eLearning: The Killer App
Continuous Education for Life

Creating Lifelong eLearning Environments From the Convergence of Computing, Communication, and Cognition

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What shapes my views?

- **Service as:**
  - 31 years as a professor
  - Physics Department Chair
  - Director, Anderson Center for Innovation
  - Dean of Professional and Distance Education
  - Dean of the Undergraduate College
  - Dean of Faculty
  - Interim Provost
- **Founder, CEO, Chairman of LearnLinc**
  - a successful eLearning Co (NASDAQ: GICOF)

What shapes my views?

- **Experience at Rensselaer implementing**
  - Studio Classrooms and Interactive Learning
  - Student mobile computing (laptop)
  - Interactive distance learning program
- **National Acad. of Science/National Research Council**
  - Committee on Information Tech.
  - Physics Decadal Overview Committee
  - National Digital Library Committee
- **Pew Center for Academic Transformation ($8.8 M)**
- **One of founders of the Nat. Learning Infrastructure Init.**
- **Chair, NY State Task Force on Distance Learning**
- **Industry Consultant (IBM, AT&T, Lucent, Ford, GM...)**
- **Army TRADOC Advisory Committee**
- **Wash. DC: 8 yrs on Science Education: HS. and Univ.**
- **Lots of visits, speeches, writing, reading, and visitors**

And Now?

- **Chief Executive Officer**
  - UMassOnline.net
  - Virtual University for the State of Masschusetts
  - Drawing on the intellectual capital of the University of Massachusetts system.
    - Amherst
    - Lowell
    - Boston
    - Worcester
    - Dartmouth
- **Why CEO?**

Learning: The Killer App

- **Is Learning the "Killer App" of the next generation of computing?**

<div align="center">

Yes!

</div>

The Fact:

- **It is the worlds best communication tool**
   combined with what will be the
- **World's Largest Library**
   Creating the First and Only
- **Global Continuous Learning Environment**

Relentlessly changing the way we
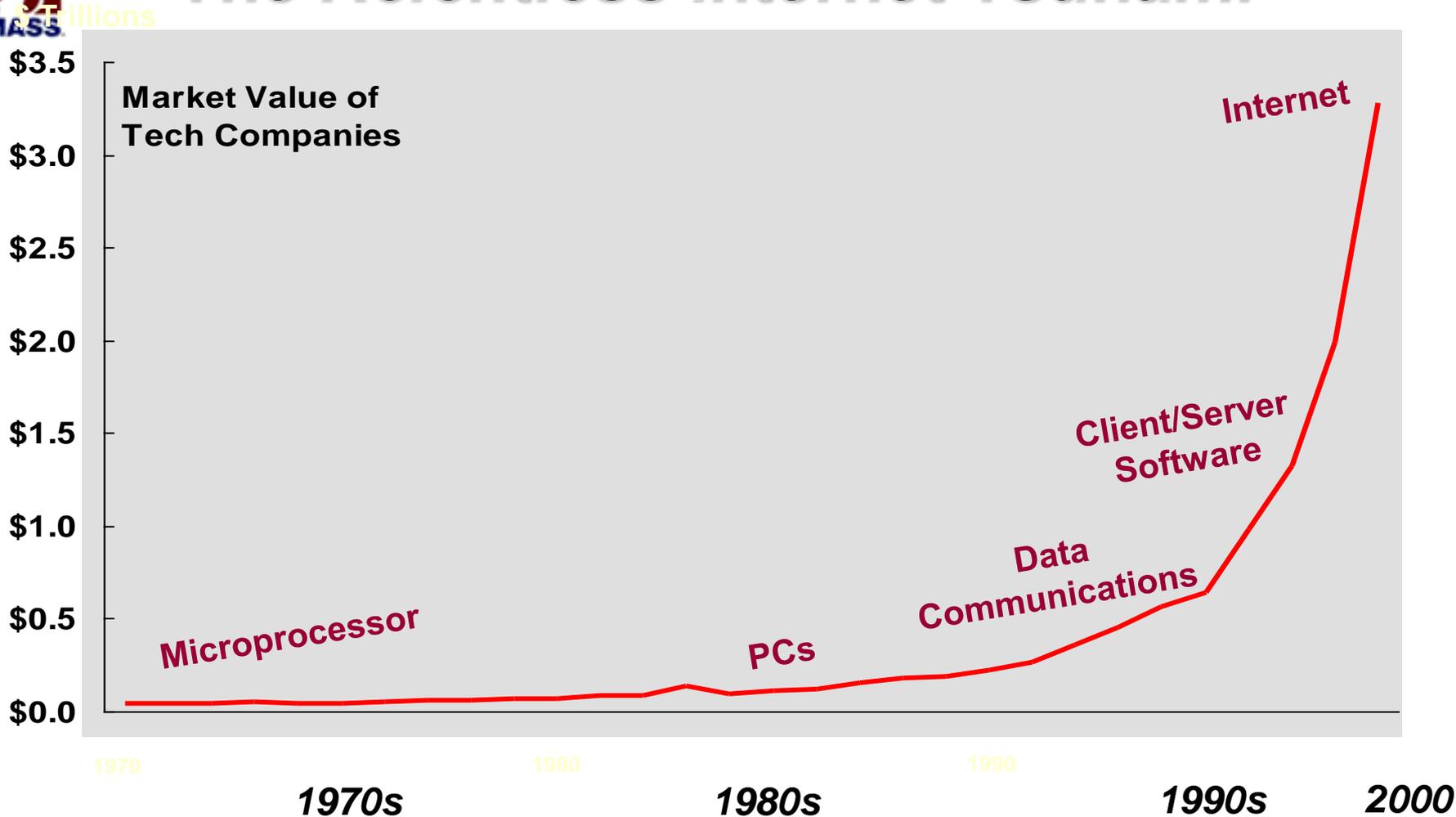
- **Labor**
- **Live**
- **Love**

