

## Changing the Paradigm of Education to meet the Growing Demand for New and Emerging Technologies

Dr. Jack M. Wilson, President  
The University of Massachusetts and  
Formerly CEO of UMassOnline.net

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## What shapes my views

- Formerly
  - Vice President for Academic Affairs
  - Provost
  - Dean of Faculty
  - Dean of Undergraduate Ed.
  - Dean of Professional Ed.
  - Director, Center for Innovation in Undergraduate Ed.
  - Chair, Physics Department
  - Professor for 30 years +
  - Entrepreneur and Founding Chairman of Public Comapany.

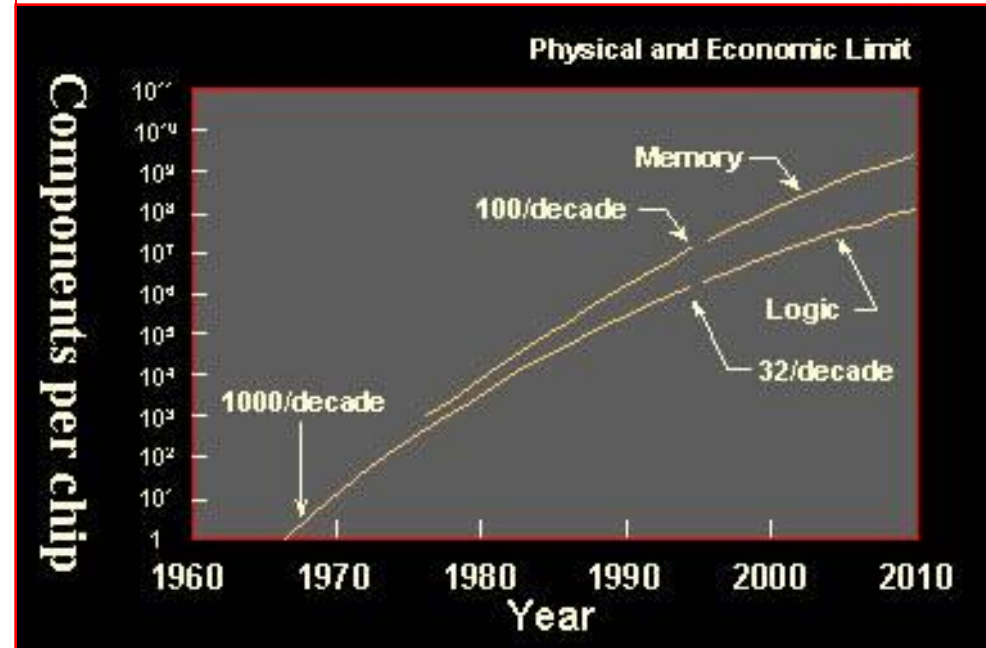
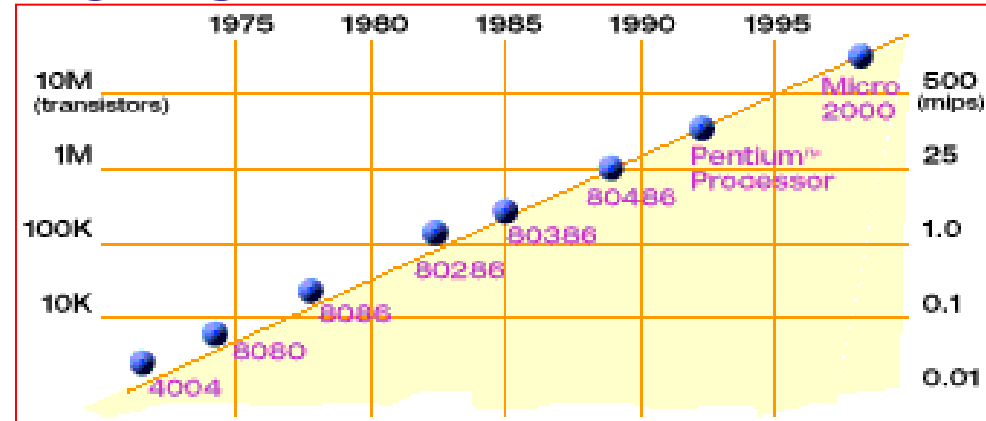
## A personal journey

- Began career as a research physicist
- Research required high performance computing
- Why are students not learning about this (MUPPET)?
- How can this help learning?
- Restructuring physics and engineering ed.(CUPLE)
- Computing Communication Cognition ->  
The Studio Classroom
- How must Universities Change?
- Restructuring Undergraduate Program
  - Hesburgh Award, Boeing Award, Pew Prize
- How can the studio experience work at a distance?
  - LearnLinc Corporation
- How can online programs serve the needs of working professionals.
  - UMassOnline RSVP

