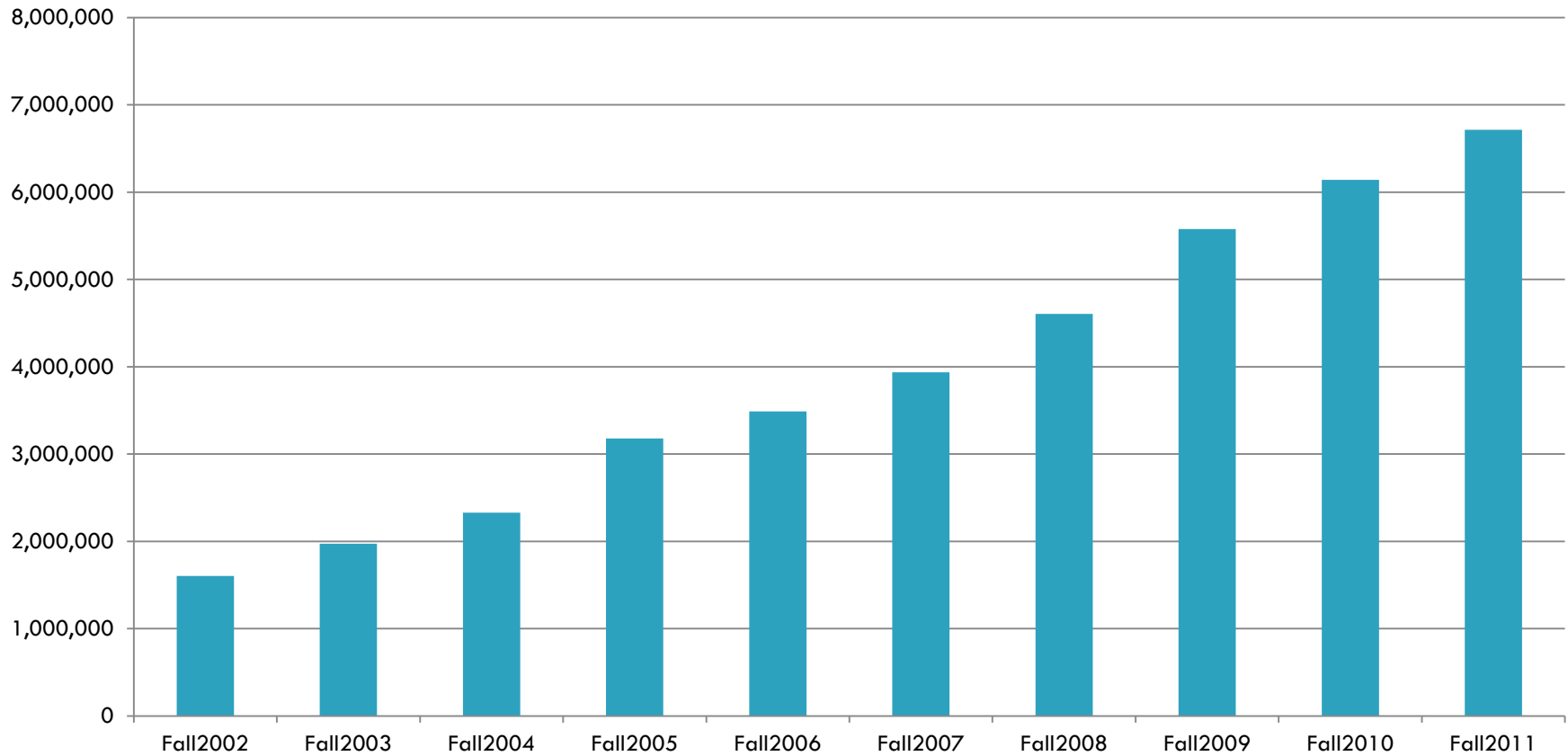
UMassOnline Growth 2001-2012

Revenue ($ Millions)
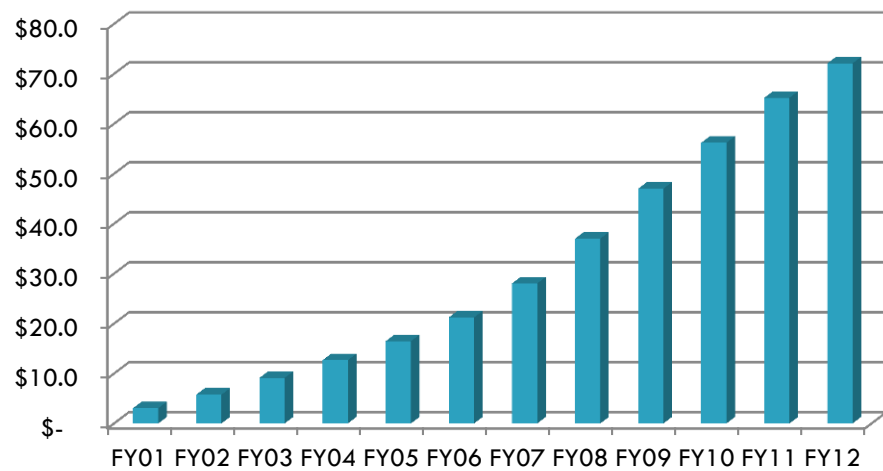
Enrollment
