



國立臺灣師範大學

NATIONAL TAIWAN NORMAL UNIVERSITY

# The Use of Technology in Human Capital Development

Presented by

C. Rosa Yeh

Assistant Professor

Graduate Institute of International  
Human Resource Development

National Taiwan Normal University

October 16, 2009



<http://www.ntnu.edu.tw>

# Outline

- **Human capital and learning**
- **Why technology**
- **Development of ICT in learning**
- **Current applications**
- **Corporate examples**
- **Barriers to adoption**
- **Recommendations**



# Human Capital Defined

- **Health, skills and knowledge, which have economic value (Schultz, 1961)**
- **The knowledge, skills, and abilities of employees in a firm's workforce (Becker, 1964)**



# Purpose of Human Capital Development

**To strengthen national/organizational/individual human capital through the promotion and facilitation of**

- School education,
- Government/corporate training , and
- Individual learning



# How do people learn?

- **Behaviorism**
  - Practice makes perfect
- **Cognitivism**
  - Learning as knowledge acquisition, focusing on information processing
- **Constructivism**
  - Knowledge comes from within
- **Connectivism**
  - Learning occurs when connecting people to people and people to sources of information

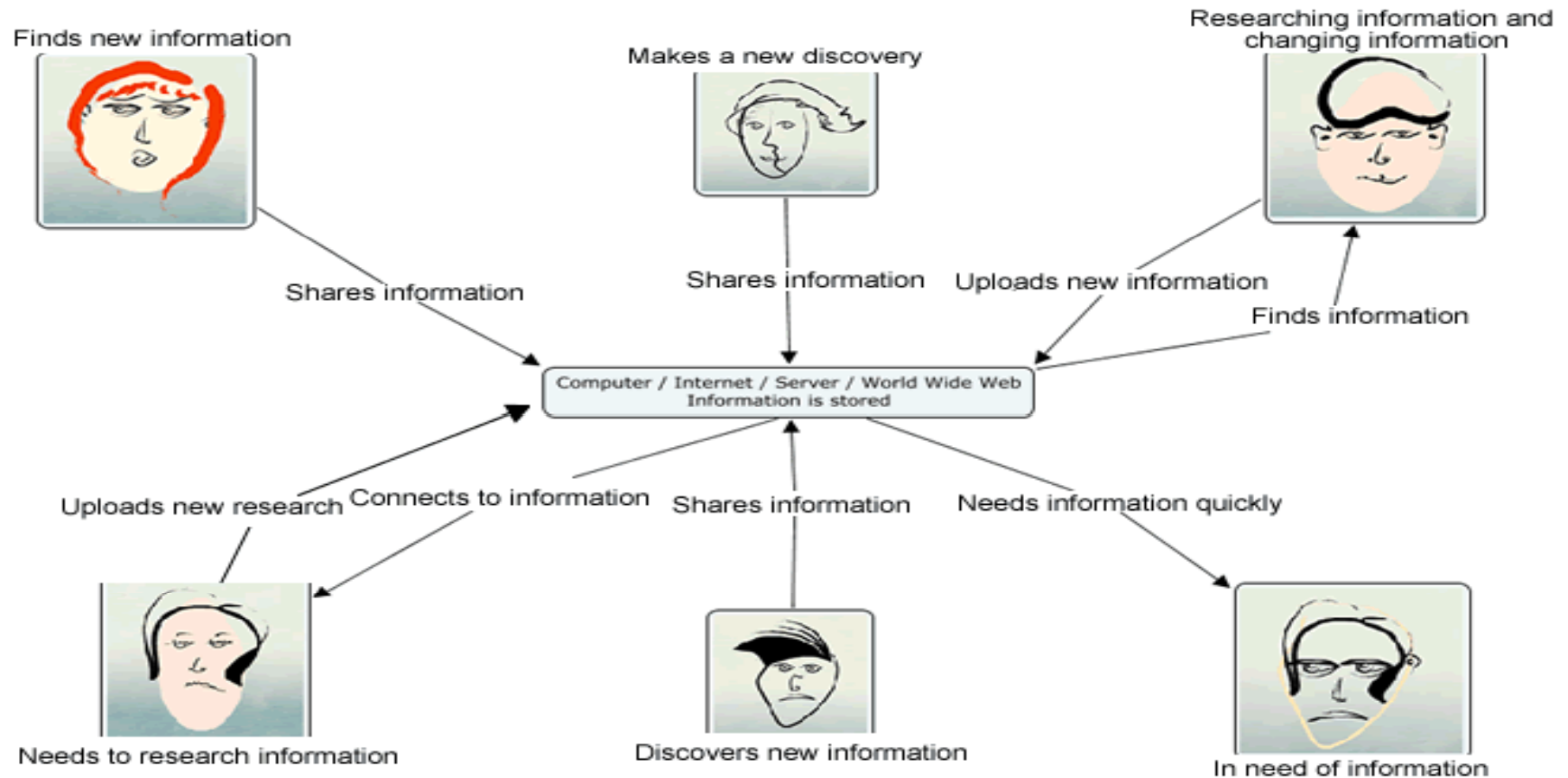


# Criticisms

- **Behaviorism – Achievement is important...but where's creativity, satisfaction, social values**
- **Cognitivism – Lack of reinforcement, active learning**
- **Constructivism – Contradictions within approach, e.g., autonomy. Slow, slow, slow**



# Connectivism is proposed as the learning theory in the digital age



# Technology? Why we should

Because....

Shift Happens!



# Technology? Why we should

- An OECD 7-country survey of adult literacy found that in each of the 7 countries, people who used computers consistently scored higher on average on the prose literacy scale than those who did not. [i]
- According to a 2007 American Society of Training and Development (ASTD) State of the Industry report: The use of technology-based training increased to 30.28 percent in 2006, up from 11.47 percent in 2001.

[i] OECD and Statistics Canada, "Learning a Living: First Results of the Adult Literacy and Life Skills Survey." Ottawa and Paris (2005), p. 200. Found at [www.oecd.org/dataoecd/44/7/34867438.pdf#search=%22OECD%20%22Learning%20a%20Living%22%22](http://www.oecd.org/dataoecd/44/7/34867438.pdf#search=%22OECD%20%22Learning%20a%20Living%22%22)

