



Technologies for Learning

US Department of State,
April 30, 2008



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Global Lead, Education

Agenda

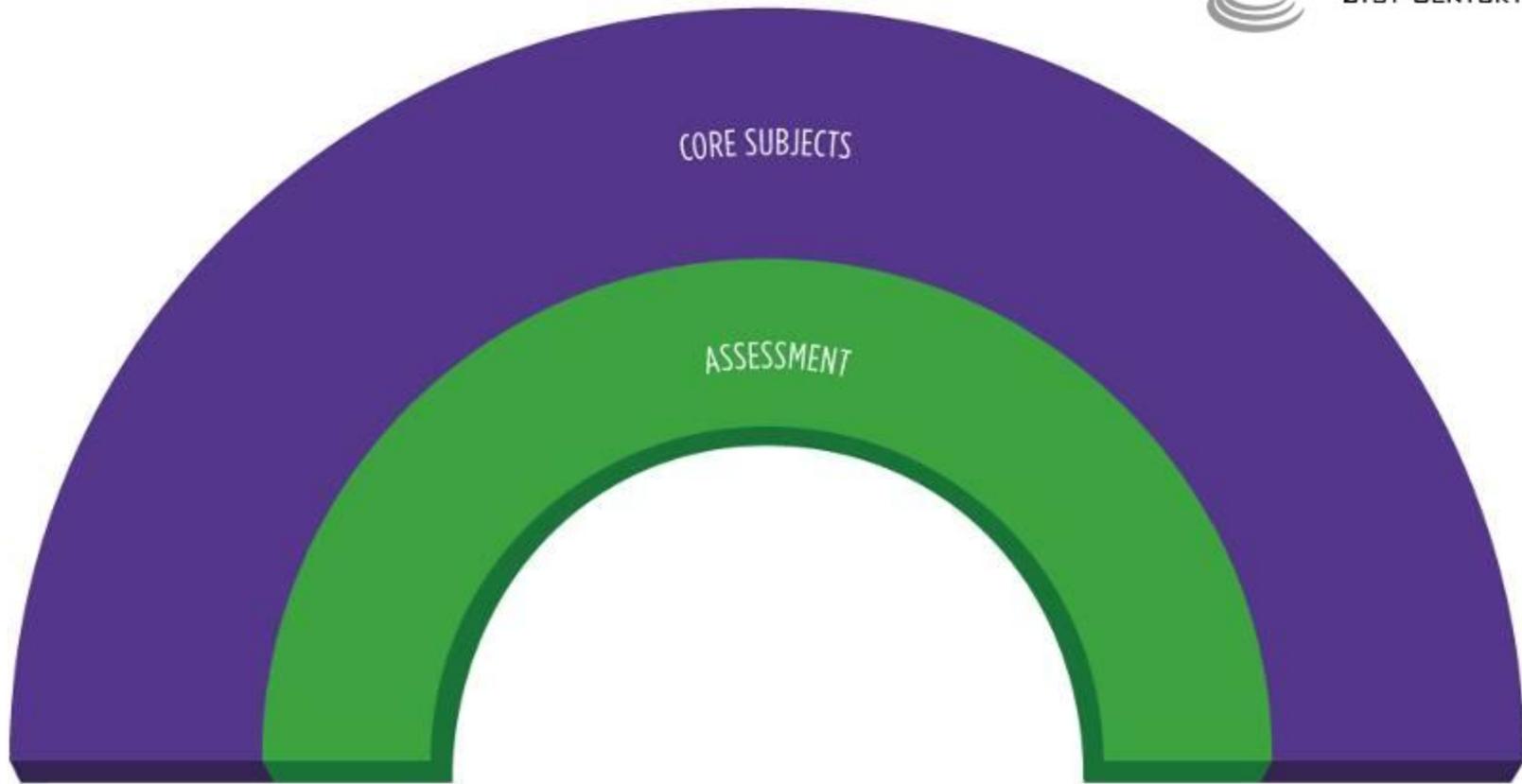
- What and How will we be teaching?
- How can Technology help?