## I. Wilson's Favorite Laws!

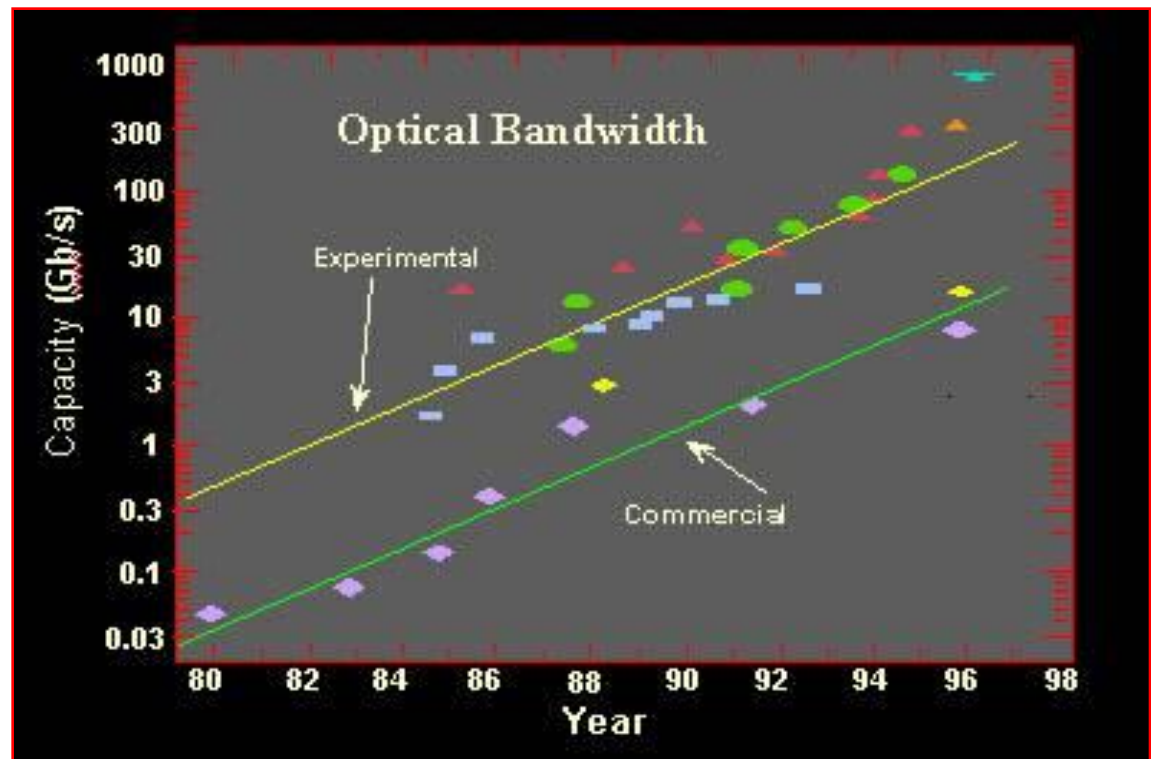
### I. Moore's Law:

- CPU performance doubles every 18 months.
- Cost of equivalent computing power halves
- Basic physics drives this.
  - CMP, etc.



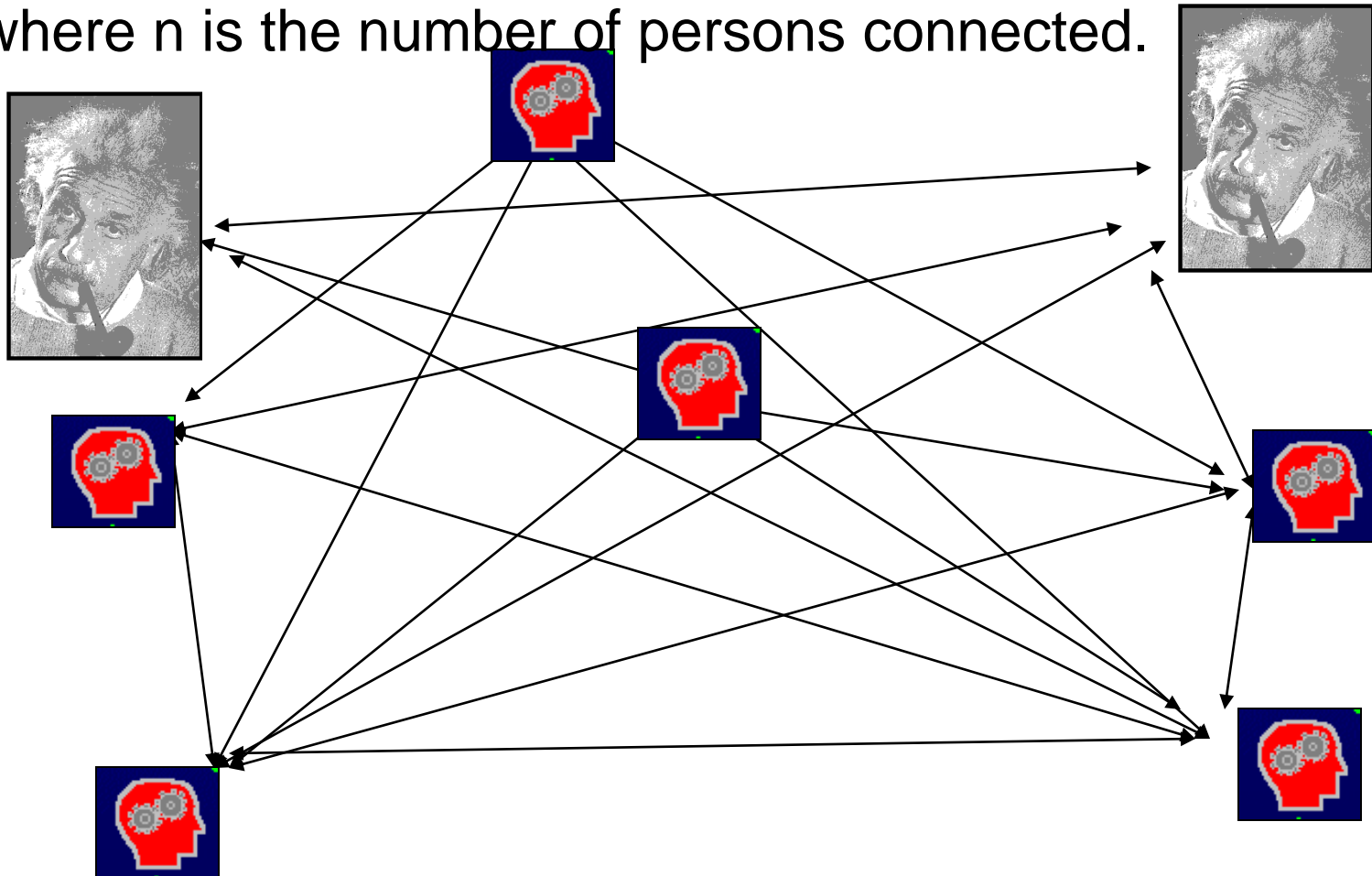
## II. Wilson's Favorite Laws!

