

Open Education

The Engine of Innovation in the 21st Century



**Michael King, Director
IBM Global Education Industry
May 1, 2007**

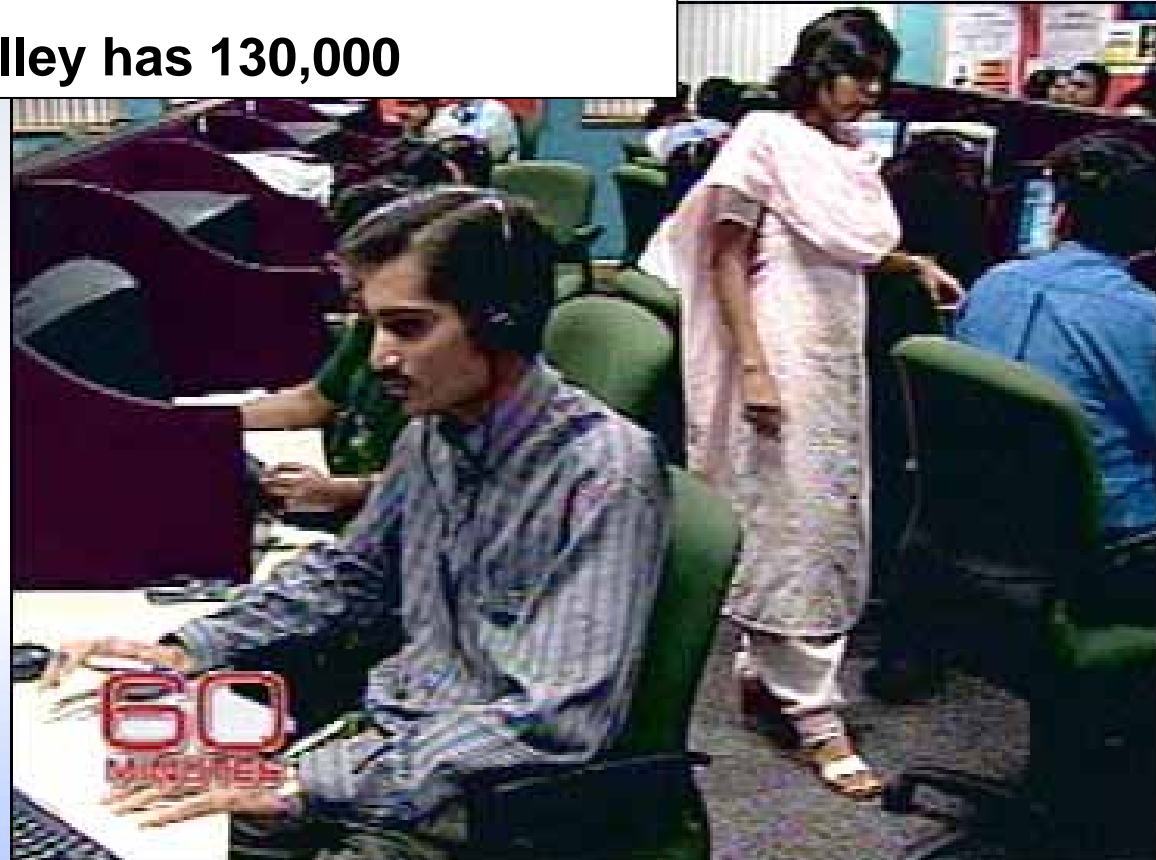
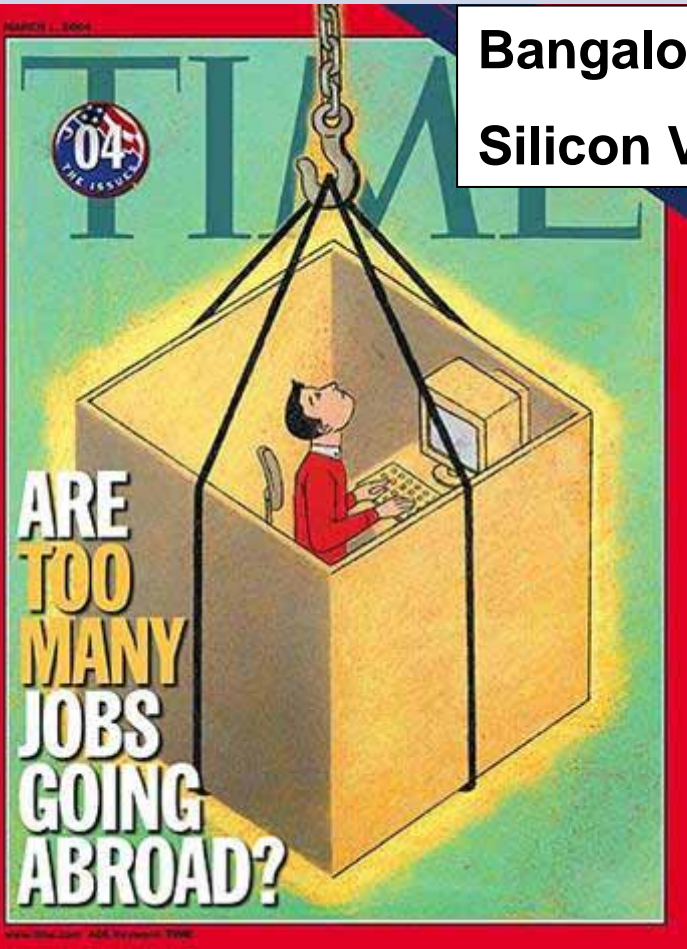


A “Flat World” creates anxiety...

“Silicon Valley Falls to Bangalore”

The Times of India
January 6, 2004

Bangalore has 150,000 IT engineers
Silicon Valley has 130,000



...and opportunity.



To compete and prosper in a flat world, a person needs...

- 1. Skills**
- 2. Access to technology**



Demand for educated professionals is growing faster than populations of people with the required skills.

The coming wave

U.S. alone will need 26% more computer engineers from 2002 to 2012

2010 to 2020, the US, Europe, Japan, China and India will face a shortfall of 32 million well-educated, technically specialized professionals

79 million Baby Boomers who are running the world's industrial economies will retire between 2010 and 2025

60 percent of the jobs being created today require skills that only 20 percent of U.S. workers possess

Number of people aged 15-64 will fall 7% in Germany, 9% in Italy and 14% in Japan by 2025

Wage inflation in Bangalore is close to 20%, and job turnover is 40%

America's "leaky pipeline" -- 8 out of 10 ninth graders will not earn Associate's or Bachelor's degree.



For every 100 ninth graders...



...68 graduate on time



Of those, 40 enroll in college



Of those, 27 are still in college the following year



Of those, 18 earn an Associate's degree within 3 years or a Bachelor's degree within 6 years

Source: "American Higher Education: How Does It Measure Up for the 21st Century?" (May 2006), The National Center for Public Policy and Higher Education, Courtesy of Milken Institute

Other pressures weigh on Education.

Globalization

- Increased demand for skills and delivery capacity of Education
- Focus on economic development
- Growing size and complexity of research projects

Performance & Accountability

- Focus on learning outcomes
- Greater accountability
- Need for operational efficiency
- Constituents and leaders need better insight to data and performance measures