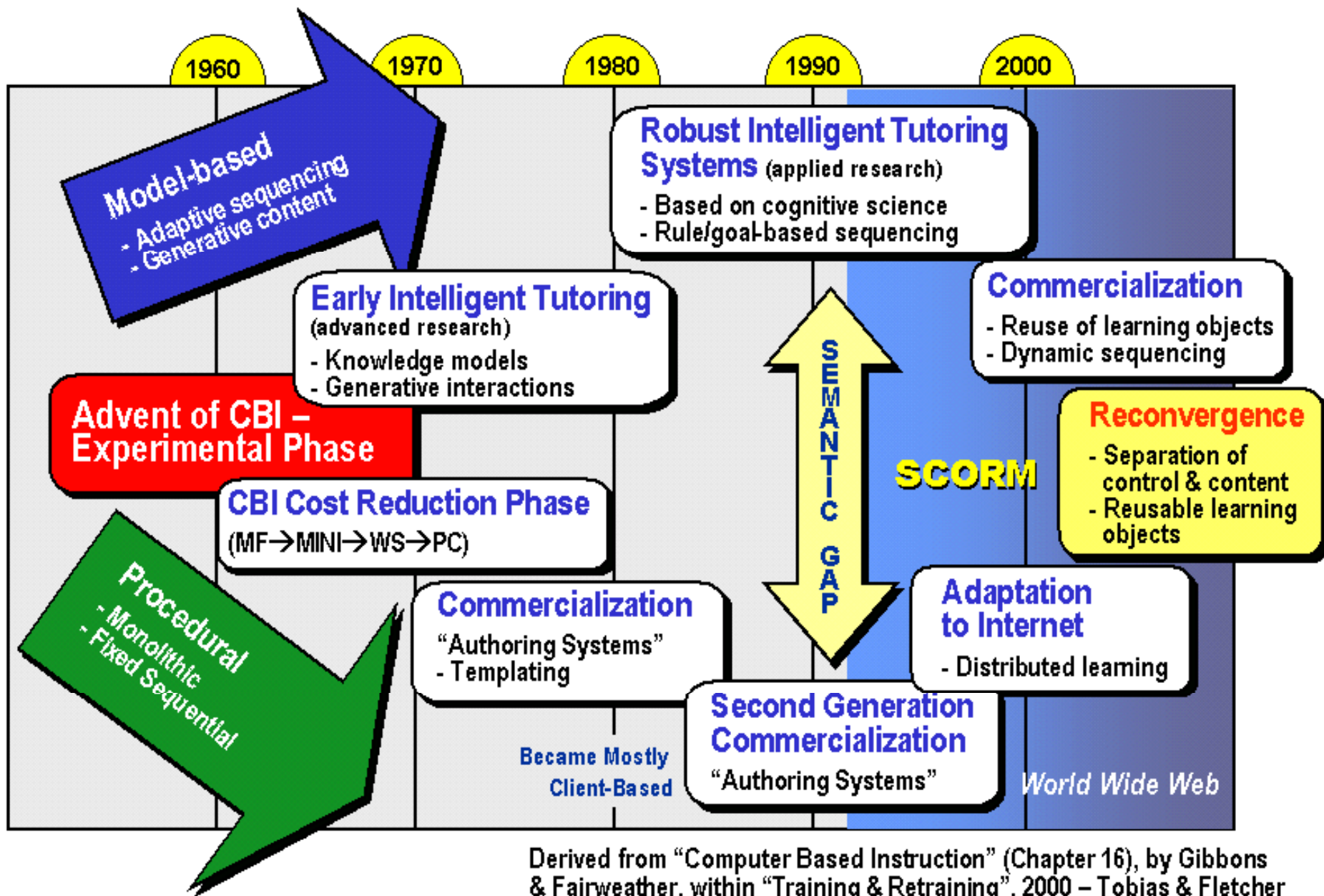


# Technology? Why we should

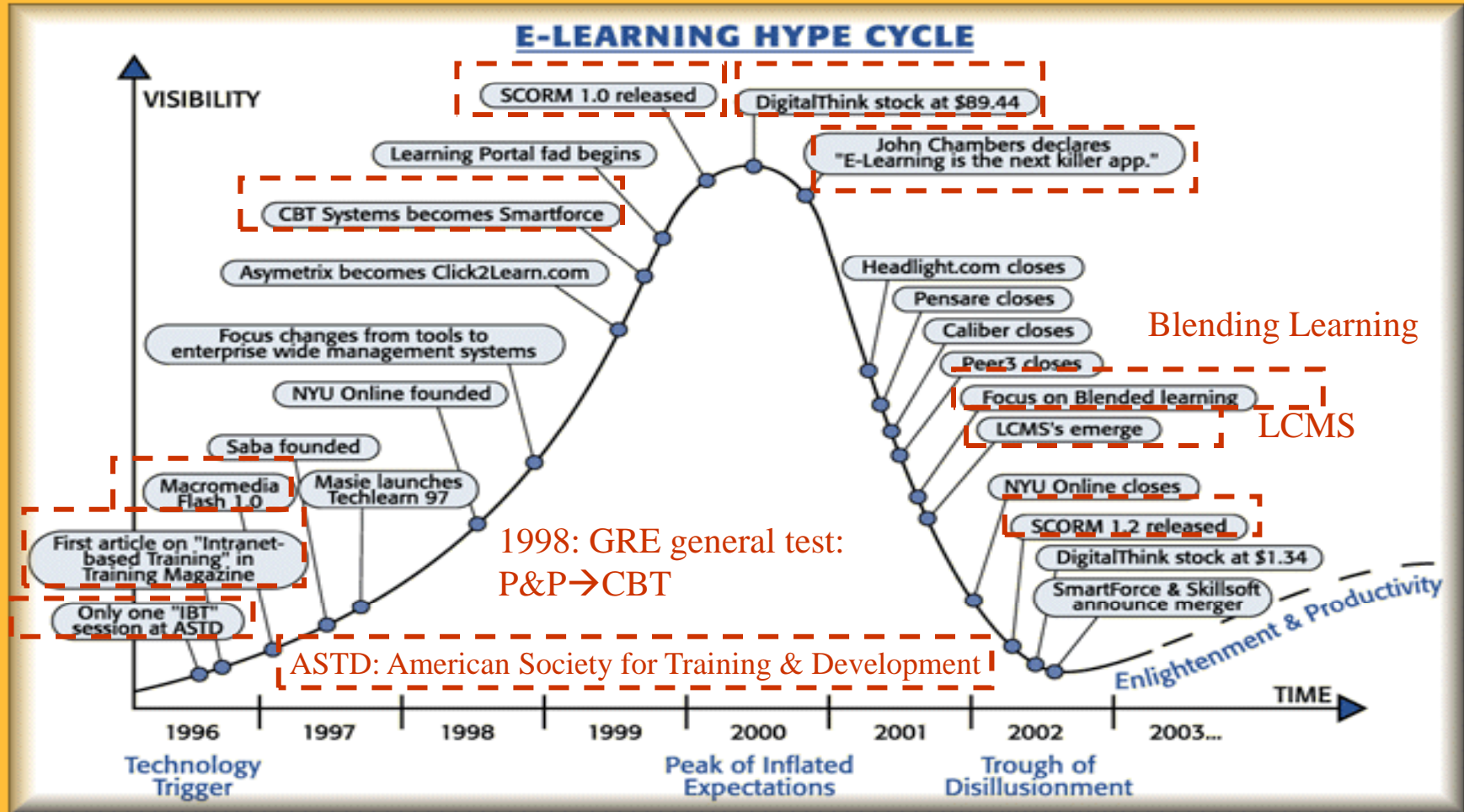
- Evaluations of pilots, programs and use of tools + R&D demonstrate value for tech-enabled learning.
- Tech-enabled learning enables not only skill acquisition but also ability to navigate the “information workplace” and the information world
- A 2005 survey found that 87 percent of 12-to-17-year-olds play games online, while only 54 percent of 18-to-28-year-olds – those already at work – do so. As the 12-17 year olds begin to make up growing percentages of the workforce, it will be incumbent on employers to adapt. [ii]

[ii]. Pew Internet & American Life Project, December 2005 (data from 2004 to 2005), found at [www.pewinternet.org](http://www.pewinternet.org).





# E-Learning Hype Cycle



# ASTD: Best Technology Performance Initiatives

**Technology is being used in organizations to:**

- Create communities of practice and facilitate collaboration.
- Develop knowledge management systems.
- Develop online documentation systems.
- Provide easy access to standards and manuals.
- Reduce training costs.



# Technology-based Learning (TBL)

Constitutes learning via electronic technology, including the Internet, intranets, satellite broadcasts, audio and video conferencing, bulletin boards, chat rooms, webcasts, video, TV, CD-ROM, webspace, cellphone, pda, email, iPod, etc.

**aka: e-learning, web-based learning,  
distance education, etc.**



# Synchronous vs. Asynchronous

## Synchronous:

- Occurs at the same time
- allows for immediate communication
  - Interactive video (video conferencing)
  - VOIP
  - online chat session
  - virtual classroom or meeting

## Asynchronous:

- Occurs at different times
- allows for time to think, reflect, and gain additional information before responding
  - podcasts
  - discussion boards
  - e-mails
  - blogs, wikis



# Synchronous ICT

## Interactive Video:

Live two-way audio and video. Runs on the Internet. Point-to-point or multi-point (Polycom). Requires camera, microphone and high-speed Internet. Allows for up to 30 simultaneous connections.

<http://www.polycom.com/usa/en/home/index.html>

## Voice Over IP (VOIP):

Internet telephone. Requires installation (free) and headset. A camera is optional. Allows for up to 10 simultaneous video; unlimited audio only.