- II. Bandwidth law:  
Bandwidth is doubling even faster!



### III. Wilson's Favorite Laws!

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



## The horrible mismatch

- People change very slowly
- Technology changes very rapidly
- Do you feel like you are herding cats?



## The Forty Year Degree

- In a discussion [\*] with Christopher Galvin, at that time President Motorola:
  - We are not hiring any more graduates with four year degrees. We want employees with **forty year degrees**



\* "National Issues in Engineering Education," AS International Conference on Engineering Education and Practice, Washington, DC, 6/22/96

(note: I was non-plussed to note that a recent national publication used this quote above as a cover title without attribution)



## Maintenance Contract

- Let me put this another way:  
Universities will increasingly be required to provide a **life time maintenance contract** on their degrees.
- This will require the provision of “**Continuous Education**”
- Create a seamless experience from school to retirement.

- **....a states' economic success will increasingly be determined by how effectively they can spur technological innovation, entrepreneurship, education, **specialized skills,** and the transition of all organizations -- public and private -- from bureaucratic hierarchies to learning networks.**
- - Robert Atkinson et. al.; PPI

## Recipe for Economic Success

- Outstanding Educational Institutions
  - K-12
  - Community Colleges
  - Undergraduate Institutions
  - Research Universities
  - Continuous Education Opportunities
- Financial Investment in Innovation

## Recipe for Economic Success

- UMass is partnering with MassInsight Battelle, Mass High Tech Council, AIM, and other industry groups to create an S&T Roadmap for Massachusetts.
- Formed S&T bipartisan Caucus with House Senate, Governor, and Industry.
- Emerging Technology Bill- Senate, House, and Governor.

## UMassOnline

- UMassOnline will end the fiscal year 2003 with
  - over \$12 million in revenues
  - 13,375 enrollments from “new” students
  - an annual growth of nearly 50%
  - 39 (and growing) degree and certificate programs
  - Serving the educational needs of students in Massachusetts, New England, and the U.S.
  - Over 500% growth in inquiries through portal
  - 55% of inquiries from outside Massachusetts.
  - 8% of inquiries from outside the U.S.

## A few successful on-line initiatives

- Arizona Regents University 12,353 Ex
- Univ. of Maryland Univ. Coll. 68,250 New
- Florida Virtual Campus 56,198 Ex
- FL Comm. Coll. D.L. Consortium 85,278 Ex
- Maryland Online: 27,060 Ex
- Georgia Globe: FY2002: 40,000 Ex
- Illinois Virtual Campus: 46,678 Ex
- eArmyU (23 campuses) 12,000 New
- Connecticut D. L. Consortium 9,683 Ex
- UMassOnline 13,375 New
  - Ex=>primarily existing students
  - New=>primarily new online students

– Source: Center for Academic Transformation meeting

## For-profits

- Phoenix 37,000 / 110,000
- Capella 5,000 / 5000
- DeVry ? / 56,000
- Strayer ? / 14,000
- Sylvan (NTU) ?
  - (Walden U, NTU, Canter, Caliber, iLearning, etc.)

## A robust enterprise

- During the 12-month 2000–2001 academic year, **56 percent** (2,320) of all 2-year and 4-year Title IV-eligible, degree-granting institutions offered distance education courses for any level or audience,
  - (i.e., courses designed for all types of students, including elementary and secondary, college, adult education, continuing and professional education, etc.)
- **Twelve percent** of all institutions indicated that they planned to start offering distance education courses in the next 3 years;
- **31 percent** did not offer distance education courses in 2000–2001 and did not plan to offer these types of courses in the next 3 years.
  - Source: U.S. Department of Education, National Center for Education Statistics. *Distance Education at Degree-Granting Postsecondary Institutions: 2000–2001*, NCES 2003-017, by Tiffany Waits and Laurie Lewis.