20th Century Learning Model



PARTNERSHIP FOR
21ST CENTURY SKILLS



21st Century Learning Model



PARTNERSHIP FOR
21ST CENTURY SKILLS



Move to Learner-Centric Teaching and Learning

Lecturer-Centric



- Retention-Based
- Auditory/text

Learner-Centric

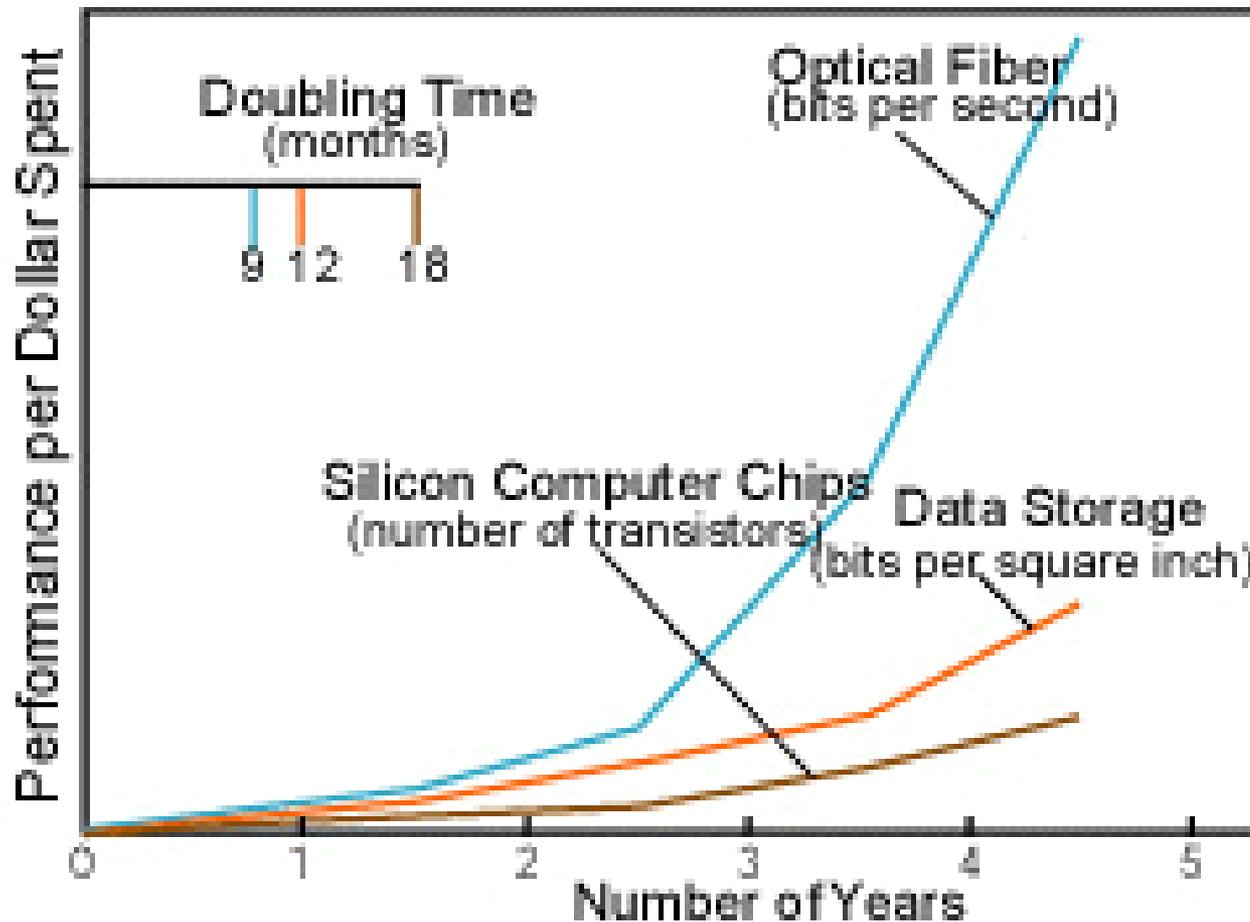


- Activity-based
- Multimodal (collaboration, visual, kinesthetic, auditory/text)



How can Technology help?