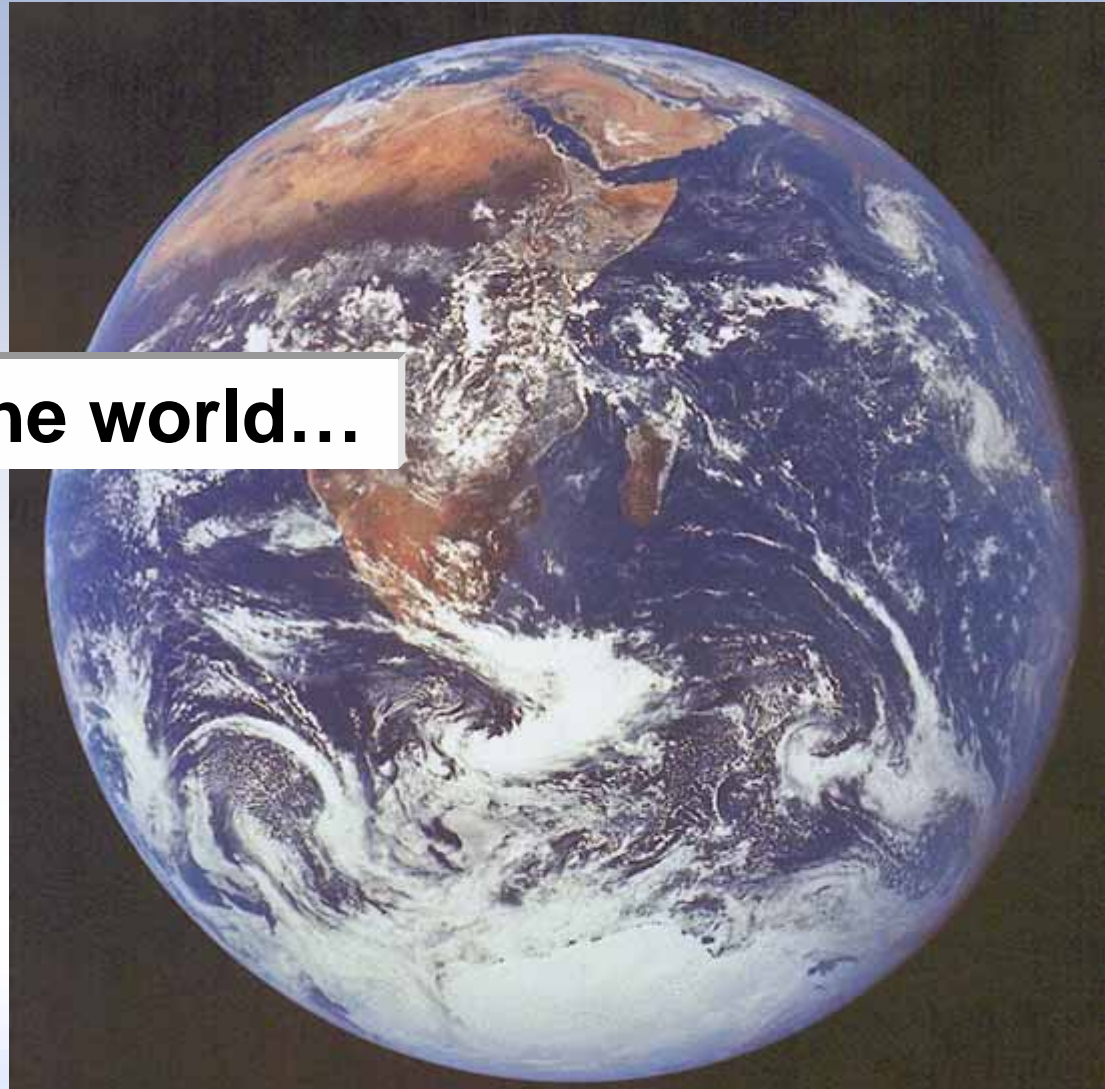
Safety & Security Concerns

- IT security and privacy are major concerns
- Disaster preparedness and recovery more important with more tech-dependence
- Ensuring and monitoring physical safety

Education Industry

Changing Student Needs

- The digital generation has heightened technological expectations
- Student populations are growing and diversifying in terms of ethnicity and age
- There is growing need for lifelong learning



The weight of the world...

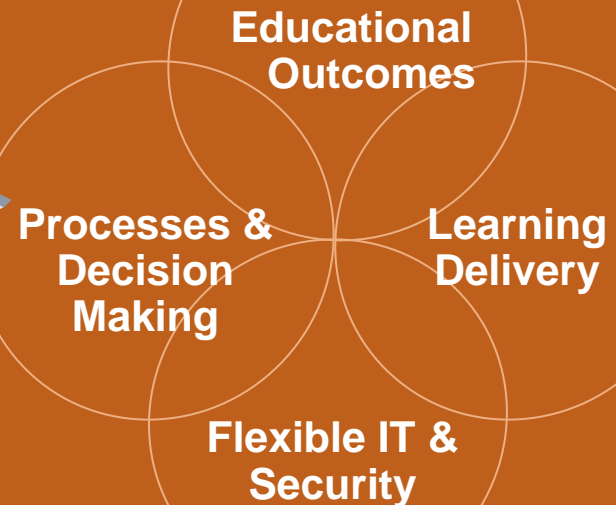
5,972,000,000,000,000,000,000 metric tons

Innovation is key for Educators to meet society's expectations and fulfill their own missions.

- Student Consumers
 - Increased Accountability
 - Changing:
 - Demographics
 - Technology
 - Faculty Roles
 - National Competitiveness, Life Long Learning
- Do more with less!**

Innovation

Future of Learning



But can technology live up to its promise?

Thwarted Innovation

What Happened to e-learning and Why

by Robert Zemsky and William F. Massy



- E-learning hype: “build it and they will come”
- Weaknesses in technology and ICT infrastructure are roadblock to innovation in learning
- Lack of a “dominant design for eLearning”
- Eventually a center of gravity emerges
- Utterback: a “dominant design”

Technology will enable *Innovation* by becoming more open and flexible.

The Education Community is embracing Open Source Applications

- Expand customer choice
- Increase standardization and interoperability
- Enable community innovation

“Open Education”

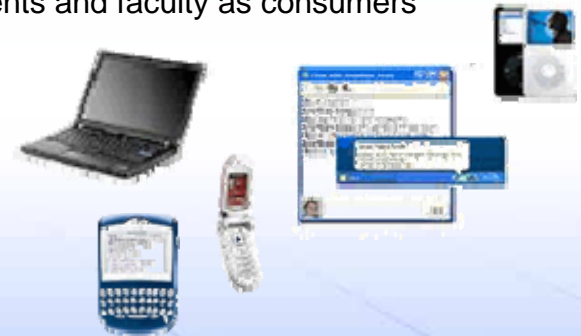


SOA

Web

Consumer IT will drive expectations

End user devices are ubiquitous and diverse
 Web 2.0 and SaaS options proliferate
 Students and faculty as consumers



TCP/IP

Open Standards are driving into applications

- Increase flexibility
- Improve investment protection
- Speed responsiveness



Unix



Why open?

Open technologies and standards are critical for the innovation necessary to educate children and adults for the 21st century's opportunities.

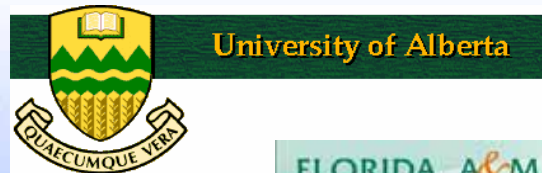
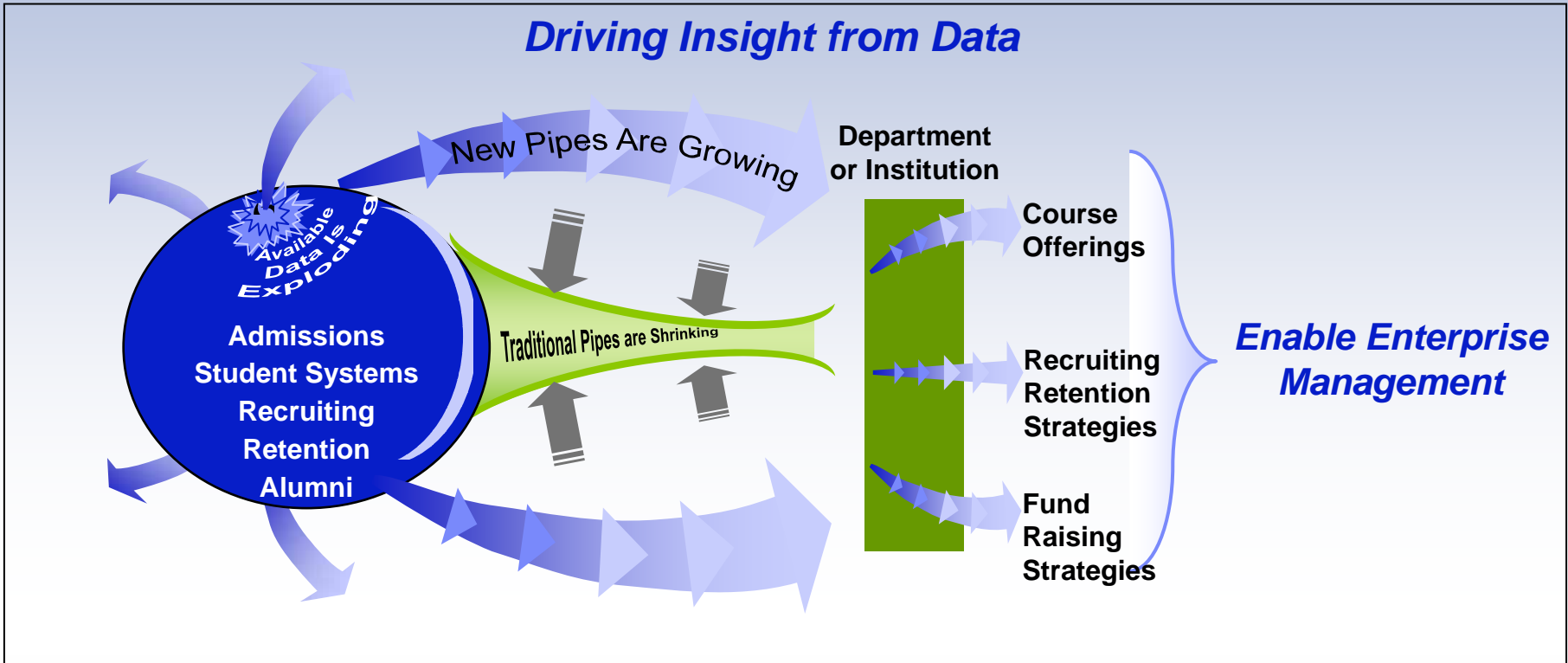
Imagine education interconnected