Skype is an example: <http://www.skype.com>

16



# Asynchronous ICT

## Podcasts:

- One-way communication to disperse information, recorded audio and/or video.
- Information is stored on a streaming server (I-tunes) and is downloadable for later use.
- Requires a handheld or computer, speakers or headphones.
- Anyone with the link can view.
- Examples are viewable at <http://podcast.com>.



# Asynchronous ICT

## Blogs:

- Two-way communication which allows for sharing of text, digital images or video.
- Requires a computer and speakers if audio is used.
- Can be closed or open to public.
- Examples viewable at <http://blogger.com>.



# Asynchronous ICT

## Wikis:

- Wikis can be used as knowledge management tools.
- They can store definitions, documents, training videos, company policies, and more.
  - Google Docs: <http://docs.google.com>
  - Wikipedia: [http://en.wikipedia.org/wiki/main\\_page](http://en.wikipedia.org/wiki/main_page)
  - Pmwiki (download and host): <http://www.pmwiki.org>
  - Web-based wiki services:
    - Pbwiki: <http://www.pbwiki.com>
  - Social text: <http://www.socialtext.com>;  
<http://www.atlassian.com>



# Both

## Webinars:

- Provide one-way video and two-way audio.
- These are typically viewed live but can be saved and streamed for one-way delivery of information.
- Examples related to classroom technology are viewable at <http://www.campustechnology.com/mcv/resources/webinars/>

## Learning Management Systems:

- Typically provide many services; asynchronous includes discussion (similar to a blog), email.
- Content areas include text, audio, video, etc.
  - Blackboard: <http://www.blackboard.com>.
  - Open Source: <http://opensource.org>.



# Other Technology

## Capture tools:

- Capture live instruction for later distribution, either streaming or in a package.
  - Adobe's Captivate: <http://www.adobe.com/products>
  - Camtasia: <http://www.techsmith.com/camtasia.asp>

## Aggregators:

- These are management tools with which the user sets parameters and the aggregator will pull together information from multiple sources to one location for reading.

<http://www.newsonfeeds.com/faq/aggregators>



# Other Technology

## Social bookmarking:

- Users save links to web pages that they want to remember and/or share.
- These bookmarks can be saved privately, shared with specified people or groups, shared inside intranets, or another combination of public and private domain.
- Examples: <http://docs.google.com>, <http://www.popfly.com>.

## Online social networking program:

- Facebook: a social utility that connects people with friends and others online. <http://www.facebook.com/>
- Second Life: A virtual world where individuals create their own avatar and can then travel around in the world communicating with others who are present. <http://secondlife.com>,



# What is the corporate world doing?

2004 US survey of 239 training professionals

	Response Options	Response Rate %
1	Authentic cases and scenario learning	63.04
2	Simulations or gaming	50.00
3	Virtual team collaboration and problem solving	46.52
4	Problem-based learning	42.17
5	Coaching or mentoring	39.13
6	Guided learning	37.39
7	Self-paced learning	34.35

**Table 1: Instructional strategies to be more widely used in the coming decade**

Kim, K. J., Bonk, C. J., & Zeng, T. (2005, June). Surveying the future of workplace e-learning: The rise of blending, interactivity, and authentic learning. *E-Learn Magazine*.



# What is the corporate world doing?

## Mobile Learning

- Hispanic-speaking food service workers in Sodexo, **McDonald's**, and other restaurants are learning English via a portable electronic device that enables them, by pointing at a picture on the screen, to record and hear English pronunciation as many times as they need to help them master their speaking skills.
- **Marriott International** is developing bite-sized training podcasts so a worker can download information to cell phone, laptop and iPod as needed.



# What is the corporate world doing?

## Learning by Doing: Simulations

- **Carnegie Mellon** has developed a prototype simulation/game, “Biohazard”
- **Verizon** is one of many corporations that have begun to use simulations for “practice” , simultaneously taking advantage of the knowledge of long-time employees, by developing a course on installing DSL.
- **Home Depot** has introduced kiosks in all stores so its 300,000 employees can bone up on forklift safety and product details with electronic tutorials. They can click through simulations to learn which aisles to close when restocking and to improve knowledge of plumbing (for example) when they switch departments.