## Public vs Private

- Public institutions were more likely to offer distance education courses than were private institutions. In 2000–2001,
  - **90 percent** of public 2-year and
  - **89 percent** of public 4-year institutions offered distance education courses, compared with
  - **16 percent** of private 2-year and
  - **40 percent** of private 4-year institutions
- [Source NCES 2003-017]

## Credit Programs

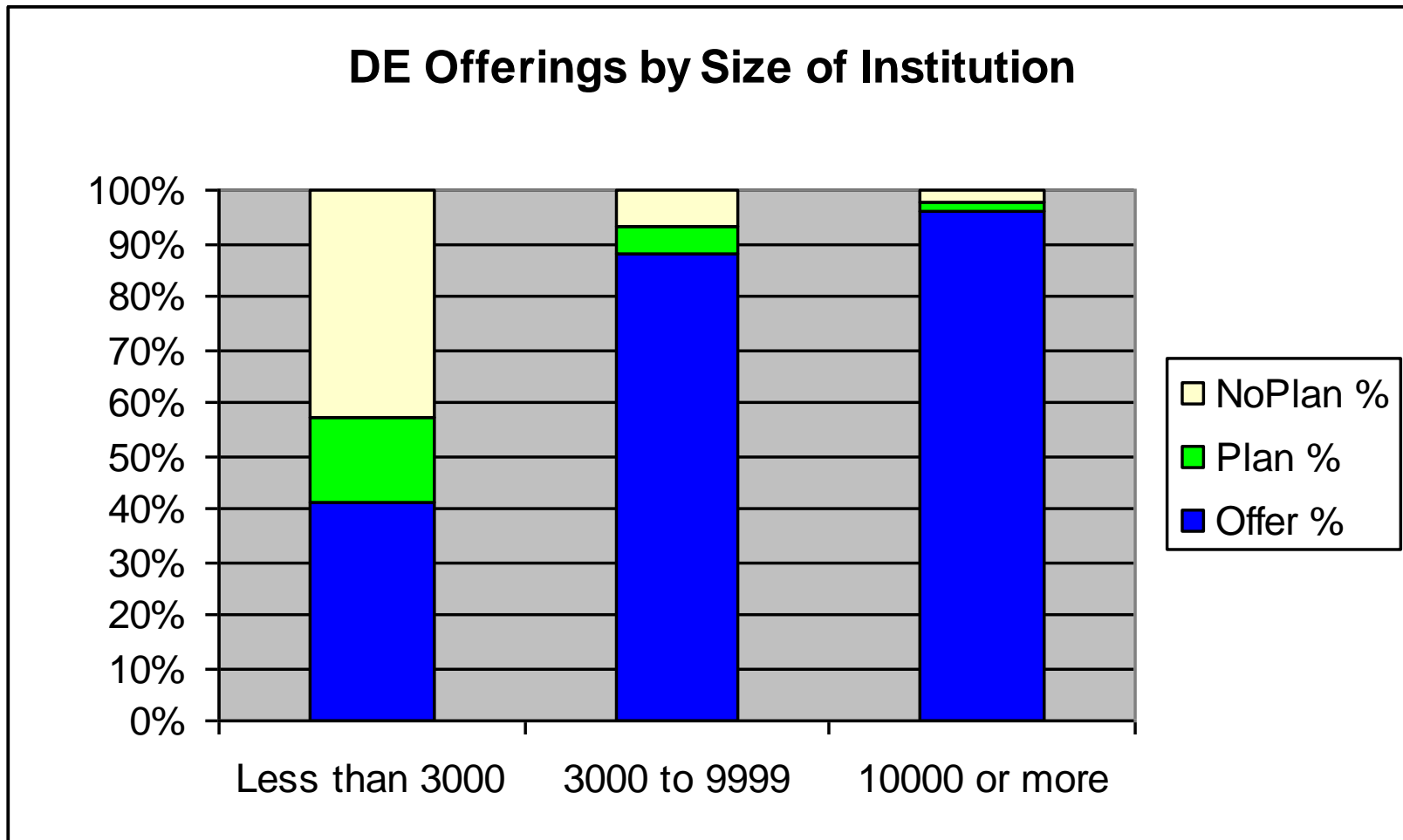
- College-level, credit-granting distance education courses at either the undergraduate or graduate/first-professional level were offered by **55 percent** of all 2-year and 4-year institutions (table 3).
- College-level, credit-granting distance education courses were offered at the
  - undergraduate level by **48 percent** of all institutions, and at the
  - graduate level by **22 percent** of all institutions.

– [Source NCES 2003-017]

## Enrollments

- In the 12-month 2000–2001 academic year, there were an estimated **3,077,000** enrollments in all distance education courses offered by 2-year and 4-year institutions
- There were an estimated **2,876,000** enrollments in college-level, credit-granting distance education courses,
  - with **82 %** of these at the undergraduate level (figure 2).
- Consistent with the distributions of the percentage of institutions that offered distance education courses, most of the distance education course enrollments were in public 2-year and public 4-year institutions.
  - **Public 2-year** institutions had the greatest number of enrollments, with **1,472,000** out of 3,077,000, or **48 %** of the total enrollments
  - **Public 4-year** institutions had **945,000** enrollments (**31 %**), and
  - **private 4-year** institutions had **589,000** enrollments (**19 %**).
    - [Source NCES 2003-017]

## Size Matters the Most



[Source NCES 2003-017]

## Technologies

- The Internet and two video technologies were most often used as primary modes of instructional delivery for distance education courses by institutions during the 12-month 2000–2001 academic year.
- Among institutions offering distance education courses, the percentage using specific technologies are as follows:
  - **90 % asynchronous** computer-based instruction
  - **43 % synchronous** computer-based instruction,
  - **51 % two-way video** with two-way audio
  - **41 % one-way prerecorded video**
  - **29 % CD-ROM**
  - **19 % multi-mode** packages.