- Every student's record and portfolio follow the student
- People routinely learn outside the classroom
- Parents and communities join the learning environment
- Life-long learning is integral to careers
- Forms and reports are processed quickly and inexpensively
- Teachers, learners and administrators collaborate easily across vast distances
- Developers create applications we cannot imagine today



Implement and integrate modern systems to improve services and performance.

Driving Insight from Data



Open technology spurs innovation.



Change From “Control”



To “Sustained Value Add”

- Own standard
- Own customer relationship
- Control pace of development
- Control price

- Leverage network effects
- Leverage economy of scale
- Increase availability of skills
- Speed of innovation



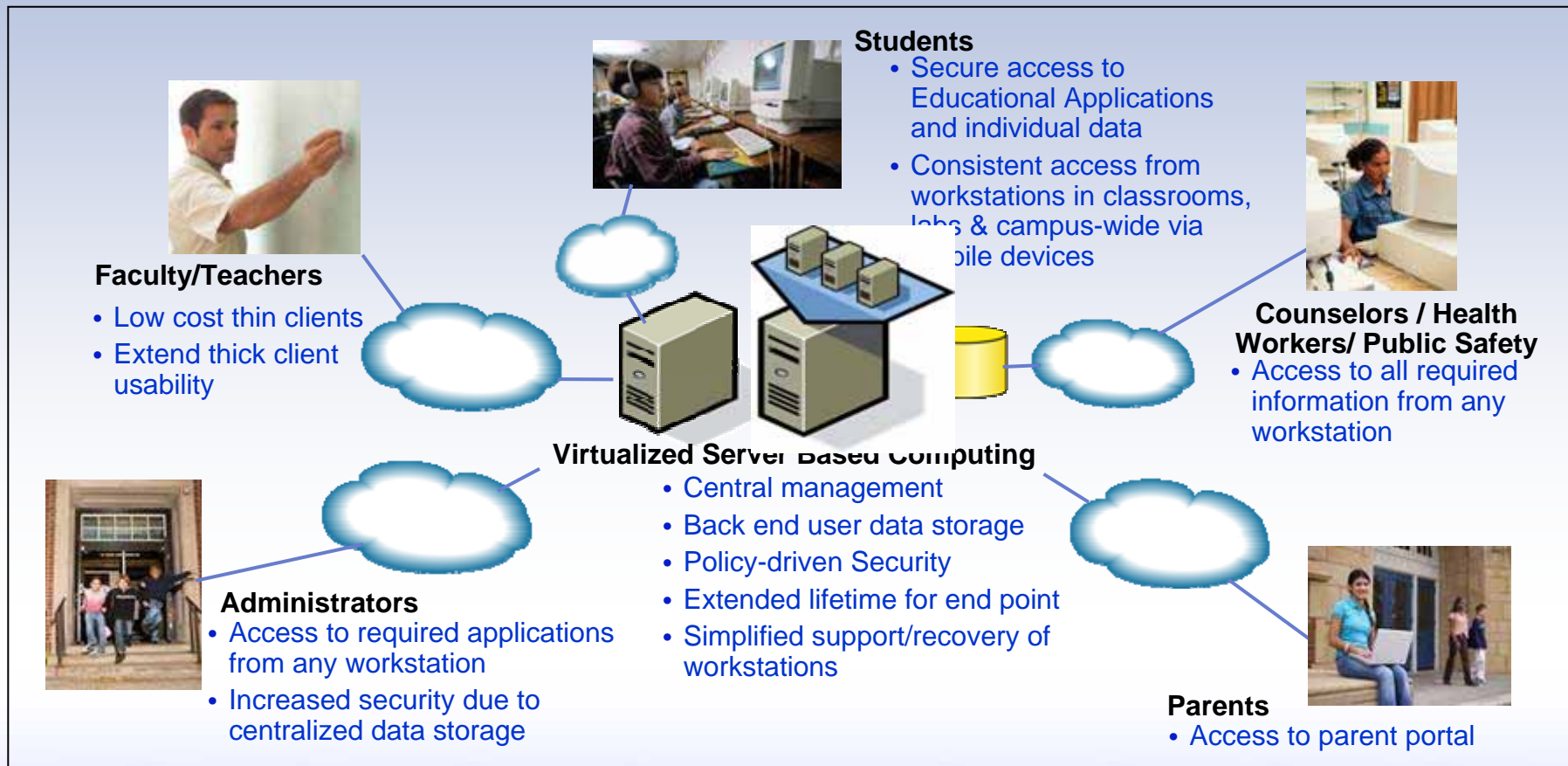
MARIST COLLEGE



RICE UNIVERSITY

Next Generation Student Access – Making the Connection

Virtualization builds on wireless infrastructure



Using the next generation of learning technology to transform education...

Web 2.0

- **Open** (Services, Content, Source, Standards, Formats)
- **Read / Write web**
- **Social Networks**
- **Microcontent**
- **Web Services / Open APIs**
- **Mashups**
- **Radical Specialization**
- **Dynamic Adaptability**
- **Microformats**
- **Continuous presence**
- **Internet as a platform**



Learning 2.0

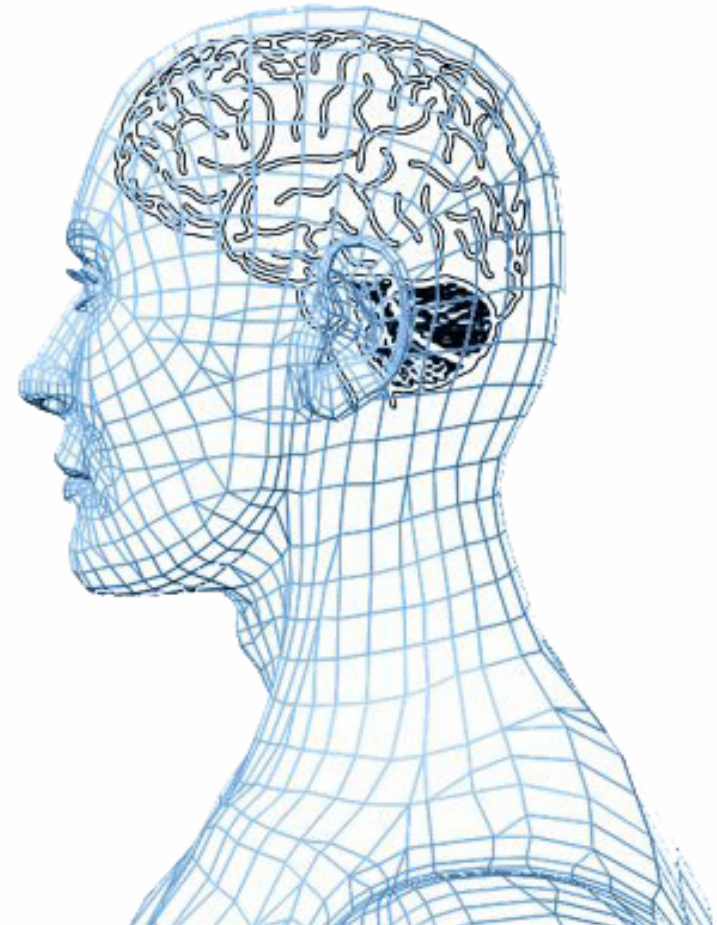
- **Learner centric**
- **Learner centered design**
- **Learner is a contributor**
- **Learning silos are broken down**
- **Distributed model of knowledge and learning**
- **Learning is syndicated passion**
- **Peer-based learning**
- **Interest-based communities of co-creation**
- **Social life of learning**
- **Learning ecologies for communities of practice**
- **Unite cognitive, social basis of learning**
- **Unlocking tacit knowledge**