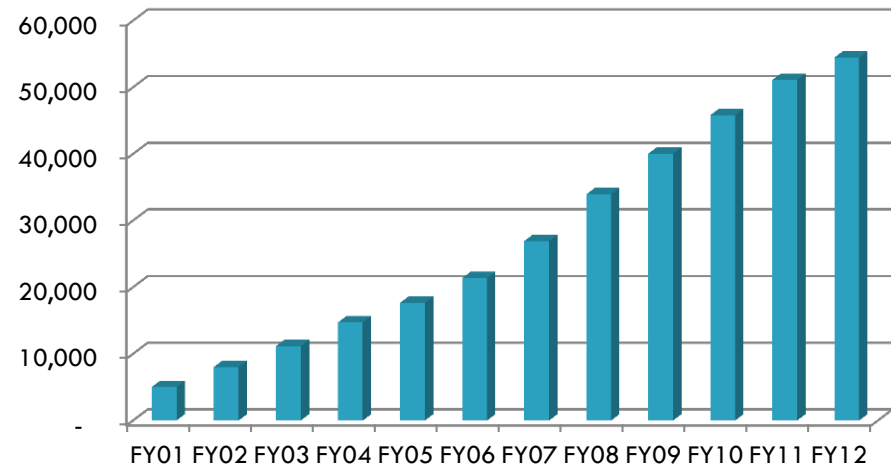
A Relentless Force that Will **Not** Be Denied
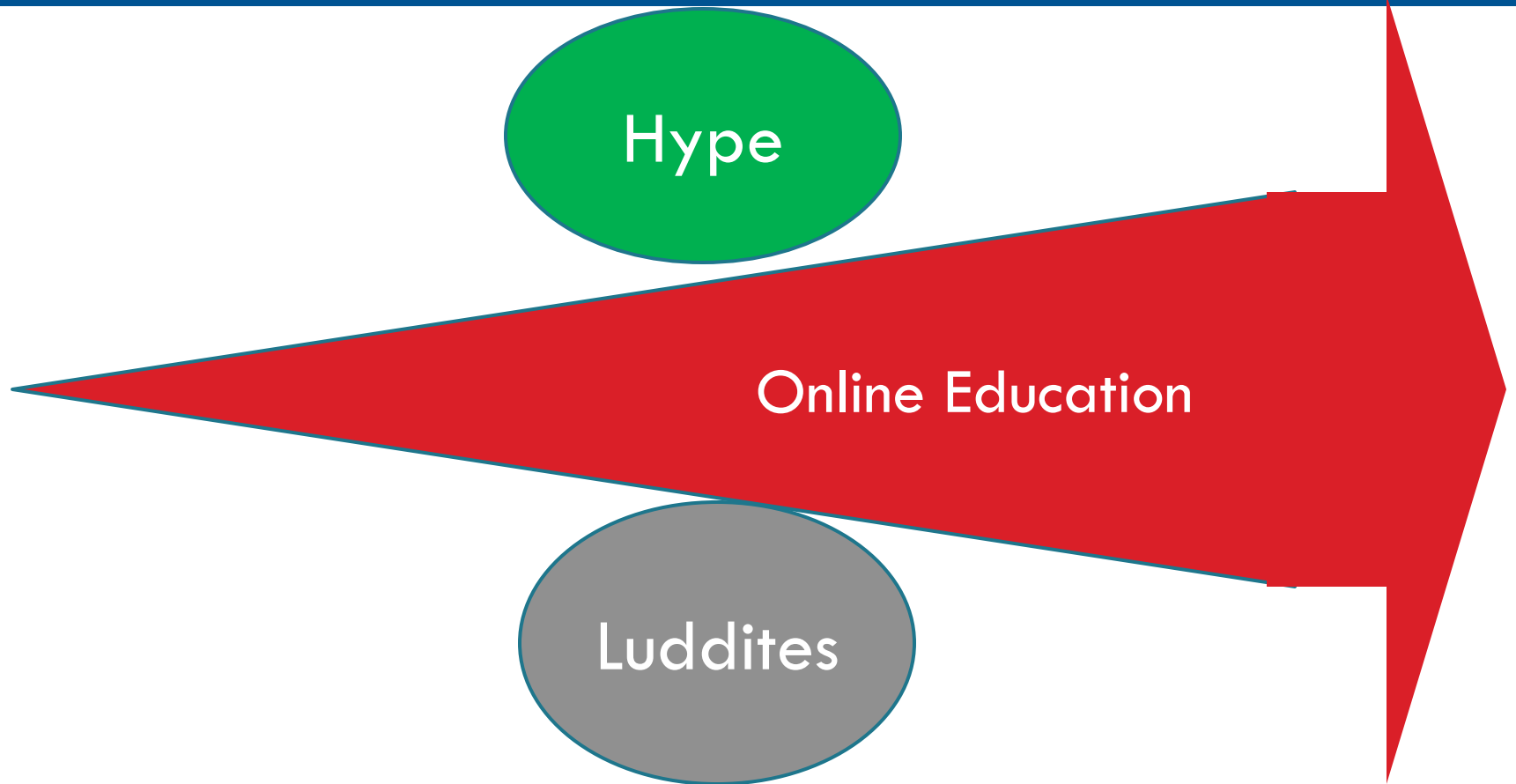
But far too many are in denial