# What is the corporate world doing?

## Games and Virtual Worlds

- **The US Army games**
  - training soldiers to deal with situations they may face in combat or other types of deployment or developing knowledge of strategy in war games.
  - as recruitment tool, giving players an opportunity to learn how to jointly accomplish military tasks while using different skills – and to interest the individual in joining the Army.
- **IBM new video game technology and the virtual world of the Internet as a global on-boarding tool**
  - making it easier and faster to train a huge influx of new employees.
  - taking advantage of the Internet's 3-D virtual world that runs on platforms such as Second Life
  - Uses social network capabilities of the Internet to break down the barriers of distance and satellite office environments.



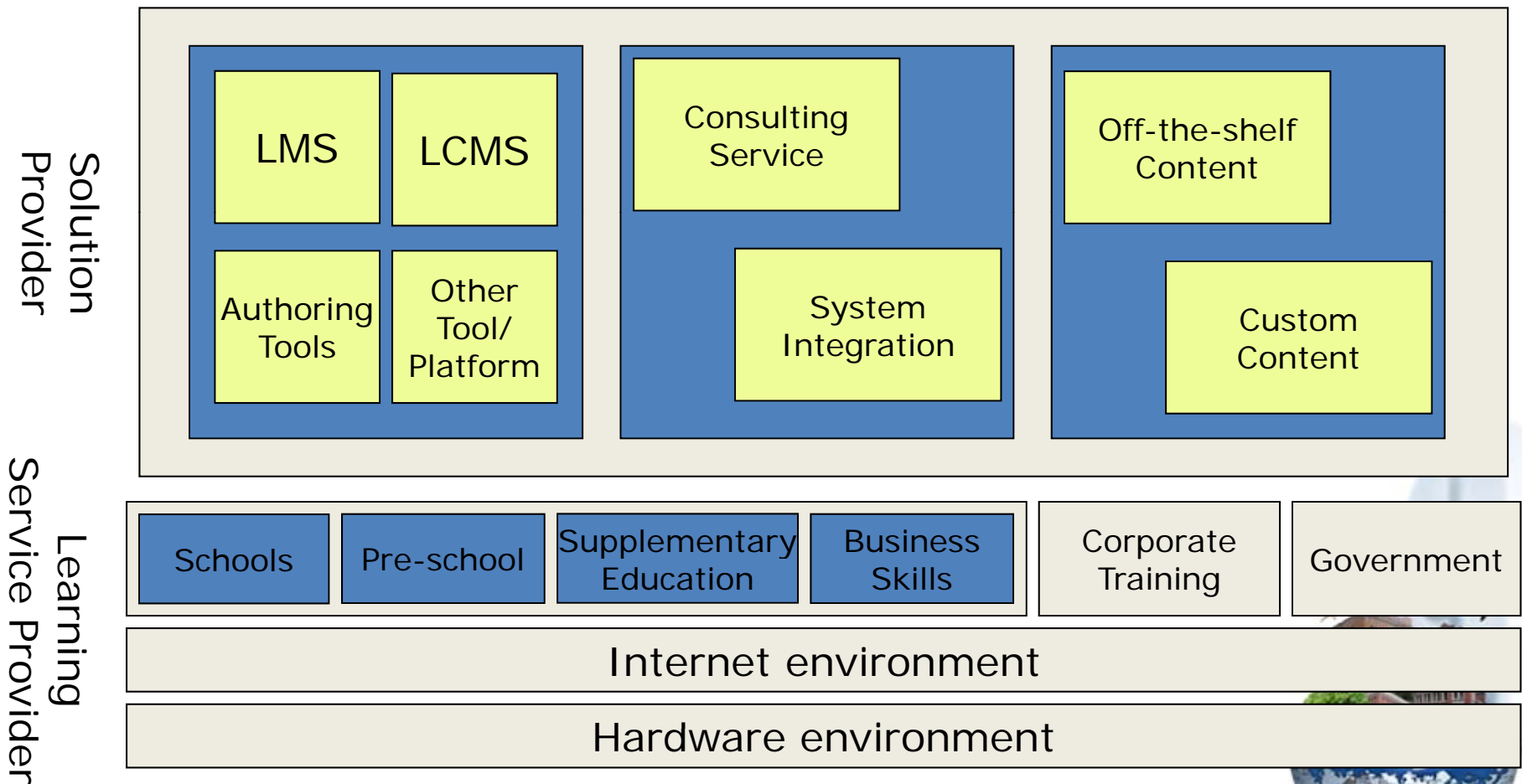
# Technology?