...will help create the open infrastructure for K-80 learning

IBM has the vision, expertise, experience and solutions to help educators meet the requirements of students, employers and nations in the global economy.

IBM has all three:

- A long track record of supporting education
- Deep knowledge of education, business and technology
- The broadest array of best-in-class services and products.





Questions?

mdking@us.ibm.com

Back-up Charts

IBM's Vision for Transforming Education

- Implement Open Learning in the institution to align resources and support Education outcomes
- Improve and streamline operations and reduce costs by implementing new Administrative processes
- Develop a flexible and secure Infrastructure to support learning and administration
- Enable Innovation in Research



IBM is fostering the vision

...by working with standards organizations and enabling our middleware



...by building an ecosystem of technologies that support the vision



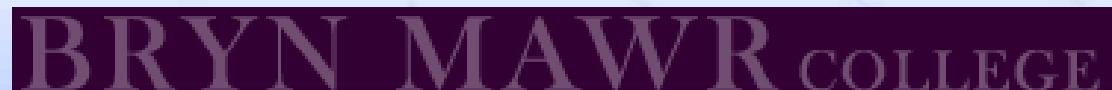
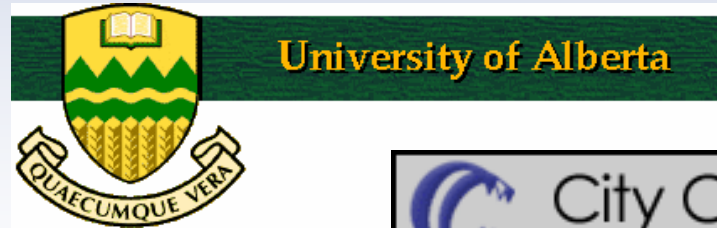
...by creating innovative business, IT, and incremental offerings



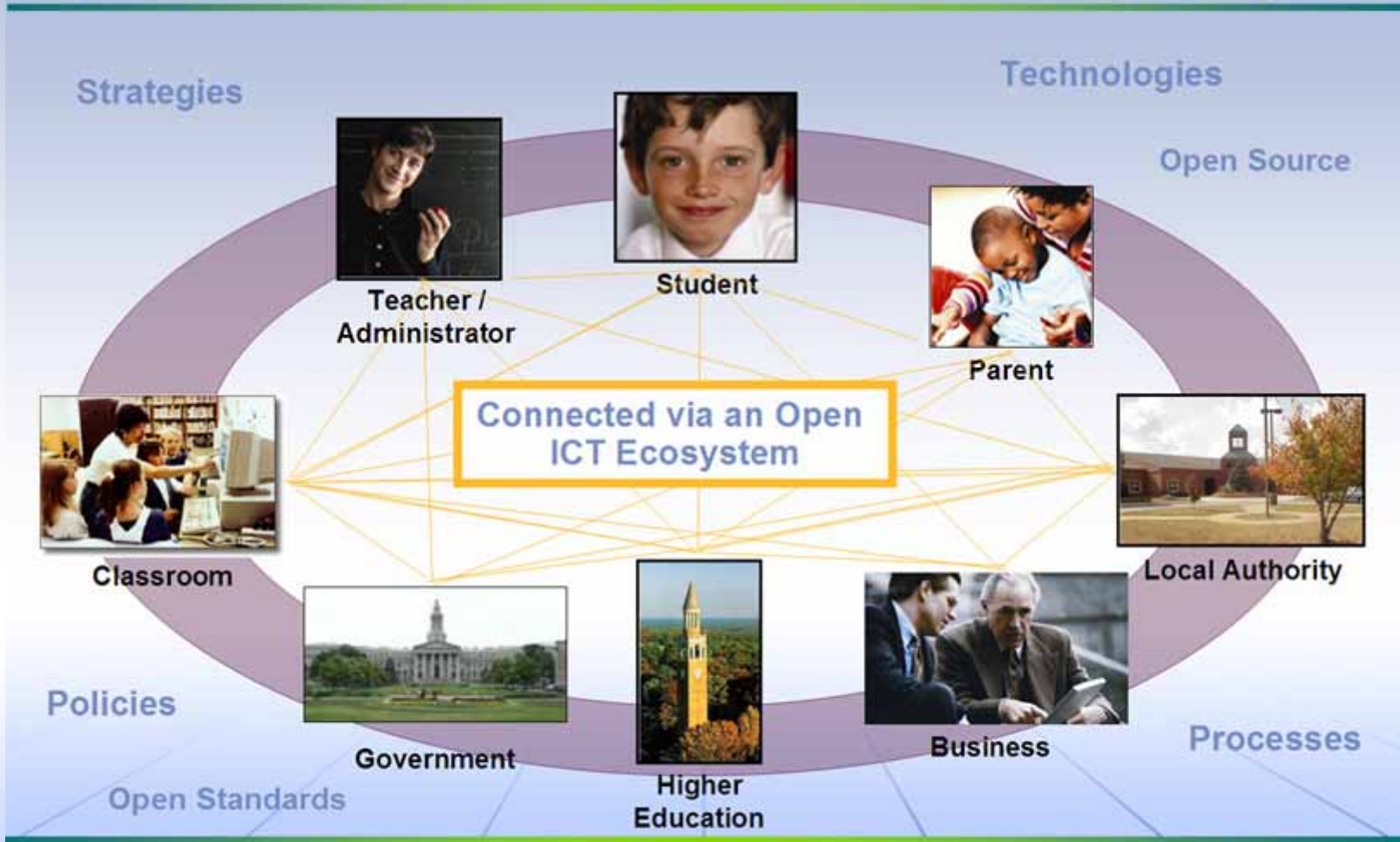
MARIST COLLEGE



IBM's experience in PeopleSoft Higher Education, for example...