– [Source NCES 2003-017]

## Technology Futures

Percent that indicated plans to **start using or increase** the number of Internet courses using a specific technology as a primary mode of instructional delivery for distance education courses

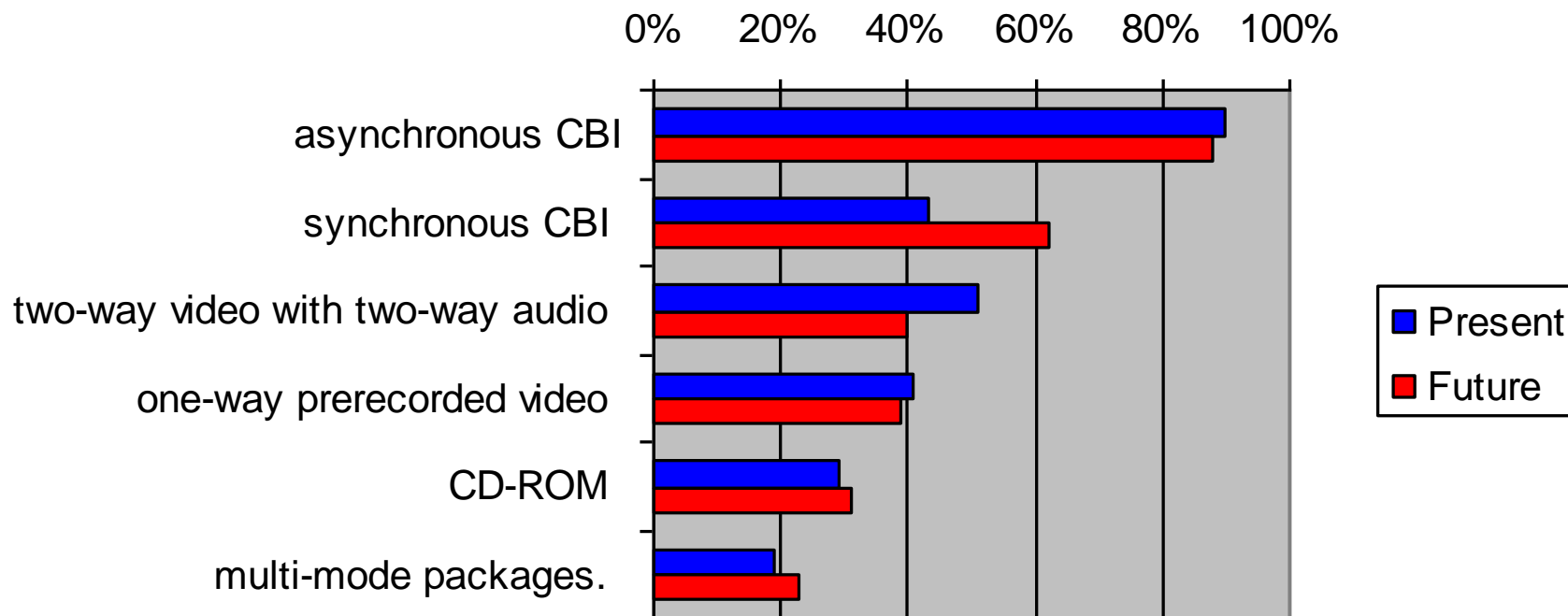
- 88 % asynchronous computer-based instruction
- 62 % synchronous computer-based instruction
- 40 % two-way video with two-way audio,
- 39 % CD-ROMs
- 31 % multi-mode packages.
- 23 % one-way prerecorded video.

[Source NCES 2003-017]