Technology *Acceleration*



Examples:

Human
Genome
mapping
(2005)

Video record
your entire
life (2025)

Brain-in-
computer
(2030)

Consequence - Device Proliferation: New Technology Every 1-3 Years



PC Labs



Laptop w/projector



TV



Videoconferencing



**Laptop/
Student**



Cell Phone



**Laptop/
Student**



**Personal Gaming
Device**



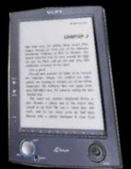
Tablet



**Personal
Media
Player**



PDA



e-Book

Consequence – Application Proliferation



Multiple Threads of Learning



**Community
Communication**



**Integrated
Learning Teams**



**Education
Partner
Collaboration**

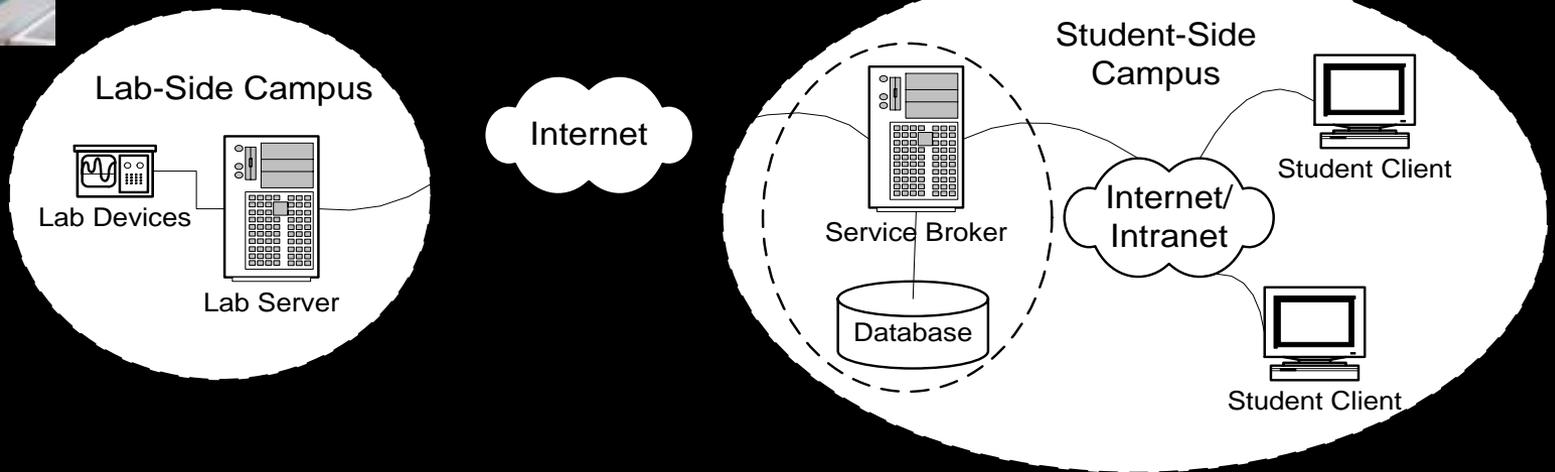
Multimodal Learning



**Administrator
Management**



iLabs



Source: MIT iLabs

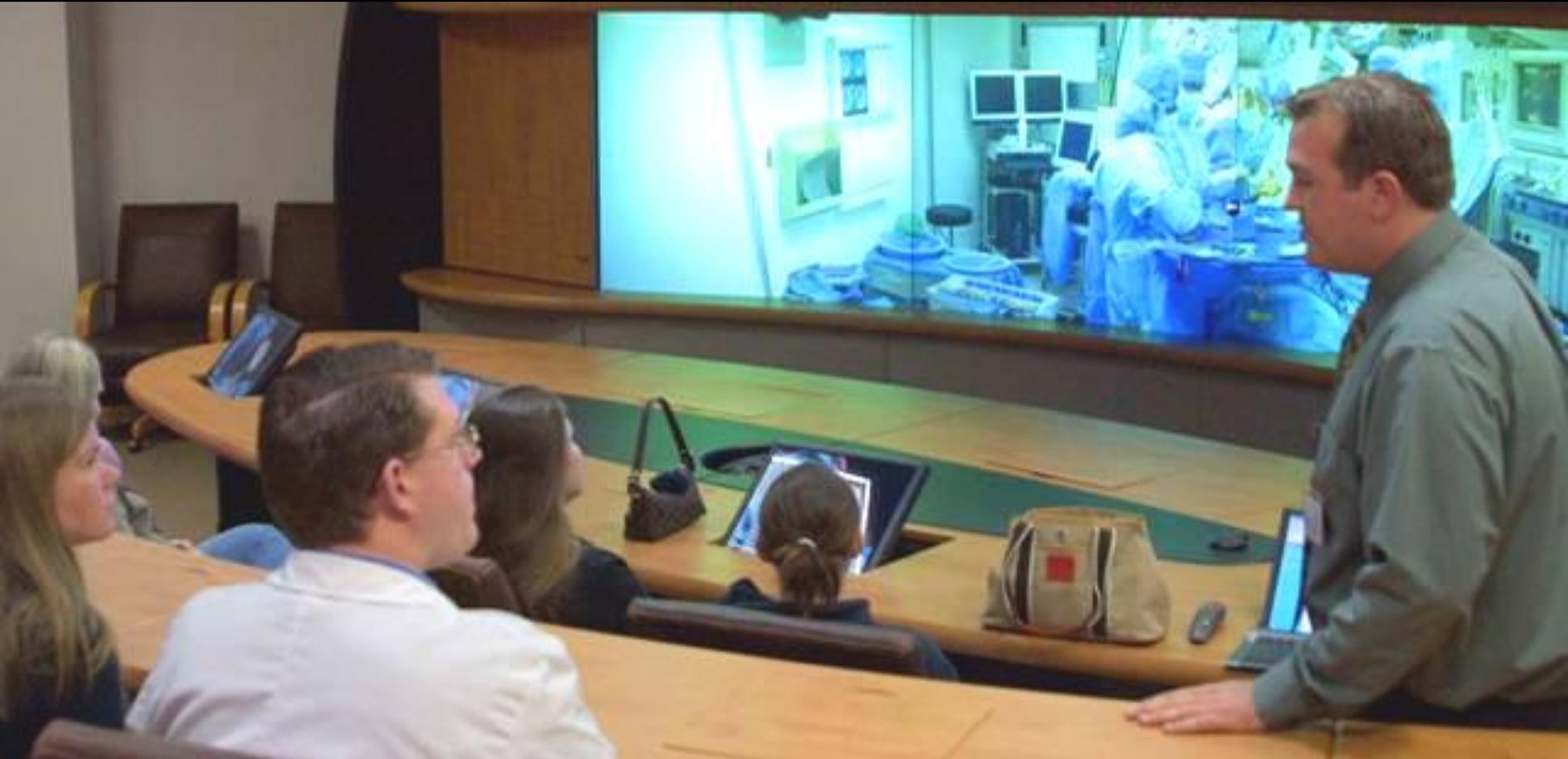
Immersive Environments – Avatars in Virtual Halls



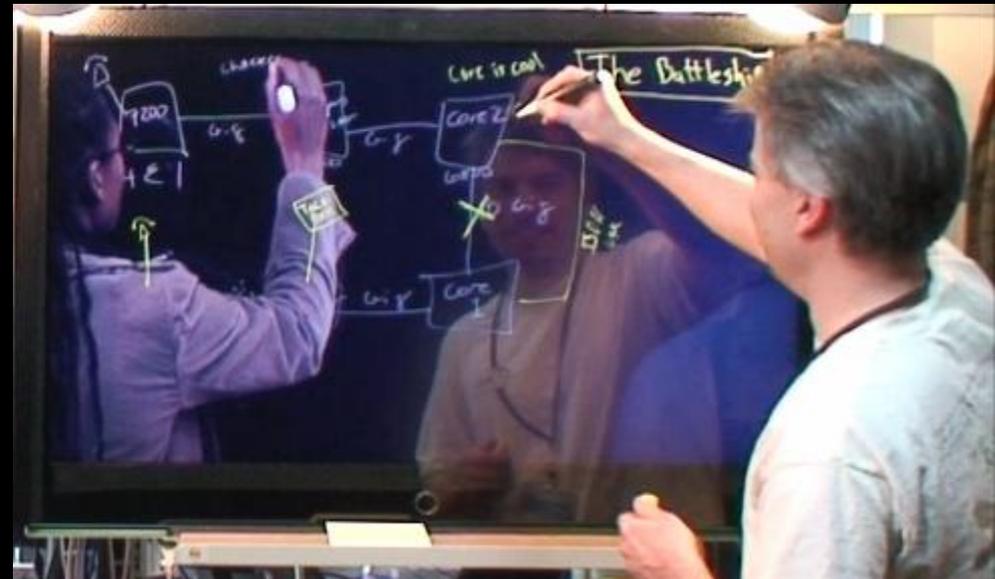
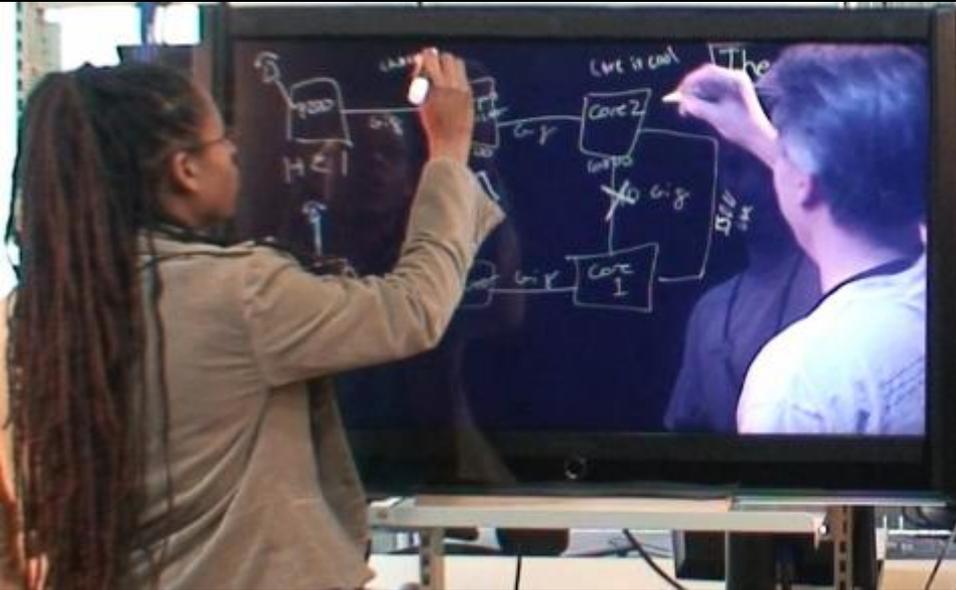
New Technologies