- While change has actually been rather large scale, the conventional wisdom is that there has been little change.

- It is also probably accurate to say that even the large scale changes have not penetrated the culture of higher education nearly as much as necessary.

- There is no shortage of contrarian voices that decry even those changes that HAVE occurred.

- The disparity is creating a vacuum into which politics is inevitably drawn.

Are MOOCs going to change the world

- Too late. The world already changed without MOOCs even if Stanford, Harvard, MIT and others had not noticed!
- "the vast majority of people who sign up for MOOC's don't complete their courses, yet MOOC creators are hailed as visionaries rather than being denounced for their 10-percent completion rates" –Kevin Carey –Chronicle Blog

- MOOCs are interesting and valuable experiments, but they are not on the critical path of online education –at least in their current form. BUT……
- Online education is changing the world, and MOOCs can be a part of that.

Massive Open Online Courses MOOCs

- Kahn Academy -2006
  - Salman Kahn –non-profit -2006
- Udacity -2012
  - Sebastian Thrun, Stanford - for-profit
- Coursera -2012
  - For-Profit – Andrew Ng, Daphne Koller, Stanford
- edX (MITx -2011 and edX in 2012)
  - Harvard, MIT, Berkeley –non-profit
- Udemy -2010
  - Eren Bali and Gagan Biyani –for profit

What MOOCs Bring to the Party

- Most importantly they bring a recognition by the brand name universities that online education has changed the world and they almost missed the bus!
- They encourage faculty who have not been involved to become involved.
  - Faculty who get involved in online education become more self reflective on teaching and learning.
- They create good content presentations with (in the best of them) built-in assessment tools for student self assessment of progress.
- They generate interest in the press that the larger and more successful online programs never have!
- They attract venture capital to the education space.
- They create a data rich learning environment that can provide extensive data to help us understand how students learn through cognitive research.

What MOOCs need to work on

- Content and self assessment do not constitute a learning environment (More on that on a future slide)

- The large numbers of users is vastly inflated by window shoppers.
  - exponential drop-off power law that characterizes participation in today's MOOCs (i.e., the final course lectures have 5% the viewing rate of the earliest lectures).
    - Mehran Sahami, Stanford University at SIGCSE

- The percentage of students who successfully finish is tiny.

- Credit is not (usually) given by the institutions creating MOOCs.

- MOOCs thus far are **courses not curricula**

- MOOCs do not (generally) provide the kind of engagement that has been shown to encourage learning. (See George Kuh….)

- Some assume that although their "good" institutions will never use MOOCs, that this will be a charitable donation to the "lesser."
  - Data on that is coming in the next slide

What do the Professors Creating MOOCs Think?

- Some results are what most of us would expect.
  - It takes an extraordinary amount of work to create a MOOC and even more to create a good one!
  - Faculty had to do this on their own time and did not get credit of doing this through their teaching load assignments.
- Some of the results are more revealing:
  - **75%** of the respondents did not think that MOOCs would significantly reduce costs at their institution (35% none and 40% marginal).
    - That certainly goes against the conventional wisdom! "*everyone at the US Dept. of Ed thinks that MOOCs finally will help to make significant cost reductions in higher ed*!" –Dept. Of Ed. Official.
  - **72%** of those teaching MOOCs did **NOT** think that students who successfully completed their MOOC should get academic credit at their own institution, and **66%** believe that they **NEVER** would grant that credit.
    - The article makes that a positive in that 28% actually DO think they deserve credit. Some truth to that.
- The most revealing result: When those same two issues were explored for **SOME OTHER** institution, the respondents thought that they might have **far more impact**.
- At this point, those involved with MOOCs are quite **excited** about the possibilities, **daunted** by the work required, and convinced that they will not significantly change their institution, but that they might change **others**.
  - **http://chronicle.com/article/The-Professors-Behind-the-MOOC/137905/?cid=at&utm_source=at&utm_medium=en#id=overview**

The Biggest Myth of MOOCs

- Education will be free –or at much lower cost.