## Growth and decline in technologies

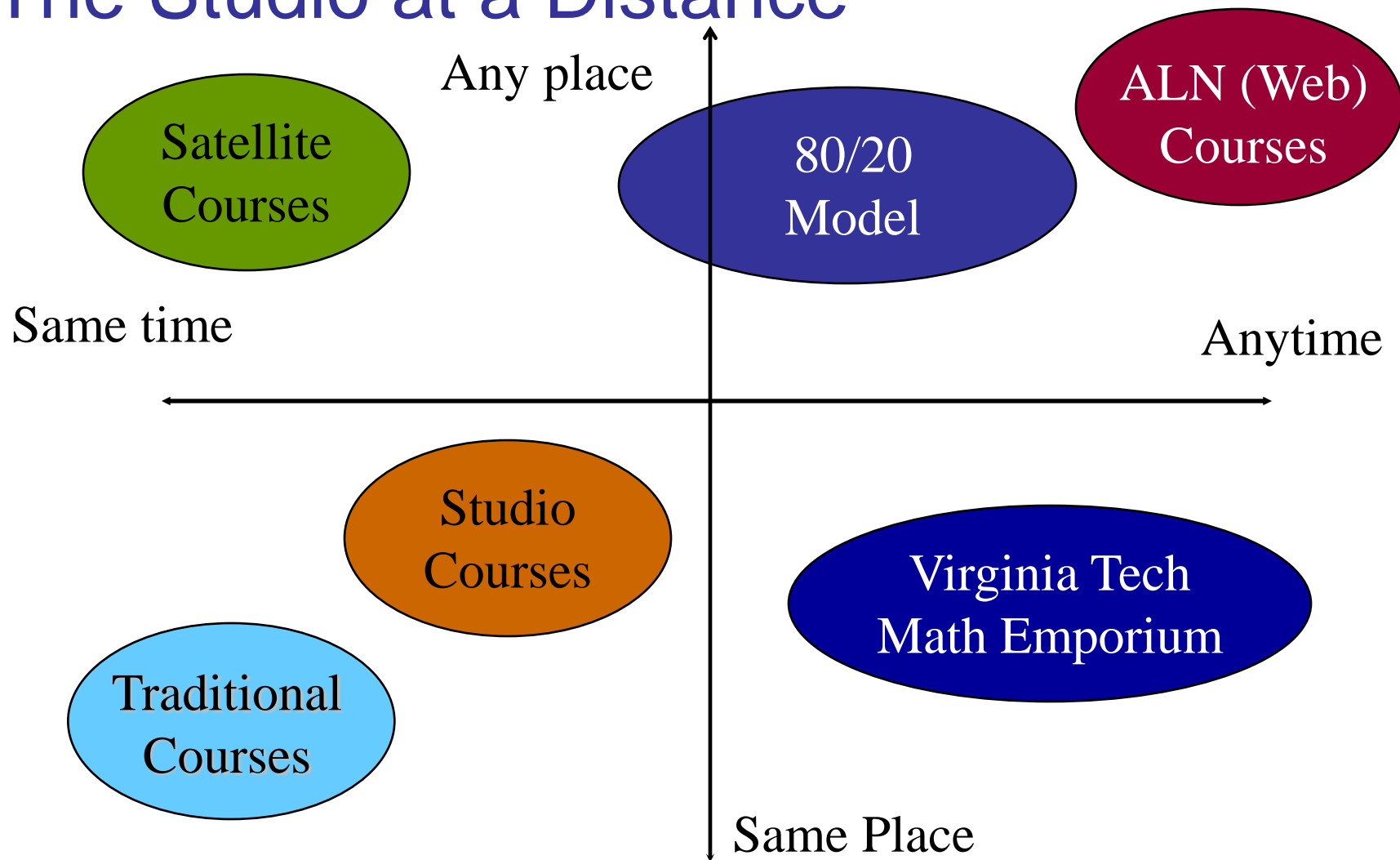
### Technologies- Present and Planned

(Data source NCES 2003-017)



[Source NCES 2003-017]