   and
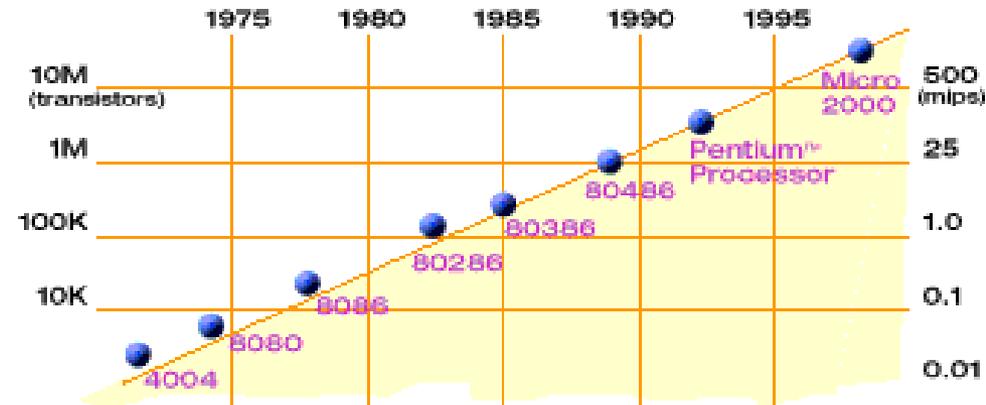
- **Learn**

The *Relentless* Internet Tsunami

$ Trillions

Market Value of Tech Companies

$3.5

$3.0

$2.5

$2.0

$1.5

$1.0

$0.5

$0.0

Internet

Client/Server Software

Data Communications

Microprocessor

PCs

1970   1980   1990

1970s   1980s   1990s   2000

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Incl. Int'l Tech Companies
Source: Securities Data Company

Wilson's Favorite Laws!

- **Moore's Law:**
  - CPU performance doubles every 18 months

- **Bandwidth law:**
  - Bandwidth is doubling even faster!

- **Metcalf's Law:**
  - the value of a network scales as n^2 where n is the number of persons connected.

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A New Paradigm

- **OLD Paradigm:
Physical Capital / Resources**

- **NEW Paradigm:
Knowledge / Intellectual Capital**

  – Frank P. Quattrone
    Managing Director
    Head of CSFB Technology Group
    Credit Suisse/First Boston

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Why we are running so hard?

- **The Internet's pace of adoption eclipses all other technologies that preceded it.**
  - Radio was in existence 38 years before 50 million people tuned in;
  - TV took 13 years to reach that benchmark.
  - The Internet crossed that line in 4 years, once it was opened to the general public.

- **Internet Time**
  - 1 internet year = 2 dog years = 14 people years

The horrible mismatch

- **People change very slowly**

- **Technology changes very rapidly**

What Happens to the Universities?

- **Proprietary universities cherry pick**

- **Brand name universities franchise**

- **Publics turn to government for protection**

- **Privates either "get it" or struggle**

Proprietary U's Cherry Pick

- **Venture Capital is flowing into space**
  - $1.7 billion has been invested in new ventures in an effort to tap an education market estimated at over $600 billion annually

- **Focus on Management and IT**
  - Cash cows of the universities
  - ~ 20 courses teach the majority of the SCH

- **Focus on Education for the Masses**

- **Avoid the expensive specialties**

- **Team with Universities, then supplant**
  - Cardean, Phoenix, Capella, Jones International, etc.

Brand Names Franchise

- **U. Penn Wharton School**
- **NYU- On-Line**
- **MIT-Singapore-Microsoft**
- **Stanford**
- **eCornell**
- **Columbia: Fathom**
- **Cardean University**
- **Formation of for-profit subsidiaries of many many other universities.**

Publics turn to gov't for protection

- **All *dog technologies* turn to the government for protection – George Gilder**

- **Outmoded rules**
  - NY State Regents – DL Task Force
  - No one follows the rules
  - Capacity review

- **Protectionism**

Lewis Perelman

- **"I've analyzed and forecasted trends that, I am increasingly confident, will lead eventually to the collapse of the academic system in a way and for reasons that are basically the same as those that led to the collapse of the Soviet system."**

- **Perelman does not think that there is any hope at all for reform in higher education and he thinks that reform is a complete waste of time.**

- **In his words: "I have no interest in reform; and, when asked, I discourage others from wasting time and money on it. Education reform over a period of decades has proven to be either unnecessary, futile, irrelevant, or even downright harmful. "**

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Denial

- **Others in higher education are in denial.**
  - They hide behind platitudes of "immutable values" and "centuries of stability."
- **One university administrator once responded to one of my talks by asserting that the current structure of higher education was the "stable product of long evolution."**
  - I pointed out that the dinosaur was one of the most stable products of long evolution, but that evolution does not create "stable products!"
- **It will be important to understand the core values and practices and to see how they play out in this changed environment.**

What about K-12?