- "How can colleges charge $50,000 a year if my kid can learn it all free from massive open online courses?"

  --Thomas Friedman –NY Times March 5, 2013

- "The question is not just whether MOOCs are going to disrupt traditional education, but how. Is it just about lower costs and access?" -Clayton Christensen, Harvard

- The threat is to the random little-known accredited college and the person you've never heard of who is employed there teaching garden-variety, highly-replicable three-credit courses. As Thrun credits become widely accepted, people will be less willing to pay for the other kind. -Kevin Carey, Chronicle of Higher Ed. Dec. 14, 2011.

MOOCs are not cost free.

- They look cost free because they have been done on the margin by outstanding faculty who wish to devote the time to create them, but who may not wish to continue to devote the time to operate then and revise them with the change of both content and technology.

- The unit cost can indeed be made lower by large scale use, but that does not take into account the costs of other portions of a learning environment that do not demonstrate the economies of scale.

- People do not pay for content, they pay for something much larger.

The dangers of hype

- Students get hurt by well meant, but poorly designed experiments.
- Money gets wasted at a time when every dollar is precious in higher education
- Good ideas get discredited by over-reaching and then failing.

- To anyone in the audience that I offend, I offer this prior apology but…..
- I hope that it encourages you to adopt a position of scientific skepticism and innovative optimism.

An example from the past: Content and the Value Chain

□ "Given what MIT has done (OCW), how can UMassOnline compete?" – **Boston Globe** reporter in 2002

What MIT provides

- **Course materials**

No access
- **Reputation**
- **Courses**
- **Faculty**
- **Credentials**
- **Curriculum**
- **Students**
- **Alums**
- **Library**
- **Facilities**

Vintage Slide: AAC&U November 2003

Content?

- ☐ The smallest part of the value chain.

- ☐ A Techno-MBA Course that I taught at RPI
    - ◻ 75-125 students (business execs)
    - ◻ **$ 3000** per student (indicator of value?)
    - ◻ A book might be **$50** (content)
    - ◻ MOOC or Web site is open and free
    - ◻ Revenue: **$225,000 - $375,000**
    - ◻ One faculty, one full time TA

- ☐ Content is king?
- ☐ What do students REALLY pay for?

Vintage Slide: AAC&U November 2003

The Value Chain

What do students want and pay for?

Content

Delivery

Peers

Instructor

Brand
Reputation (not prestige)
Credit fits in here.
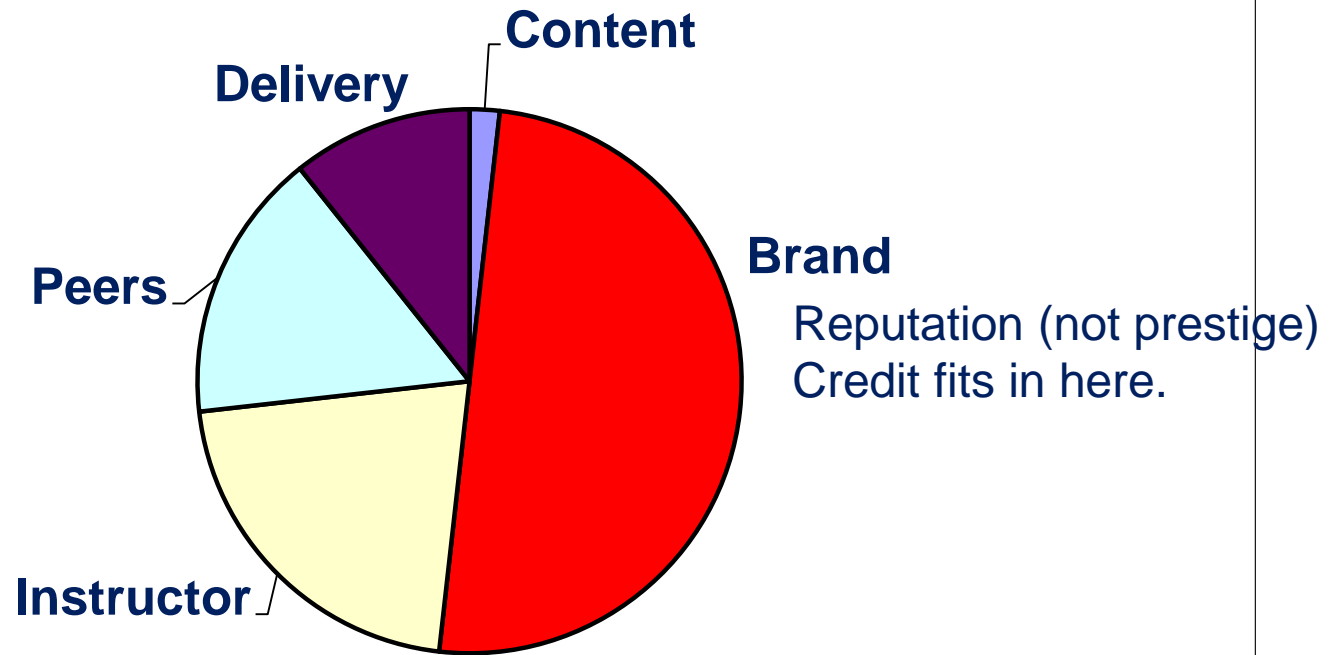
A Brief History of "Distance Learning"