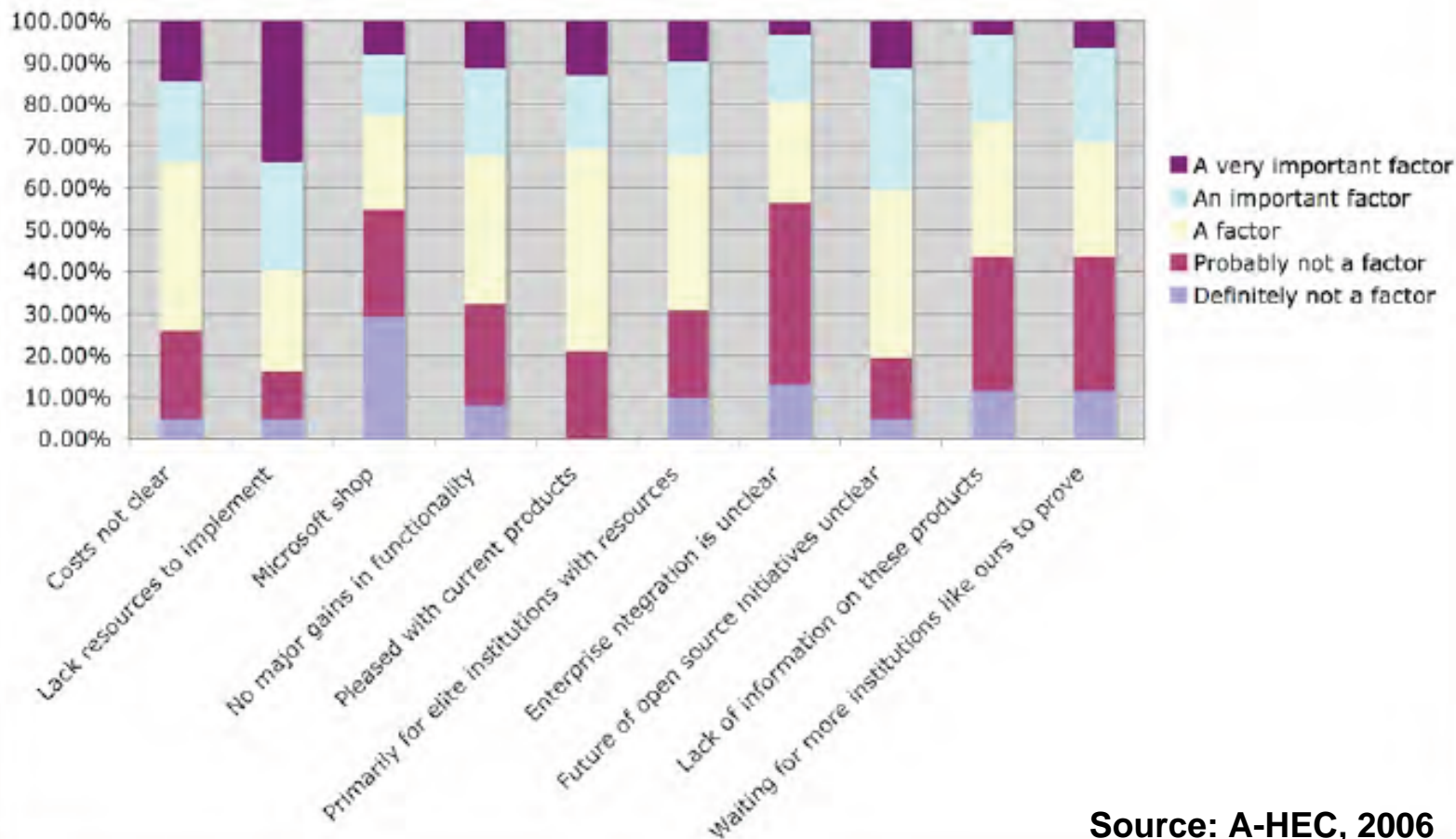
Open Standards are the Mortar for a K80 Learning Ecosystem



Backup: References

Limited IT Resources is the biggest barrier to adoption

Reasons for Not Seriously Considering Open Source Applications to Date:



Source: A-HEC, 2006

IBM's Open Education Roadmap – Our Difference

Leverage Open Technologies to Improve Education

- Service Oriented Architecture
- Open Standards
- Open Source

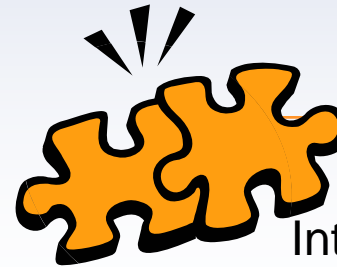


A supporting ecosystem of vendors committed to open standards and platforms

Innovation and enhancements developed by educators for educators



Collaborative learning support tools based on open-source and open standards





Interoperability with other applications used by schools for student administration and other processes



Potential for reduced total cost of ownership

IBM is deeply committed to Education:

Foster Open Technology

- Contribute to infrastructure platforms
- Support “Patent Commons” in Education
- Engage with standards organizations

Contribute to Innovation

- Corporate Community Relations
- Shared University Research grants
- Contribute to Open Source projects

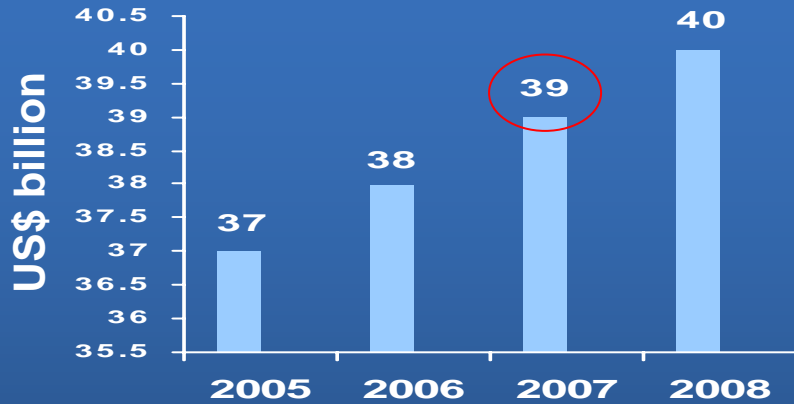


Business and Technology Solutions

- Education and learning consulting services
- Technology and Infrastructure services
- PartnerWorld for Education and learning

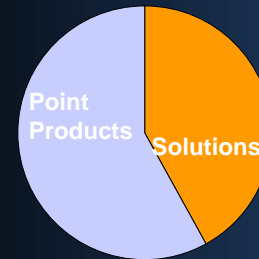
Education Industry IT spend has been driven by student devices, though we see an increase in solution spending.

GMV 2005-2008 CAGR: + 3.2%
(for IBM served markets, large enterprises)

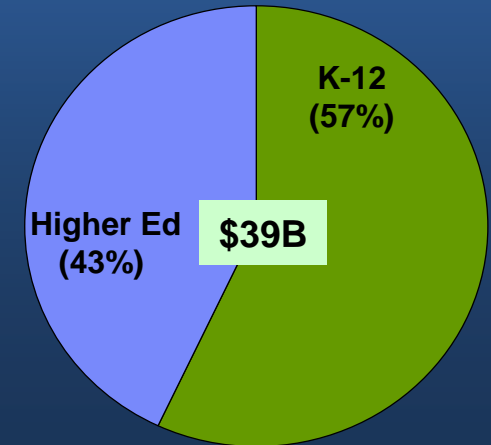
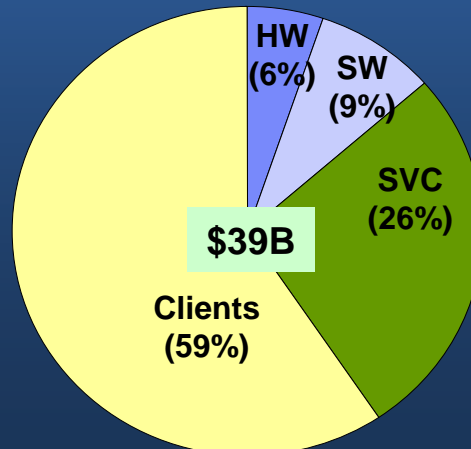
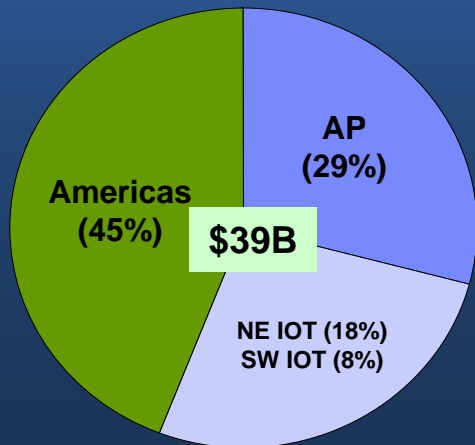


Solutions spend represents 42% of total 2007 GMV opportunity

CAGR	AG	EMEA	AP
Business Solutions	8%	12%	16%
Infrastructure Solutions	14%	20%	25%