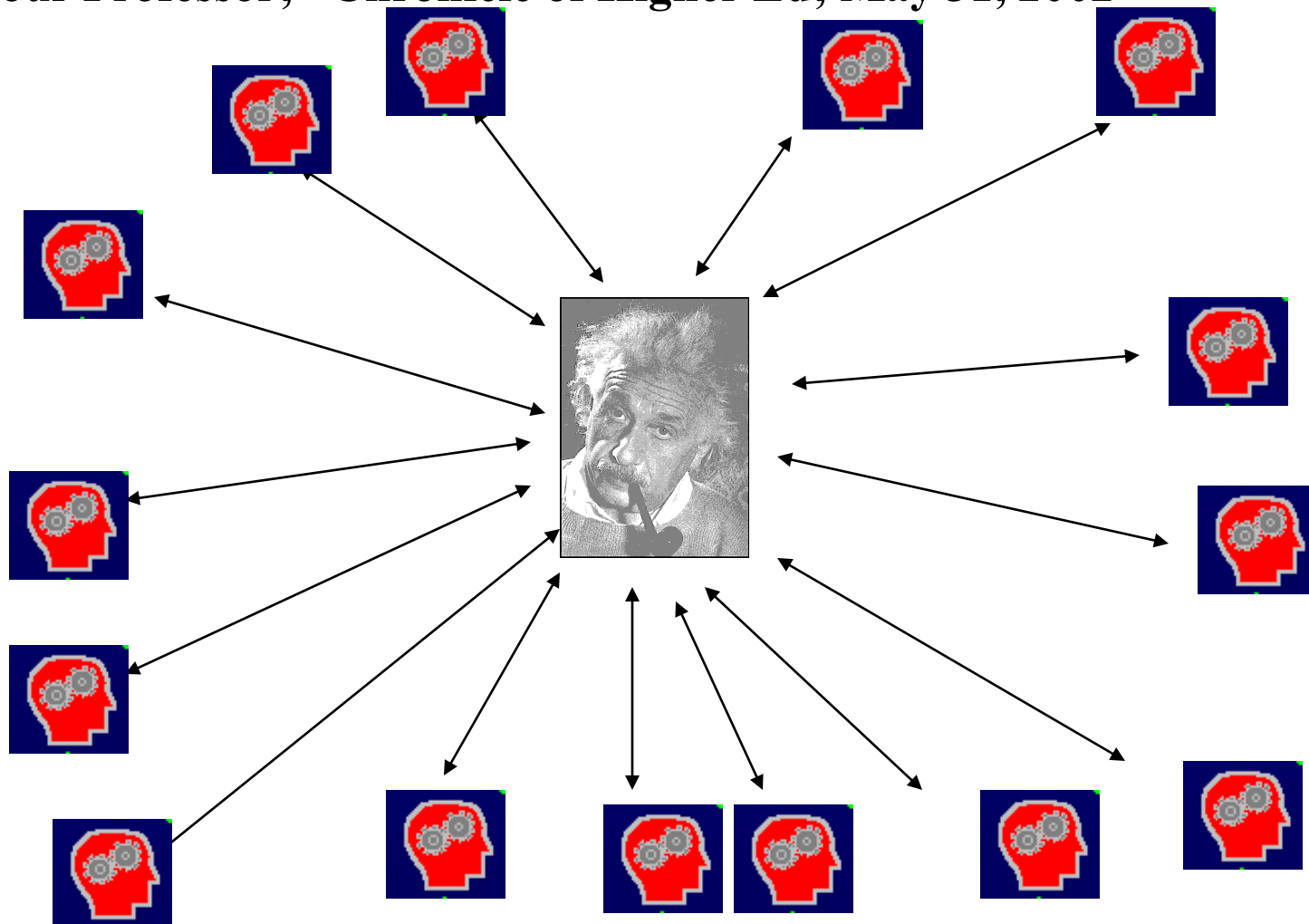
## The Studio at a Distance



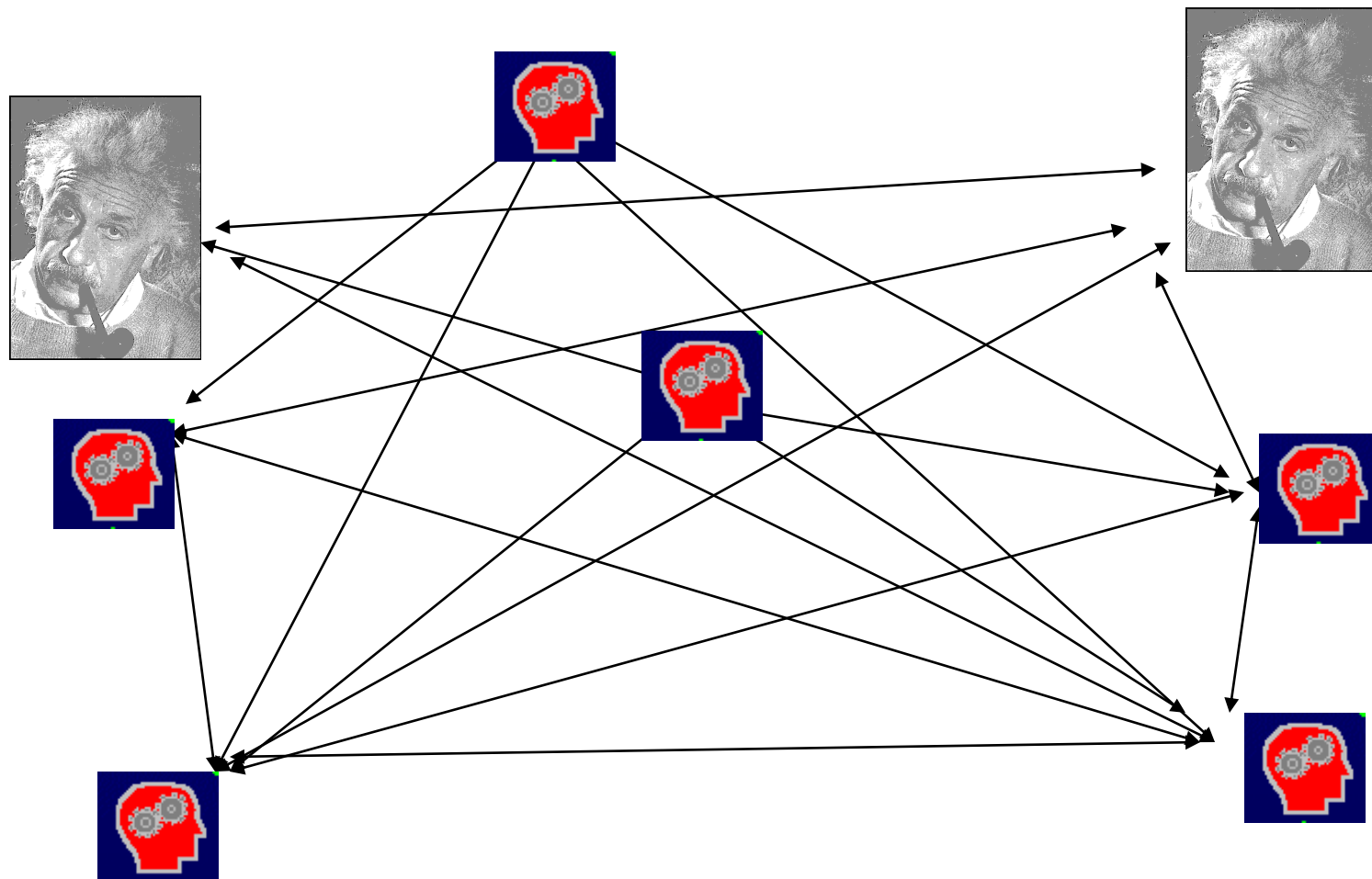


## Usual On-line course organization

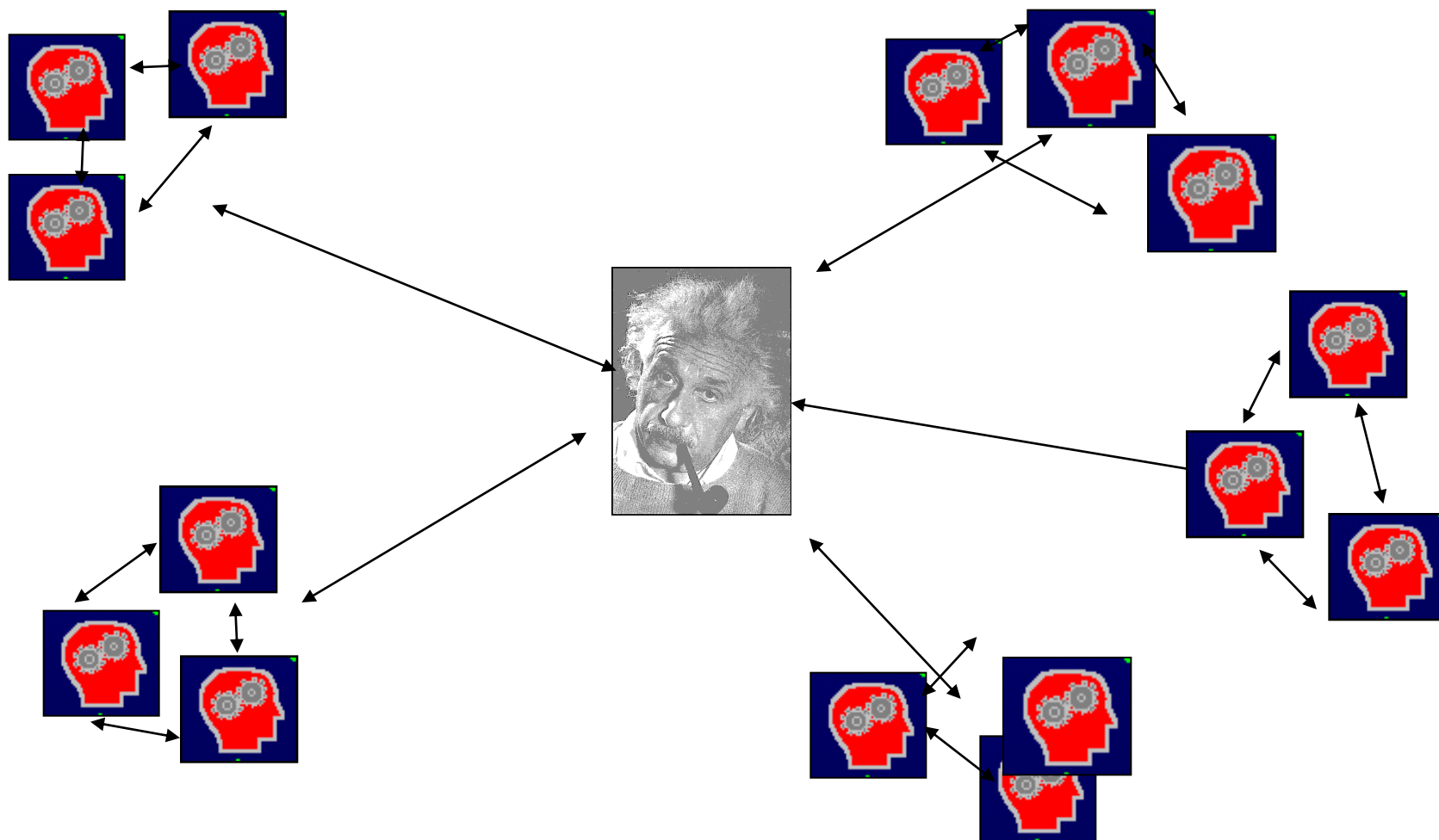
“The 24-Hour Professor;” Chronicle of Higher Ed; May 31, 2002



## Distributed Collaborative On-line Model



## Collaborative Learning, Peer Learning.....



## WHY?

- Cited as very important:
  - *increasing access to new audiences* -65%
  - *increasing institution enrollments* - 60%
  - *reducing per-student costs* – 15 %
  - *improving quality of course offerings* - 57 %
  - *meeting the needs of local employers* - 37 %

[Source NCES 2003-017]

## Succeeding?

- In general, institutions reported that most of the goals they considered to be important for their distance education programs were being met to a moderate or major extent.
  - Increasing student access by making courses available at convenient locations was reported to have been met to a major extent by **37 percent** of institutions that considered it an important goal, and
  - increasing student access by reducing time constraints for course-taking was reported to have been met to a major extent by **32 percent** of institutions that considered it an important goal

[Source NCES 2003-017]