- Correspondence Courses
- TV Courses – Cable, Satellite, Videotape
- Interactive Video Courses (2-way satellite, videoconferencing, and now Skype)
- ALN – "traditional" online education
- MIT OpenCourseWare
- Carnegie Mellon Open Learning Initiative
- MOOCs

- Unfortunately many of the MOOCs look eerily like the "moving hand writes and then moves on" of the video days!

The transmission (lecture) model

- The mainframe approach
  - Face to Face: The Lecture
  - Distance: TV (Cable, Video, Satellite, or MOOC)
    - Pushes the back wall out a few thousand miles
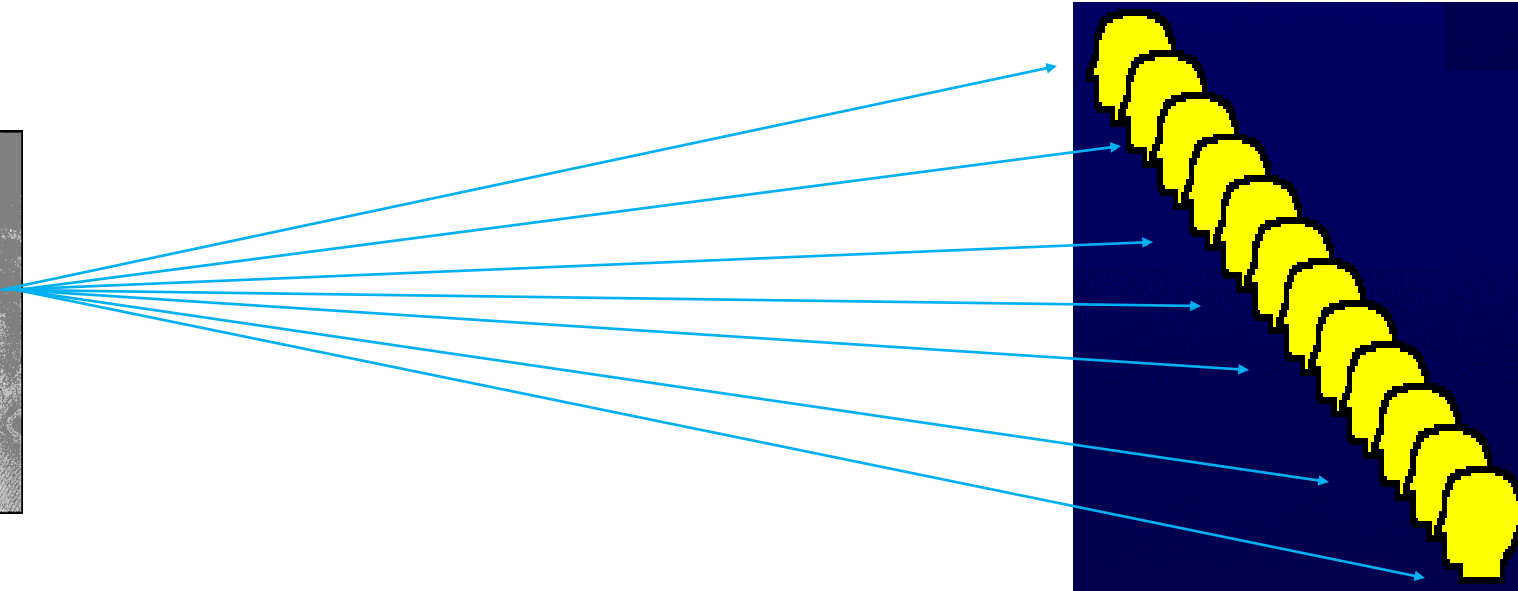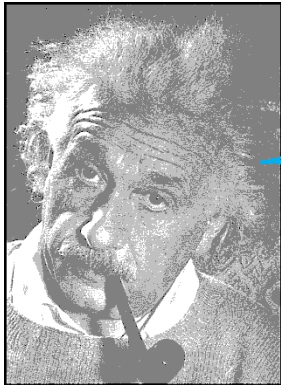
Which can become the usual on-line course organization