SMV1H06, served view, e-size >1000



Top objectives for education IT and business decision-makers

Organization Objectives

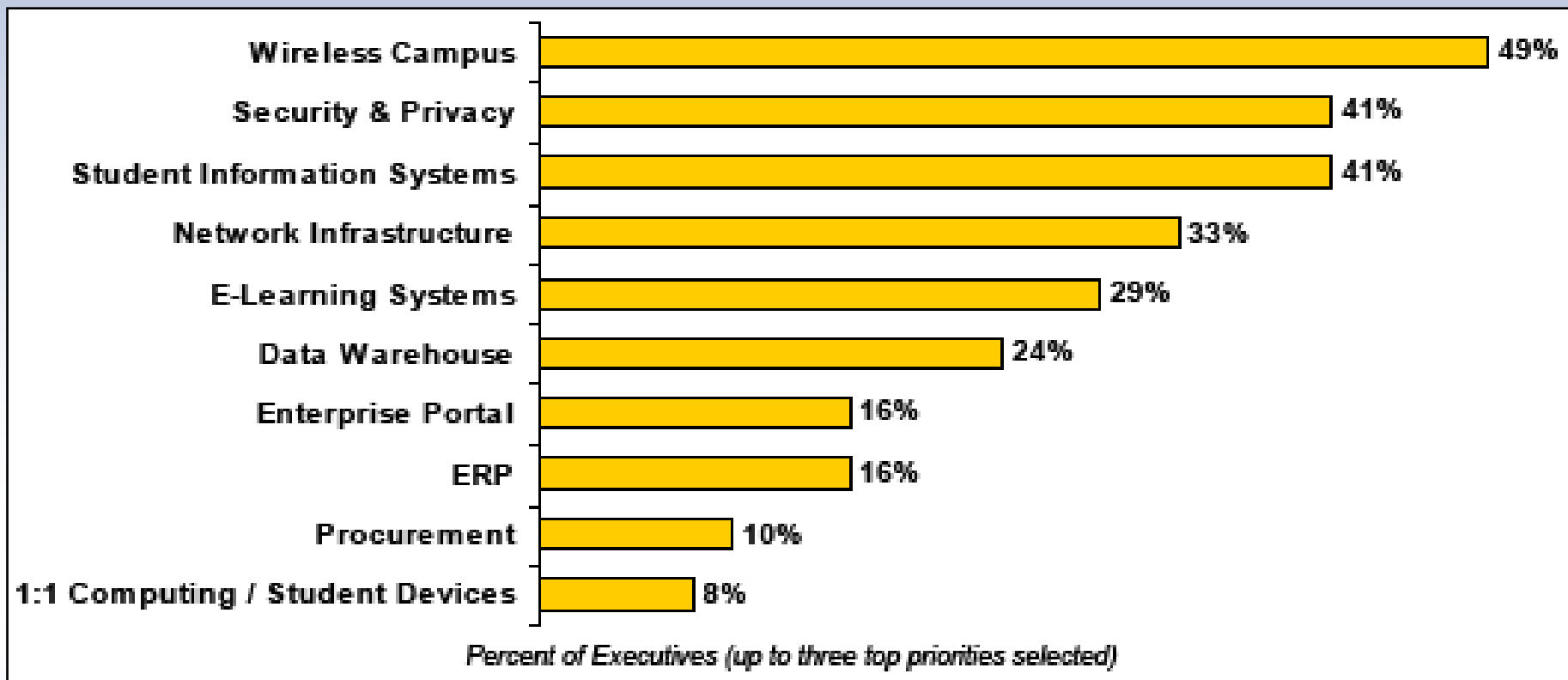
1. Improve operational efficiency
2. Improve employee productivity
3. Improve business processes
4. Reduce administrative costs
5. Improve employee access to information
6. Improve student/customer retention
7. Improve collaboration among employees

IT Objectives

1. Deploy new applications
2. Improve the efficiency of IT resource utilization
3. Improve the performance / speed of networks / networked applications
4. Replace aging applications
5. Improve the use of IT assets
6. Provide a consolidated view of data

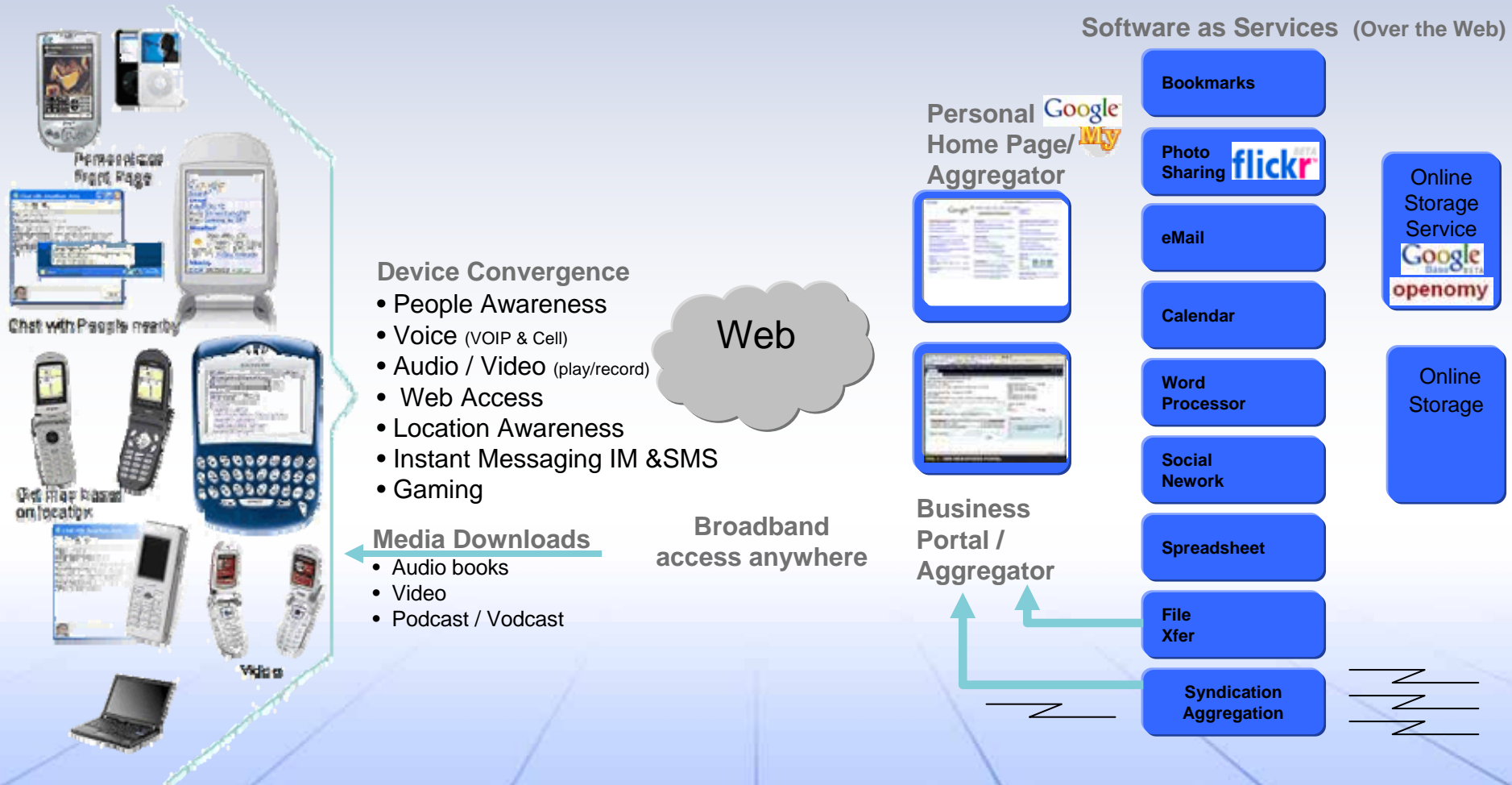
Source: U.S. Education Executive Insights, October 2006