- **Telepresence**
- **Immersive Constructivist Environments**
- **Automated Real-Time Assessments**
- **Personal Learning Environments**
- **Automated Tutoring**

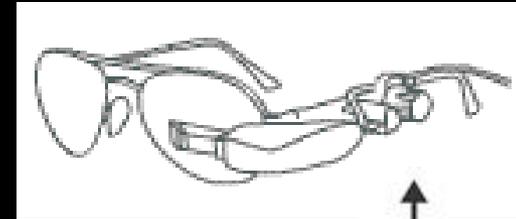
Telepresence



Telepresence with Whiteboarding



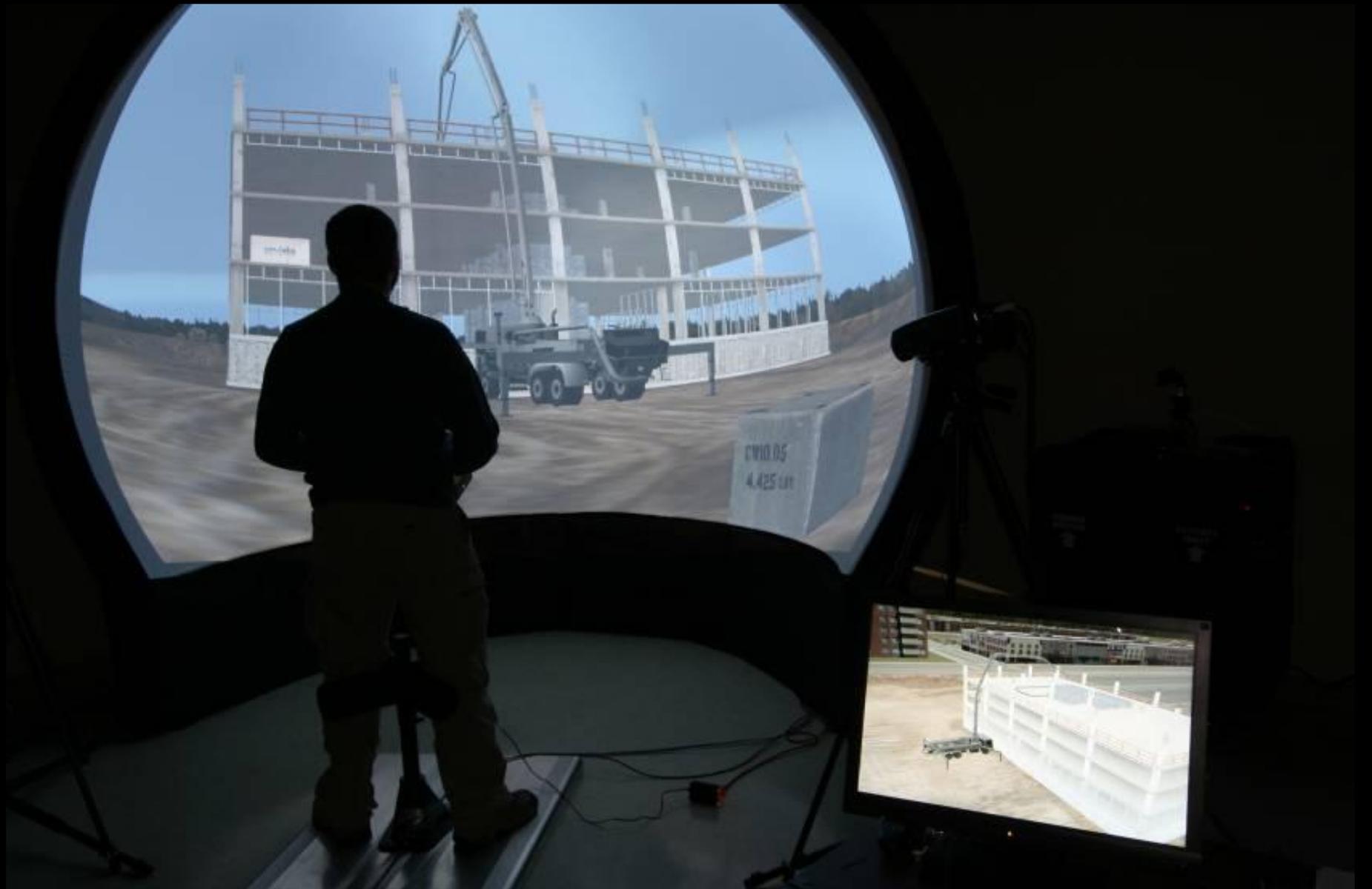
Immersive Environments – Augmented Reality



Immersive Environments – Virtual Reality



Immersive Displays



Automated Real-Time Formative Assessments

Class Report | Grade One mCLASS[®] Math

Class Report Change Class

Screening Progress Monitoring Diagnostic Interviews

Beginning of Year | School Year 2006-2007 | Grade 1 Change Benchmark: Beginning of Year

STUDENT	NUM ID		QUANTITY		MISSING #		NEXT #		# FACTS		COUNTING	
	SCORE	%	SCORE	%	SCORE	%	SCORE	%	SCORE	%	SCORE	%
Riza, Jasper	34	95	47	95	35	100	22	95	14	98	47	95
Delaney, Alexis	34	95	47	95	34	95	22	95	11	95	47	95
Edwards, Austin	21	60	32	80	32	90	20	90	6	65	32	60
Love, Alanah	17	55	21	55	30	95	20	85	6	65	21	55
Miller, Kayla	17	55	20	50	29	80	18	80	5	55	20	55
Neptune, Sage	16	45	18	45	19	45	17	75	10	85	18	45
Francis, Susan	15	35	16	40	17	35	16	70	10	85	16	35
Pawan, Oliver	15	35	13	35	17	35	15	65	8	80	13	35
Brown, Jacob	13	25	8	25	14	25	9	50	4	45	8	25
Brady, Joseph	33	90	32	80	28	70	7	40	3	40	32	90
Cote, Barret	30	85	28	70	28	70	6	35	2	30	28	85
Peel, Tyfler	23	70	40	90	25	65	4	30	2	30	40	70
Riley, Meqan	23	70	33	85	11	20	3	25	1	15	33	70
Sockalexis, Willow	11	20	5	20	11	20	2	20	1	15	5	20