## Thank you!

Jack M. Wilson,  
President The University of Massachusetts  
Formerly CEO, UMassOnline

[www.UMassOnline.net](http://www.UMassOnline.net)

[www.JackMWilson.com](http://www.JackMWilson.com)



## What shapes my views?

- Service as:
  - Founding Chief Executive Officer (CEO) of UMassOnline
  - 33 years as a professor, department chair, research center director, dean ( 4 times), and provost
  - Recently at RPI: J. Erik Jonsson '22 Distinguished Professor of Physics, Engineering, Information Technology, and Management.
- Founder, CEO, Chairman of LearnLinc
  - a successful eLearning Co
  - Now Mentergy Corporation (NASDAQ: MNTE)
  - Sold in February 2000.

## What else shapes my views?

- Industry Consultant (IBM, AT&T, Lucent, Ford, GM...)
- U.S. Army TRADOC Advisory Committee
- Pew Center for Academic Transformation (\$8.8 M)
- One of founders of the National Learning Infrastructure Init.(NLII)
- Chair, NY State Task Force on Distance Learning
- Former Executive Officer of AAPT (Physics) in Wash. DC: 8 yrs on Science Education: HS. and Univ.
- National Acad. of Science/National Research Council
  - Committees on Information Tech., Physics Decadal Overview Committee, and National Digital Library Committee
- Lots of visits, speeches, writing, reading, and visitors