"The 24-Hour Professor;" Chronicle of Higher Ed; May 31, 2002
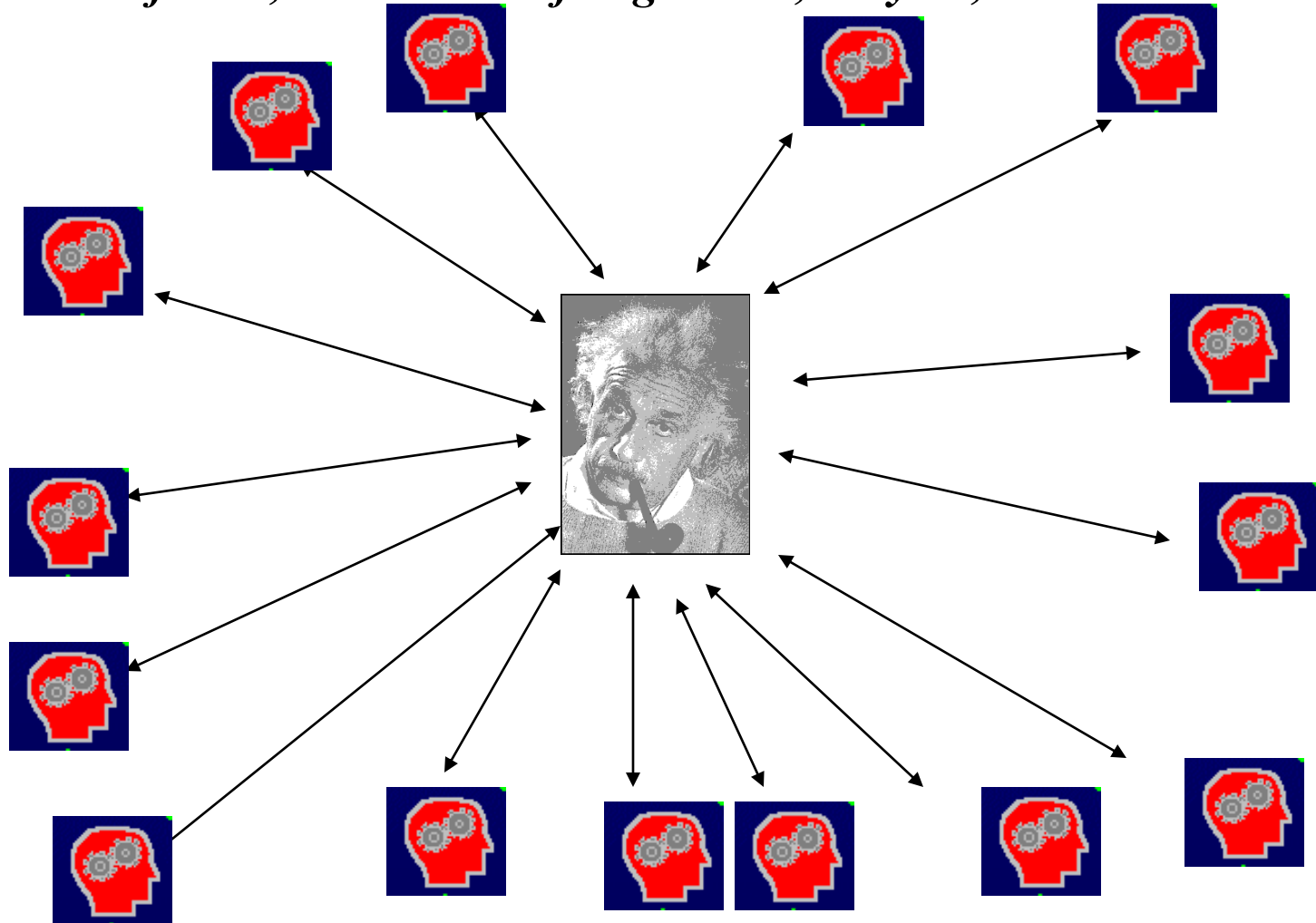
Engagement

- Faculty with student (half done in lecture)

- Student with material (reading, homework, papers, adaptive tutorials, most MOOCs, etc)

- Student with Student (peer learning, small groups, team based projects, studio classrooms, etc)
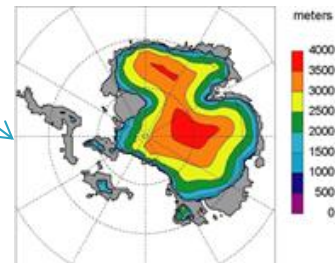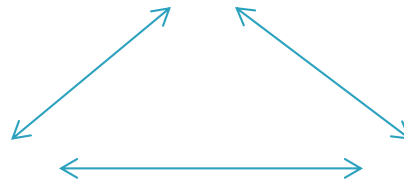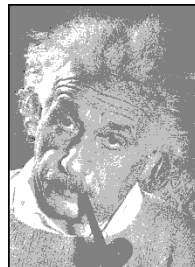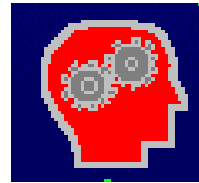
Climate change models, R. Decanto
UMass/Amherst