## Why we haven't

- **FEAR and CUSTOM**
  - Fear of technology in general
  - Fear of technology replacing human
  - Effectiveness of TBL in question
  - Social loafing
- **Technology and infrastructure problems**
- **Undercuts business models of institutions**
- **Governments are inherently conservative**
- **Passionate constituencies for status quo**
- **Funding inconsistency**
- **Aging leadership**



# Technology-based Learning Market Segments

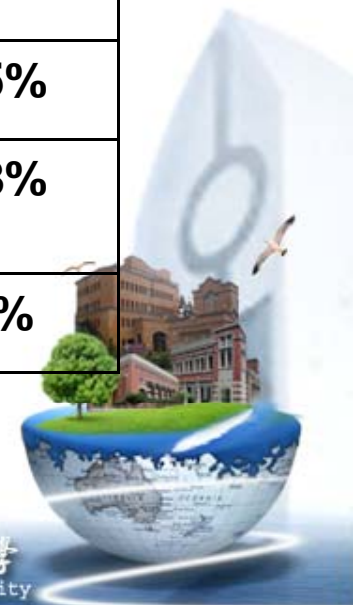


# 2006 US survey of 2251 college academic officers

Barriers to Widespread Adoption of Online Learning (Percent Agreeing)

<b>Students need more discipline to succeed in online courses</b>	<b>63.6%</b>
<b>Greater faculty time and effort required to teach online</b>	<b>31.9%</b>
<b>Lack of acceptance of online instruction by faculty</b>	<b>25.9%</b>
<b>Online education costs more to develop and deliver</b>	<b>23.5%</b>
<b>Lack of acceptance of online degrees by potential employers</b>	<b>13.8%</b>
<b>Lack of student demand for online courses and degrees</b>	<b>4.6%</b>

Allen, I. E., & Seaman, J. (2006). Making the grade: Online education in the United States. The Sloan Consortium (Sloan-C).



# Recommendations: Governments

- **Initiate National debate**
  - Engage powerful partners (corporations)
  - narrow participating community (reduce institutional representation)
  - expand participating community (bring in the techies)
- **Craft a comprehensive TBL agenda that represents traditional silos e-learning interests under one umbrella**
- **Install broadband**
- **Expand R&D on TBL**
- **Identify and promote existing ICT assessments/credentials, and fund development of credible, vendor-neutral assessments/credentials**



# Recommendations: Organizations

- **Look beyond traditional business for partners: approach ICT companies/creative start-ups with younger generation**
- **Identify what we know are/will be “21st century jobs” and necessary skills**
- **Creativity in content, device, access, instructor/mentors**
- **Learn what is out there and PROMOTE it**
- **Add “digital” to the literacy requirements and assumptions**



# Just a very small sample of e-learning!

The class that waits for you!

<http://video.google.com/videoplay?docid=5200252042090497505&hl=en>

How to change a tire

<http://www.youtube.com/watch?gl=US&v=gx5bVnYq4jw>

E-learning curriculum development

[http://www.youtube.com/watch?v=sTyQ\\_X8nYuY](http://www.youtube.com/watch?v=sTyQ_X8nYuY)  
[http://www.youtube.com/watch?v=5nRMqC\\_Y1Ys](http://www.youtube.com/watch?v=5nRMqC_Y1Ys)

Excel list instruction

<http://www.youtube.com/watch?v=MsTTCZksXq4>

Live English e-learning from [www.tutorabc.com](http://www.tutorabc.com)

<http://www.youtube.com/watch?v=cC8Uw4OfIBc>

Interactive factory adventure

<http://www.youtube.com/watch?v=4PnpcYZ98I4>