Top priorities for educational institutions



Source: U.S. Education Executive Insights, October 2006

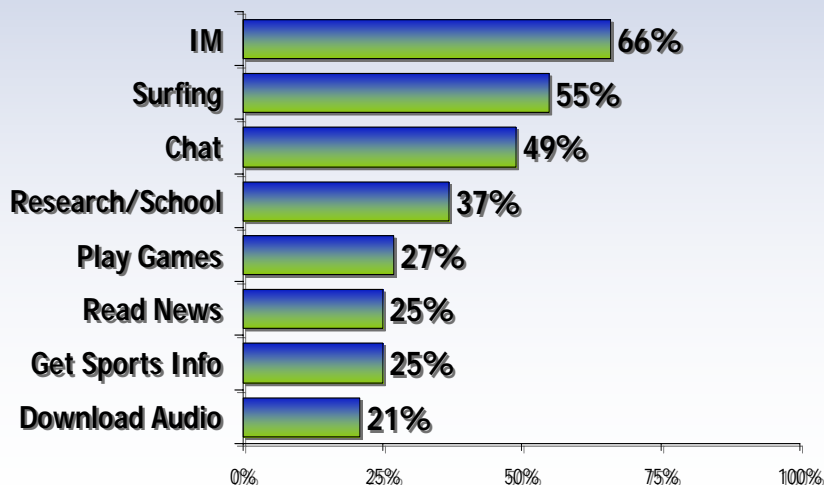
Technology continues its rapid growth, spawning both opportunity and challenge – and constant change



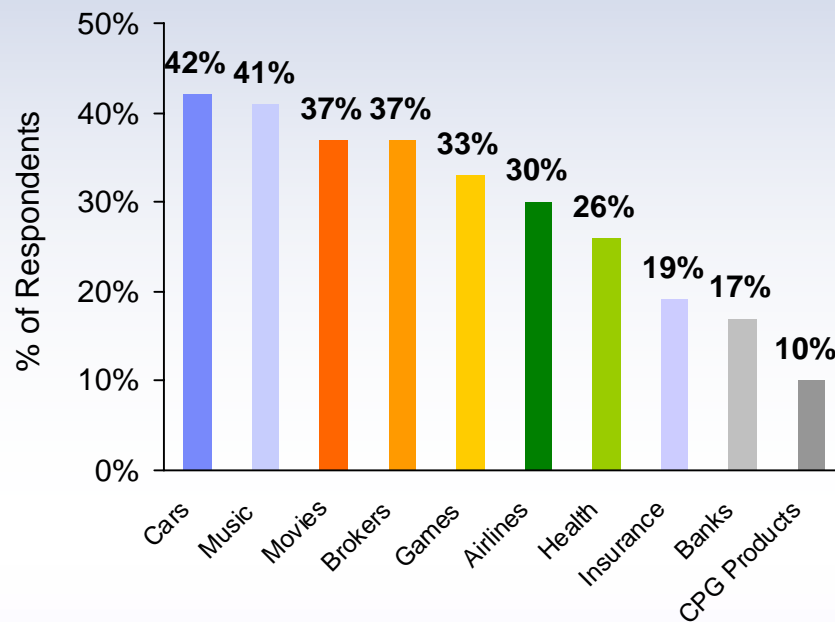
24x7 access to online information has enabled students to make more informed decisions that are aligned to what is uniquely important to them



US Teenager Online Activity
Harris/MTV Poll



U.S. Consumers Changing Opinion Due to Online Information, 2002



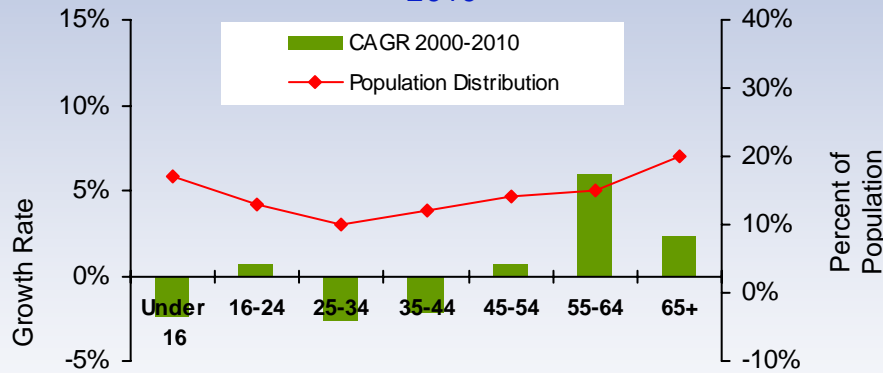
Product and Service Categories

“Students are not just using technology differently today, but are approaching their life and daily activities differently because of the technology – Net Day 2004 survey

” Forrester Research; American Interactive Consumer Survey, 2002, Dieringer Research Group

Population distribution and growth are shifting to opposite ends of consumer age groups, posing new challenges for traditional institutions

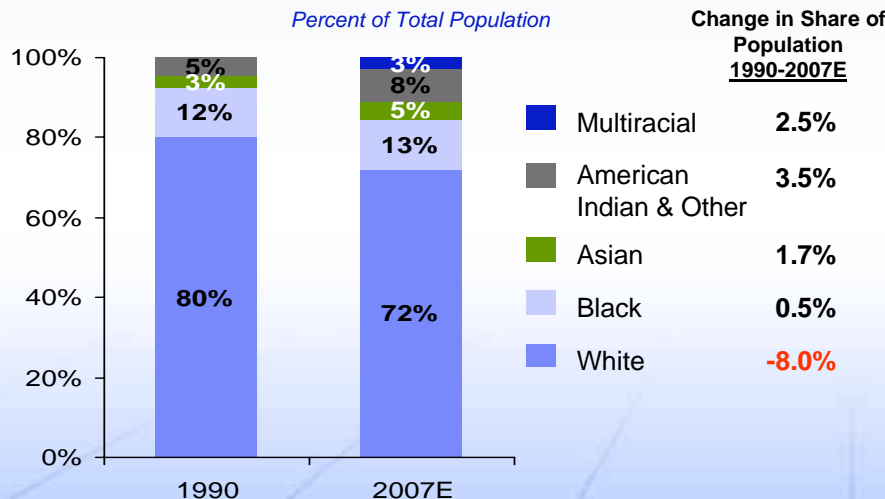
U.S. Population by Age 2010



- Youthful consumers are fickle and technology-savvy, with increased awareness and little brand loyalty



U.S. Population Distribution by Race 1990 vs. 2007E¹
Percent of Total Population



- Older consumers are more jaded, less likely to change brands, and demand quality and service

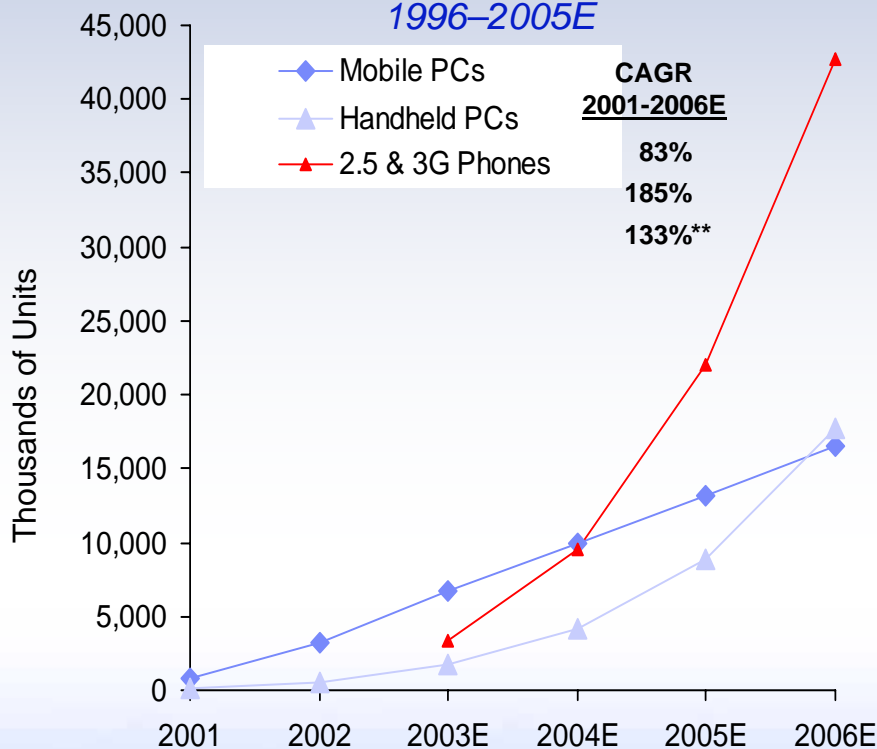


Baby boomers have successfully redefined the market as they age and the diverse "Echo Boomers" will have an even more significant secondary impact.