Distributed Collaborative On-line Model
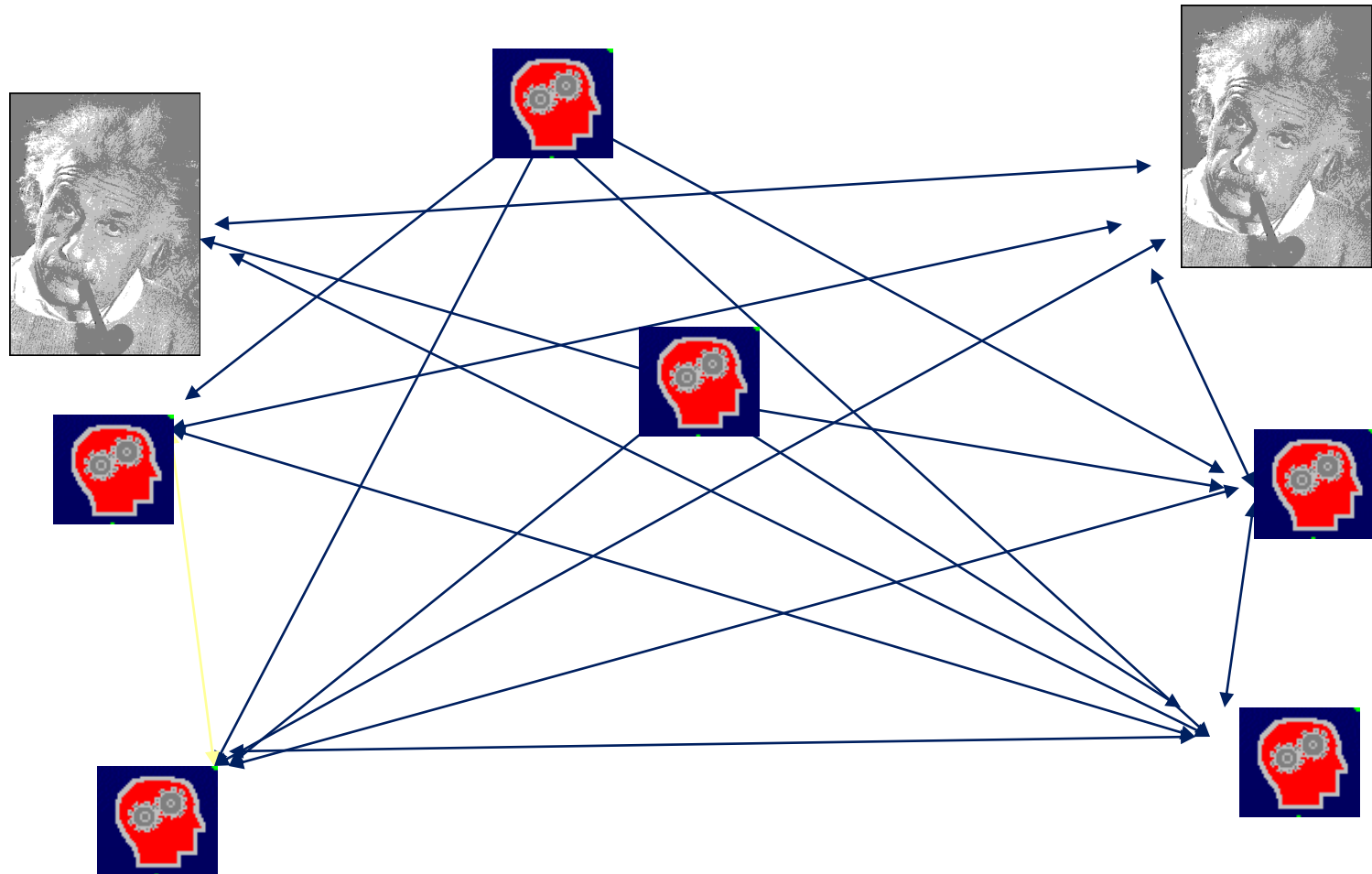
Collaborative Learning, Peer Learning.....
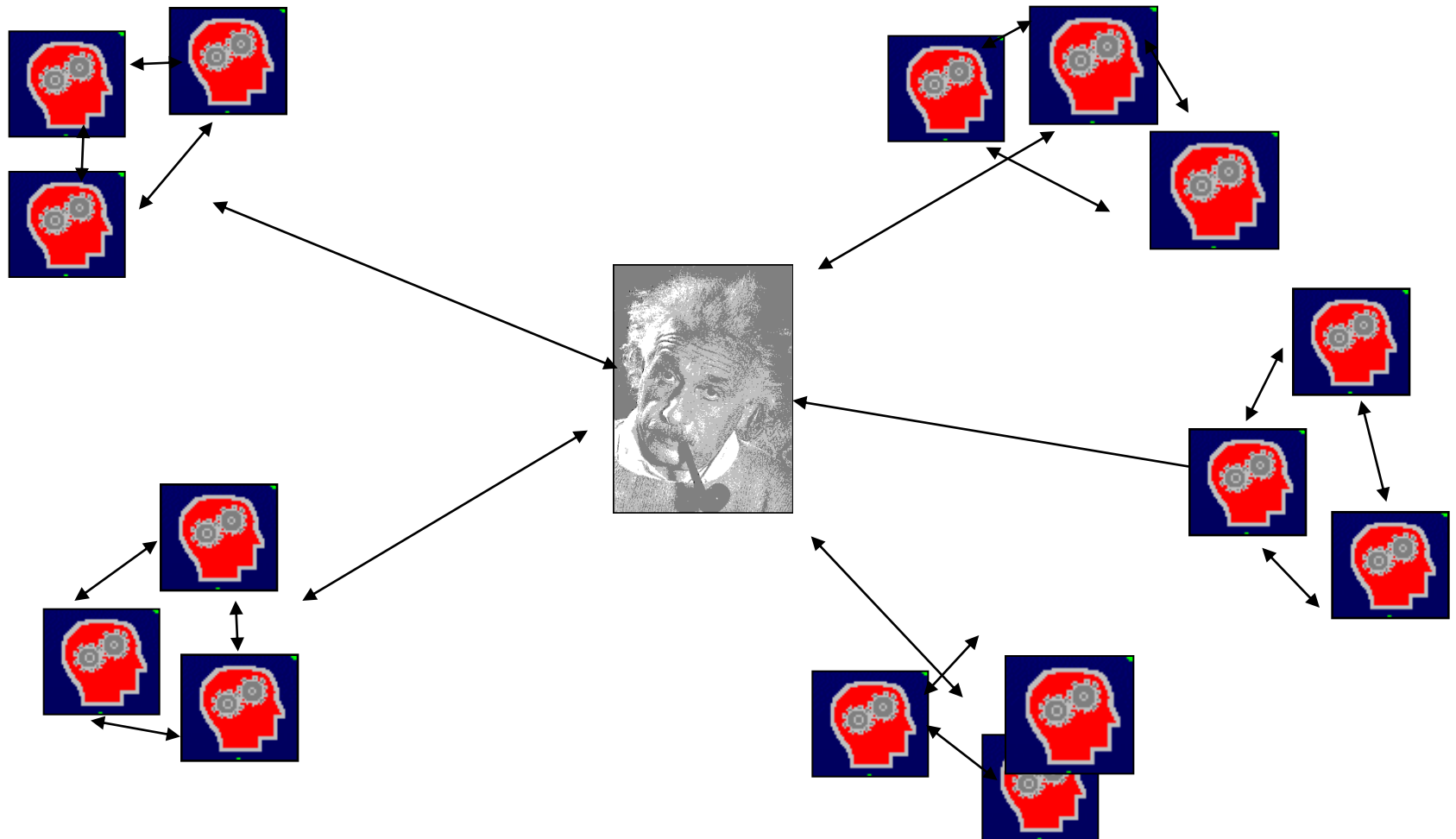
MOOCs Forum

An international publication dedicated to discussing and resolving the pedagogical, legal, academic, record keeping, and security issues related to Massive Open Online Courses and emerging opportunities for collaborations between academia, industry, and government agencies.

Multidisciplinary in scope, *MOOCs Forum* is the public venue for examining key issues paramount to the success of MOOCs such as:

- Development, challenges, and success of massive open online courses
- Student registration and identification
- Successful business models
- Course content and quality
- Course testing and grading
- Increasing completion rates
- Course credit and matriculation
- Security
- Material copyrights
- Acceptance standards for professional continuing education
- And all evolving topics related to the field!

For more information visit **www.liebertpub.com/mooc**

Editorial Board

Summary

- Universities have changed rather radically in many ways.
    - Meteoric rise of online learning
    - Involvement in economic development
    - Deployment of 2 of the 3 C's
    - Disinvestment by government
- The future will continue to be quite a challenge for leaders of higher education.

Thank you.

- Jack M. Wilson
  - President Emeritus and Distinguished Professor of Higher Education, Emerging Technologies, and Innovation.
  - www.jackmwilson.com