- **THE Issue in this election.**
- **Widespread dissatisfaction**
  - Across spectrum from the wealthy to the poor
  - Quality
  - Access
- **Diverse "solutions"**
  - Increased funding
  - Vouchers
  - Private operators for public schools

Problem in Science & Math

- **Few high school students studying math & physics**
- **Lack of qualified teachers**
  - This is rapidly getting worse!
- **Rural and inner cities are particularly bad**
- **Result:**
  - Decreased access to top tier education
  - Decreased access to high paying technical careers
  - Disproportionate access by demographic groups

Organizing the University

Herding Cats?

What are the healthier opportunities?

- **Key Trends:**
  - Pervasive Technology
  - Globalization
  - Mass Customization
  - Focus and Differentiation

- **In Universities, remember that the 18-21 year old will still be with us, and many will want the whole thing.**
  - Focus on the Student's Experience (on-line or in-class)

- **"Bricks and Clicks"**

Pervasive Technology

- **Studio Classrooms**

- **Laptop Curriculum**

- **Fully wired campus**

- **Fully "wireless" campus**

- **Distributed Learning**

- **Used pervasively not just for homework, in computer labs, or outside of class.**

Globalization

- **Extending your reach globally**
  - – Not just marketing your programs overseas

- **Bringing global experiences to students**
  - – Junior year abroad is nice …. but…..
  - – An international student body is nice…… but…
  - – Exchange programs are nice ……but….
- **Allowing students to participate in experiences that they could not have in their schools.**

Mass Customization

students

- ***The notion is that you take ~~customers~~ and put them at the center of their own universe. –Jeff Bezos, CEO of Amazon.com***
  - Amazon.com
  - Dell Computer
  - Expedia.com

Mass Customization

- **Mass Customization is NOT**
  - Pandering
  - Allowing the student to define the course
  - Abdicating responsibility for student learning

Mass Customization

- **Mass Customization is**
  - Based upon sound cognitive research
  - finding out where the student is (initial condition)
  - Defining a personalized path to success

- **Mass customization is only practical through creative use of technology**

Focus and Differentiate

- **No more "all things to all people"**
- **Not every institution can sell distant learning to Asia!**
- **Watch for "consolidation" or "shakeout"**
  - Failures are good for the system and bad for the victim
- **What is YOUR special expertise?**
  - Babson, CalTech, etc.

You ain't seen nothin' yet

- **How can technology help?**
  - Remember Moore's Law, the Bandwidth Law, Metcalf's Law.
  - Present asynchronous courses are primitive and rudimentary precursors to real distributed learning.
  - Don't wait, get started now.

- **"Don't look back, somethin' might be gaining on you." –Satchell Paige**
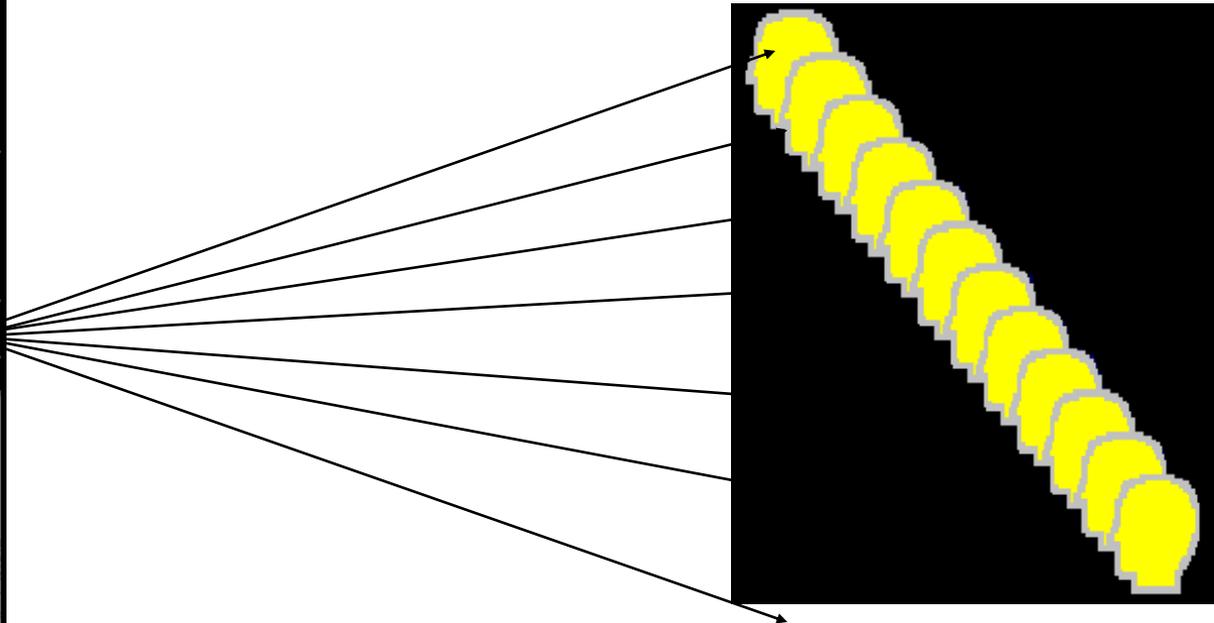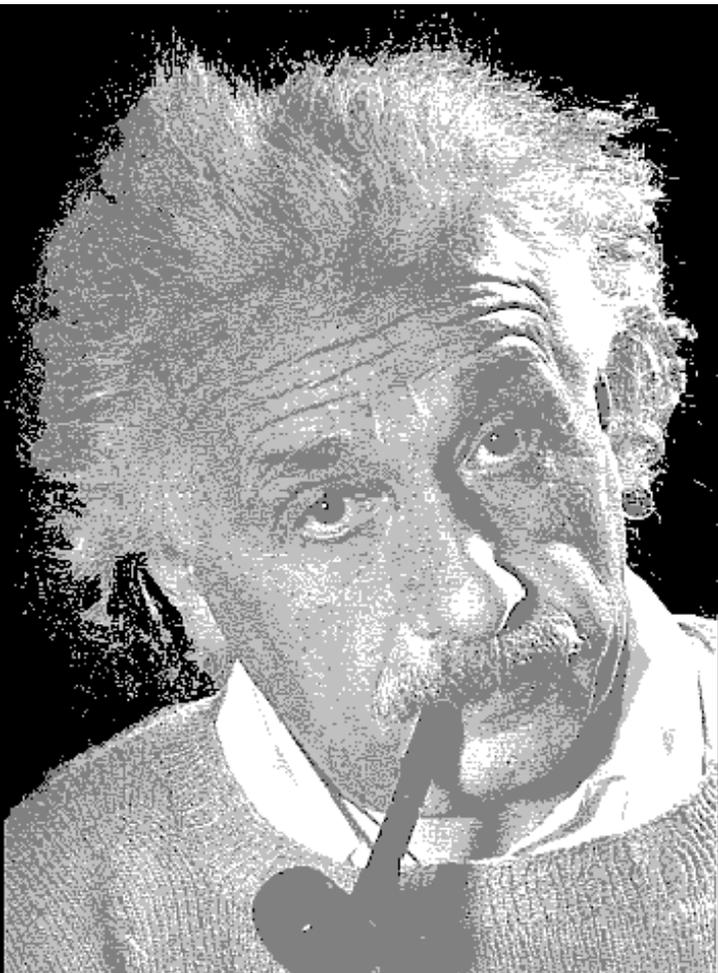 - Do it while the whole system is operating!