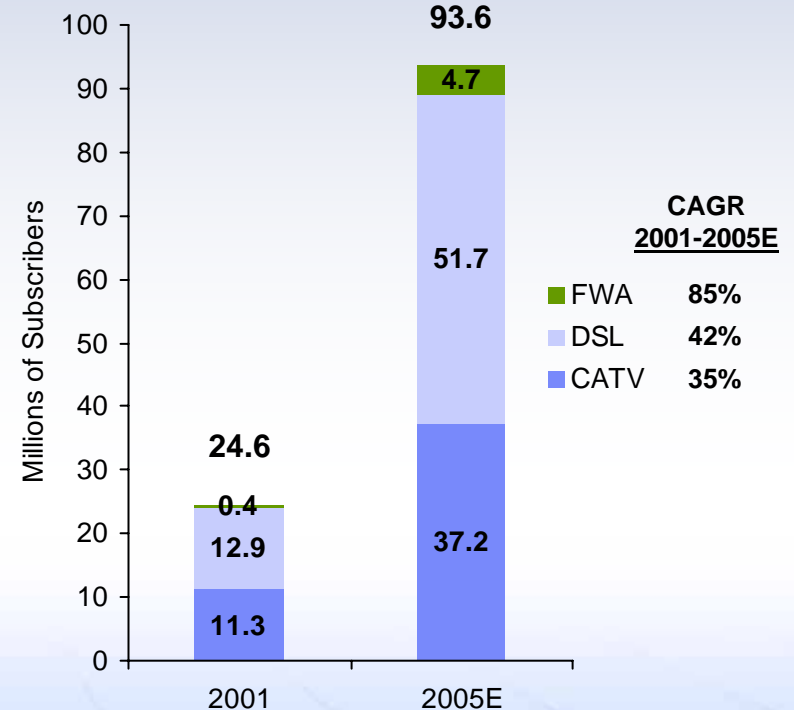
Source: US Statistical Abstract 2001; "Evolving Consumer Landscapes," Datamonitor, 2002; Economist Intelligence Unit.
1. Hispanics are not included in the chart as they may characterize themselves as white, black or multi-racial

Real-time access to information will be further enabled by rapid and widespread adoption of next-generation wireless devices and wireless community broadband networking

Global Growth in Mobile Devices with Embedded WLAN
1996–2005E

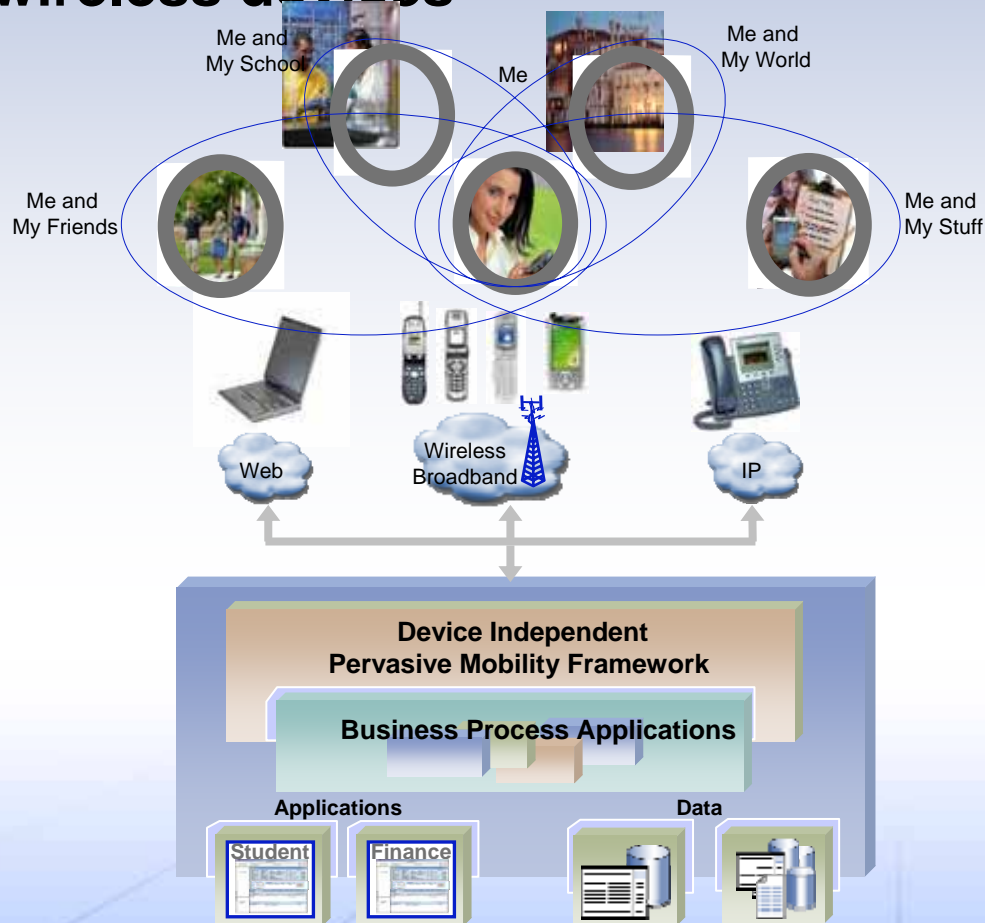


Global Broadband Subscribers
2001–2005E



Source: "Global Market Size for Mobile Communications Products with embedded WLAN," Reed Business Information, 15 April 2003; Morgan Stanley Dean Witter; IDC; The Yankee Group; CTIA; Jupiter 2001; Gartner

One of the biggest challenges for institutions will be to continually upgrade their *infrastructure* to support emerging learning and research applications and the proliferation of wireless devices



IBM's Pervasive Mobility Framework for Education

Key Issues

- **Cost:** How will institutions afford to continually upgrade their infrastructure to support the exploding number and types of applications and devices on campus
- **Support:** What devices will the institution support for access to learning and student services? How quickly can the institution respond to rapid shifts in the market?
- **Security:** With the geometric expansion of security threats exacerbated by explosion of connected devices, how will the institution secure its infrastructure against attack and interruptions in service
- **Intellectual Property Protection:** As institutions develop their own learner-centric business models and join the Learning Economy, how will they protect their own and licensed intellectual property across this wide range of mobile devices capable of storage, playback and duplication?

Why choose IBM as a Partner for e-Learning?

Deep and extensive experience in K-80 Education

- ✓ Consulting and service experience in K12, Higher Ed and Workforce Development
- ✓ Top IT trainer in the world and leading corporate training provider

Leader in open technologies and open learning platforms

- ✓ Early Sakai commercial affiliate
- ✓ Broad set of products and partners to support an open infrastructure

High quality global delivery infrastructure

- ✓ Our hosted service combines Sakai, HarvestRoad and other tools to support virtual learning and collaboration
- ✓ Proven tools and methodologies to support the creation of quality digital content as the leading developer of corporate training materials
- ✓ Global hosting facilities and experience

A partnership for targeting education opportunities

- ✓ IBM is the leading provider of consulting and services for education and government training
- ✓ IBM does not offer credit or degree based programs directly, but could both offer courses from you to our clients, and augment your offerings with our services and capabilities as needed
- ✓ Our hosted model can link providers of specific courses and course content across institutions:
 - ✓ Higher ed courses to K-12 and adult learners
 - ✓ Link to publisher content

The requirements of the 21st century's global economy translate into specific challenges for U.S. educators.



- State and local educational systems
 - Meeting federal reporting mandates
 - Improving state educational performance to meet economic goals
 - Driving change in learning outcomes
 - Seeking financial efficiencies

- Research, state and private universities
 - Maintaining innovation and market differentiation
 - Maintain and enhance services to attract faculty and students
 - Increasing revenue sources, improving financial efficiencies

- Community colleges
 - Providing core vocational skills – ½ of college students are in CCs
 - Addressing the needs of business for skilled workers
 - Meeting the needs of local communities with limited budgets

- K-12 districts