In flight repairs
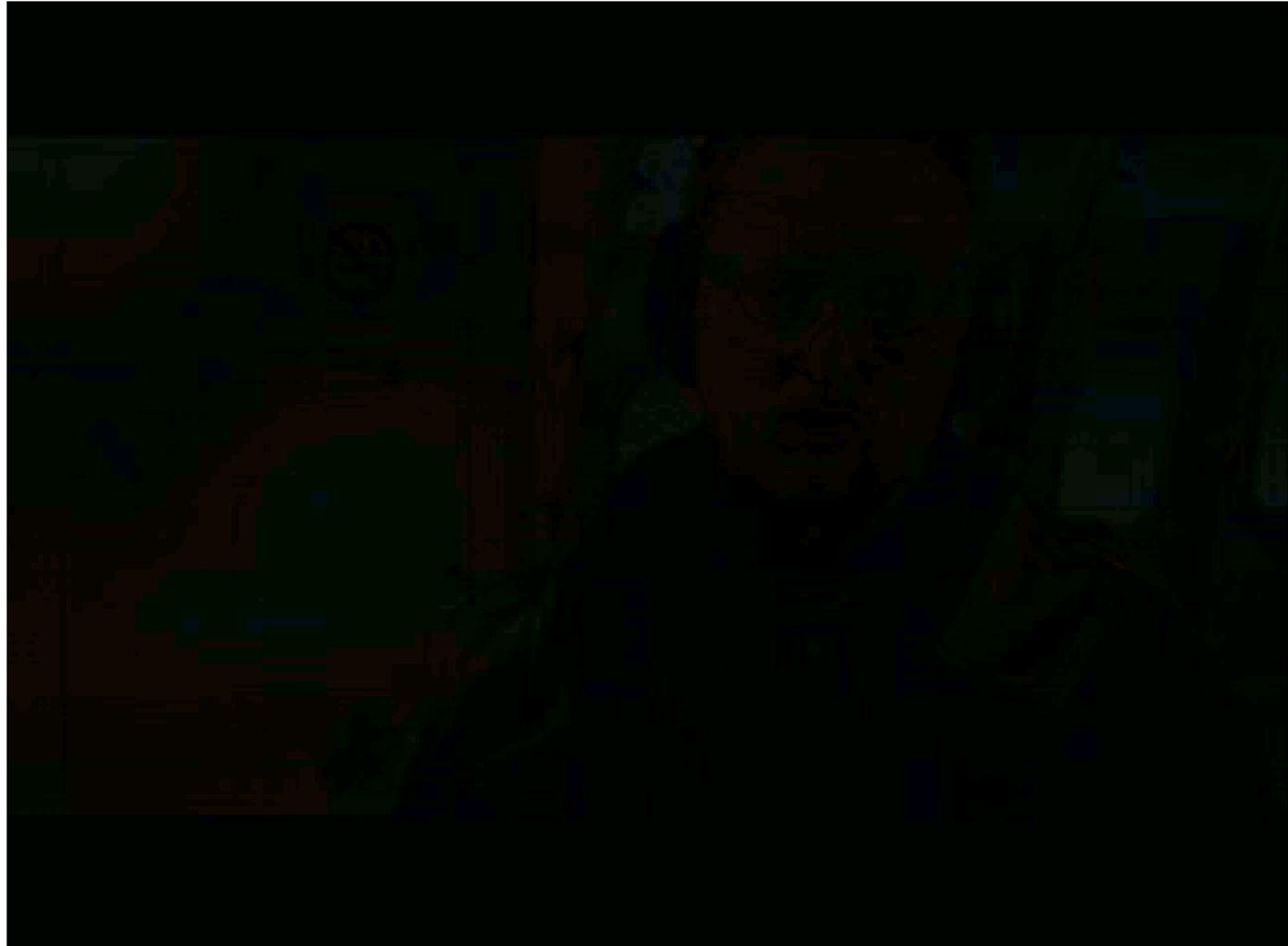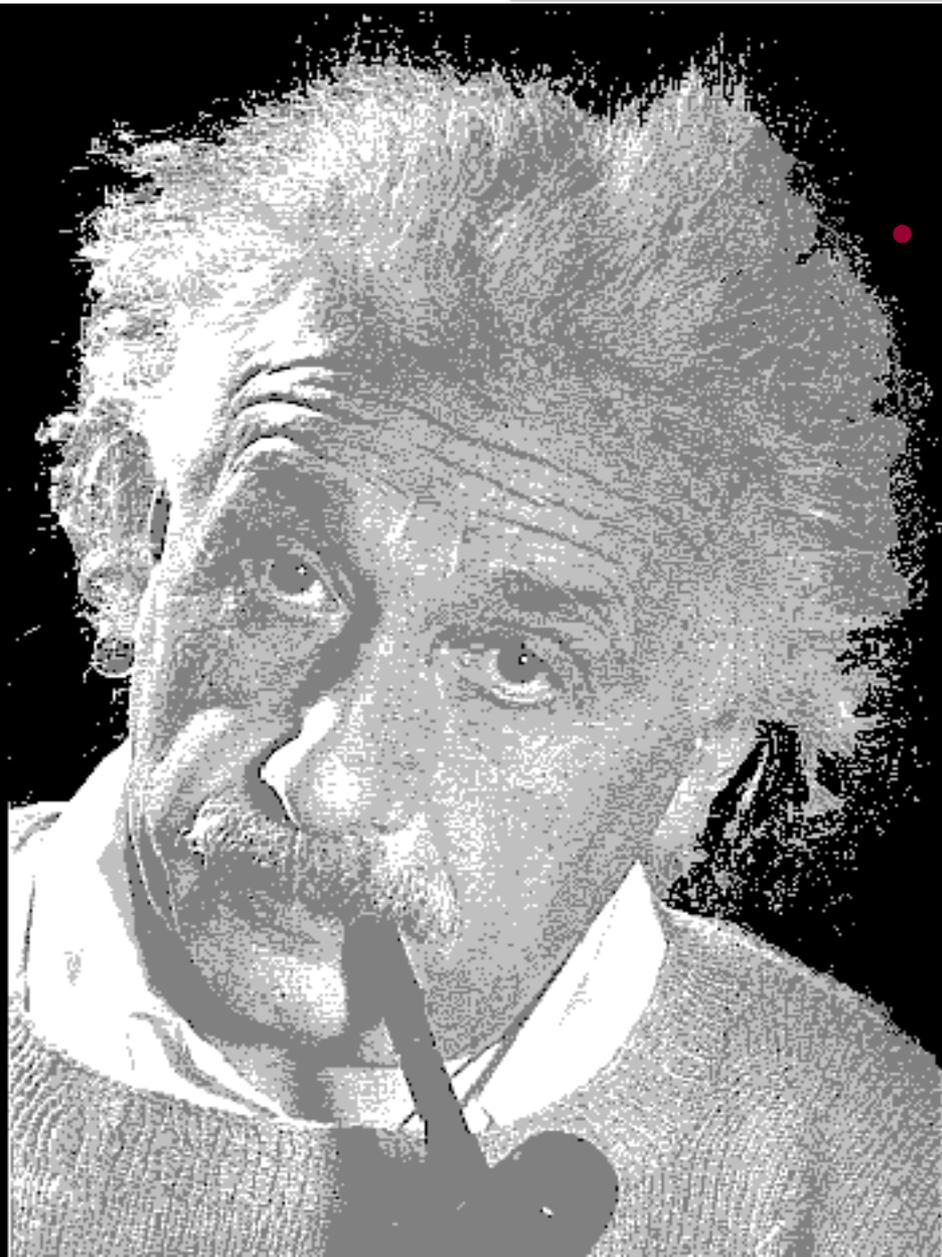
What happens to me?

- **Will the Web or a CD-ROM Replace your <Blank> Instructor?**

  – The faculty member's fear

  – The legislator's hope?

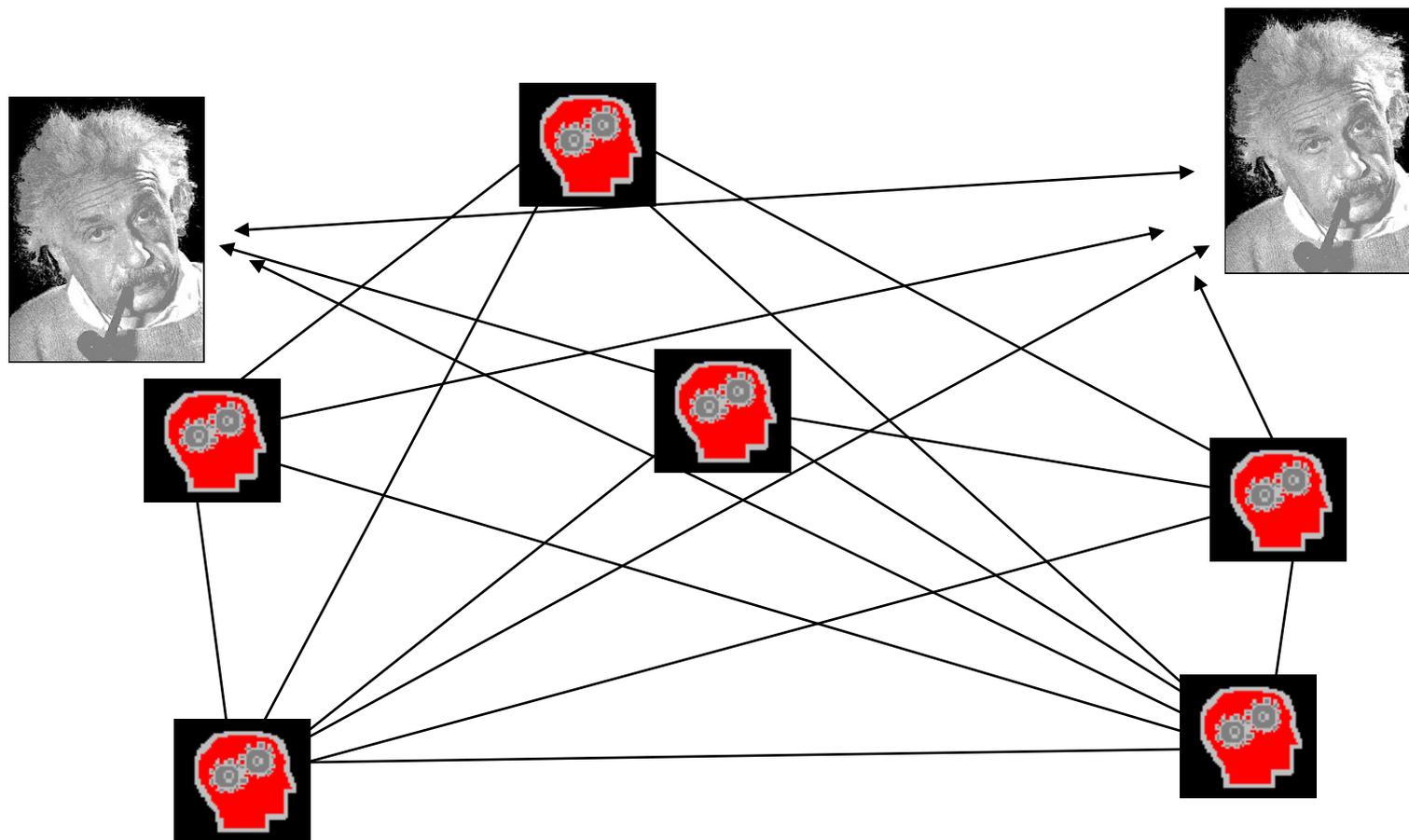MWilson.com

The transmission model

- **The mainframe approach**

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Interactive Learning

- **Distributed Collaborative Model**

The Studio Classroom

- **Hesburgh Award 1995**
- **Boeing Award 1995**
- **Pew Prize 1997**
- **Pew: $8.8 Million in 1999.**

New Resources

- **Texts**
- **Interactive Texts**
- **Access to Databases**
- **Full Motion Video**
- **Data Acquisition/Analysis/Visualization**
- **Collaboration**
- **Live Links to Experts**

The Forty Year Degree

- **Christopher Galvin, President Motorola:**

- **We are not hiring any more graduates with four year degrees.**
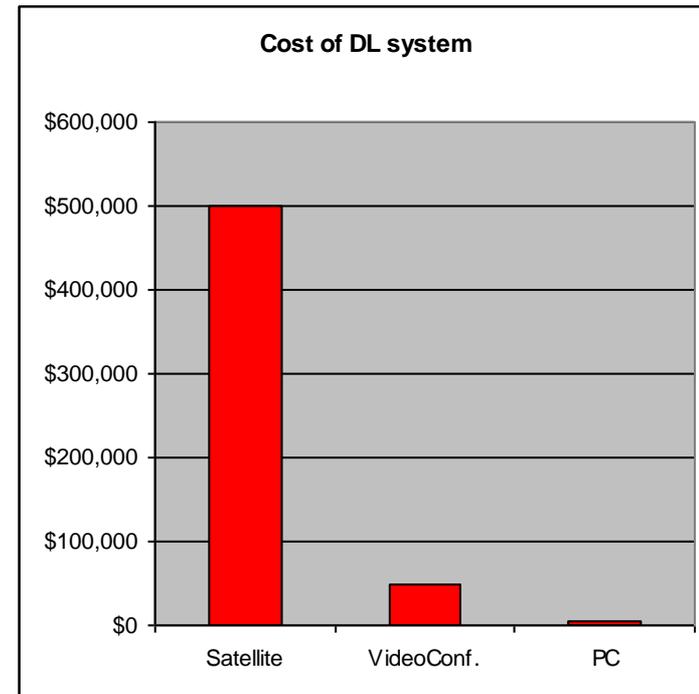
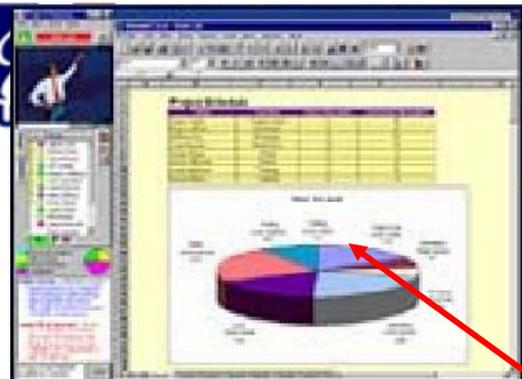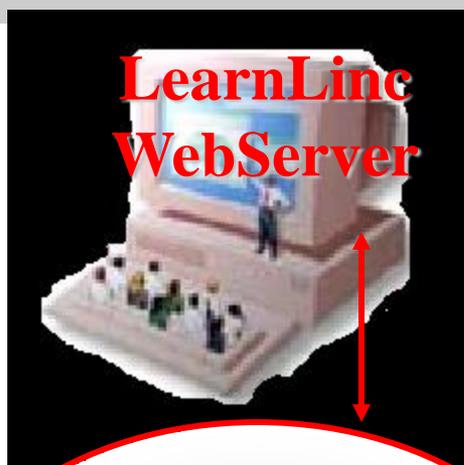- **We want employees with forty year degrees**

Distance Learning Technologies

- **Satellite Video ($500,000)**

- **ISDN Videoconferencing ($50,000)**

- **PC Collaborative ($5,000)**
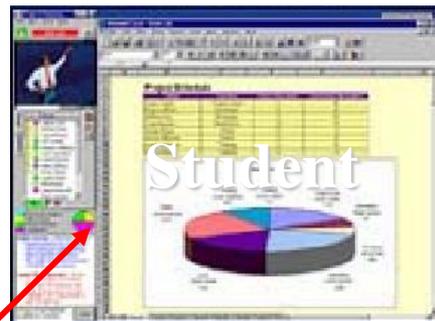
- **Web Based Asynchronous ($5,000)**

- **Example: ILINC** Learn**Linc**

    – Live Internet Audio (optional Desktop Video -multicast)

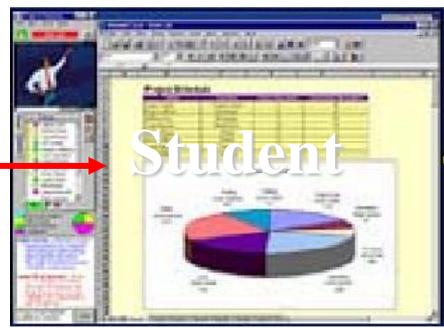   – Network based materials management

    – Classroom management

Cost of DL system

$600,000	
$500,000	
$400,000	
$300,000	
$200,000	
$100,000	
$0	

Satellite   VideoConf.   PC
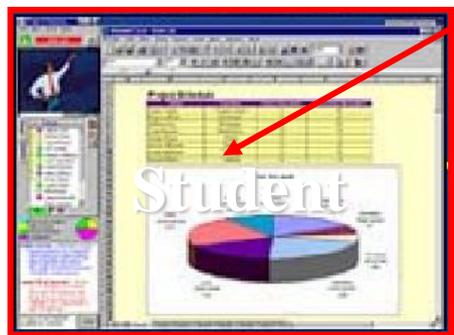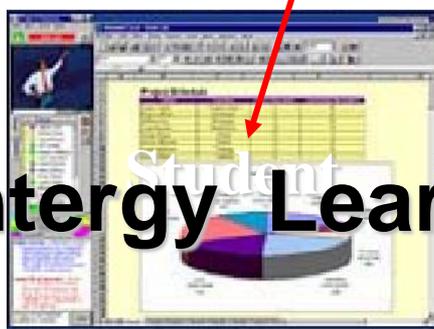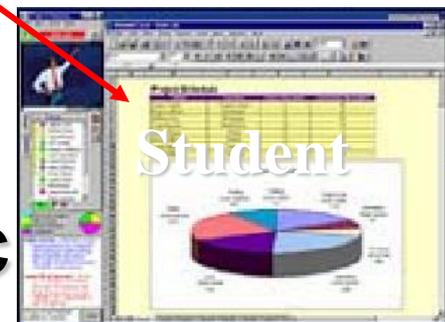
Introduction to eBusiness

- **Fall 2000: Tuesday night from 6:30-8:30 pm**
  - 50 On Campus Students
  - 75 Off Campus Students
    - IBM, Ford, GE, Lockheed Martin, Pratt and Whitney, Ford, Consolidated Edison, NY Power, J. P. Morgan, Carrier, Otis, etc.
  - Extensive Website:
    - http://www.jackmwilson.com/eBusiness/Syllabus-Spring2001/
  - MBA, MSIT, MS
  - miniLectures, Discussion, Student presented cases, & asynchronous interactions
- **Spring 2001: 75 overflow students (25 on and 50 off)**
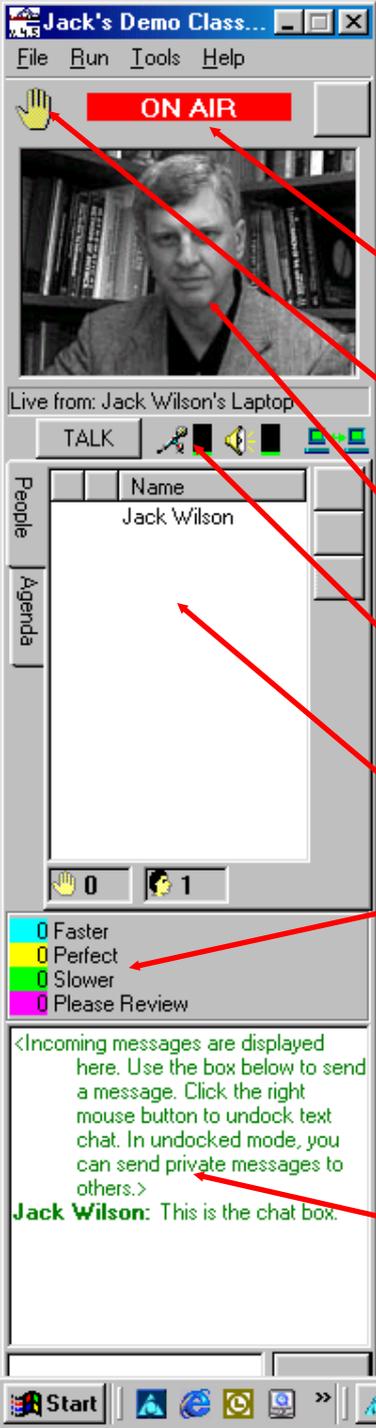
- On-Air indicator
- Raise your hand
- Picture or video of speaker
- Audio and Network controls
- Agenda or class roll
- Feedback section
  – (can be pace, agreement, T/F, Yes/No, etc.)
- Chat Window

Distributed Cognition

- **The "Client-Server" model.**
- **Connecting students, instructors, and resources into a rich interacting community of learners.**
- **Peer Teaching**
- **Cooperative Learning**
- **Student-student as well as student-instructor and student-resource interactions**
- **Synchronous as well as asynchronous**
- **Video/Audio/ and Multimedia interactions**
- **The real "World Wide Web"**

Test: 2/29/2000 Employee Orientation Test

This test uses the Orientation Test Template

Testing Options

☑ Limit test to 60 minutes

☐ Random question order

Number of times student can take test: [2 ▼]

Students can access this test...

☐ Starting

Month	Day	Year	Time
[2 ▼]	[29 ▼]	[2000 ▼]	16:24

☐ But not after

Month	Day	Year	Time
[3 ▼]	[1 ▼]	[2000 ▼]	16:24

Grade Posting Options

○ Don't show results
○ Show final grade only
○ Show grades by question
◉ Show grades and answers

Show results after:

Month	Day	Year	Time
[2 ▼]	[29 ▼]	[2000 ▼]	16:24

☐ Review grades before posting

[Publish]   [Cancel]

Test: Office 2000 Overview

Karen Ling

Question	Correct Answer(s)	Student's Answer(s)	Points Available	Points Awarded
Microsoft Office 2000 includes which of the following standard software applications?	1. Word 2000	1. Word 2000	20	20
	2. Excel 2000	2. Excel 2000		
	4. FrontPage 2000	4. FrontPage 2000		
The "desktop" is a metaphor used to represent an important part of your computer's graphical user interface (GUI).	True	True	20	20
The Microsoft Office 2000 software application that you can use for word processing is called	Microsoft Word Word	Word	20	20
. Microsoft Excel, another Office 2000 software application, is used to create	spreadsheets forms graphs	graphs		
. To create your corporate intranet site, you could use	Microsoft FrontPage FrontPage	FrontPage		

TESTLINC **LearnLinc** TESTING AND ASSESSMENT

Folder List

Virtual Campus

Help

Test: Office 2000 Overview

Click a student name to review individual test results.

Student	Date/Time Completed	Duration of Test (minutes)	Total Points	Awaiting Grade	
Arman Stattic	3/2/00 9:13:37 AM	1	80	No	Delete Result
Bernice Campollini	3/2/00 9:37:12 AM	5	60	No	Delete Result
Brian Mann	3/2/00 9:22:39 AM	8	100	No	Delete Result
Jude Sages	3/2/00 9:41:10 AM	1	80	No	Delete Result
Karen Ling	3/2/00 9:38:47 AM	0	100	No	Delete Result
Pamela Fraser	3/2/00 9:29:51 AM	2	73	No	Delete Result
Rumi Platek	3/2/00 9:42:58 AM	0	100	No	Delete Result

[Done]   [View Statistics]

Powered by **LearnLinc**

Distributed Cognition

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[Publish]   [Cancel]

Ten Commandments of TEL

1. **Restructure around the learner.** Neither over-emphasize nor under-emphasize technology.

2. **Build upon research results**, which inform design; don't try to reinvent the wheel.

3. **Remember that technology has an intrinsic educational value** beyond helping students learn better.

4. **Do systematic redesign and not incremental add-ons.** Do not automate the lecture. There is always a tendency to just add on a few computer experiences to everything else. By definition this costs more, is more work for faculty, and adds to the students' burden. An innovative approach changes rather than adding poorly integrated exercises.

5. **Benchmark your plans** and build upon examples of systematic redesign. Find the best examples and build upon them.

Ten Commandments of TEL

6. Count on Moore's law **("What is hard today is easy tomorrow"). Eg., CPU power and bandwidth relentlessly double.**

7. Cost is an important aspect of quality**. There is no lasting quality if there has been no attention to cost. There are more than enough examples of expensive high quality solutions. We need more examples of inexpensive high quality solutions!**

8. Avoid pilots that linger**. Design for a large scale and pilot projects only as a prelude to scaling up. It is easy to design innovative educational experiences that work for small groups. It is harder to address the needs of the 1000 students taking calculus I at the large research or comprehensive university.**

9. **Develop a** balance between synchronous and asynchronous **distributed learning.**

10. There is no longer any way to do good scholarship without technology, and there is no longer any way to teach good scholarship without technology.

UMASS

Jack M. Wilson

http://www.UMassOnline.net

The End