Measure Key

Number ID (14 Students)
1 9 4

Quantity (14 Students)
1 7 6

Missing Number (14 Students)
2 7 5

Next Number (14 Students)
1 8 5

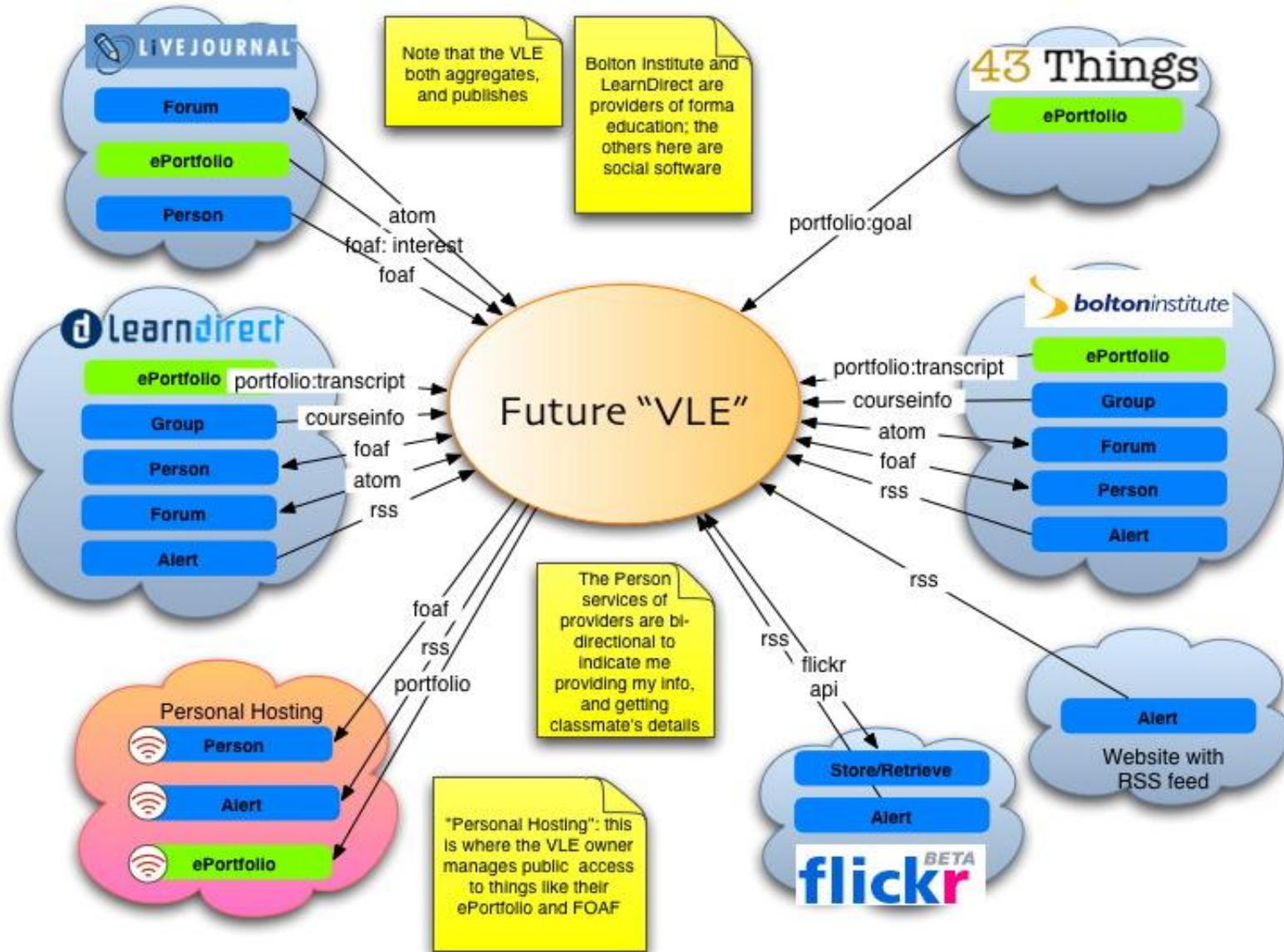
Number Facts (14 Students)
2 7 5

Counting (14 Students)
1 9 4



Courtesy: Wireless Generation, Inc.
Brooklyn, New York

Personal Learning Environments



Automated Tutoring

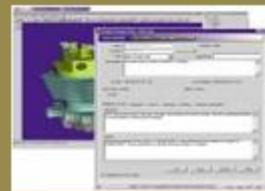
Tutor: “Jane, would you consider expansion at this time?”

Student Jane: “Not yet. Trying another way first. Watch me.”

Tutor: “.... As you noticed, it came at a cost - try a different route...”



Mashed-up, and Mobile too



Education Material Access



Interactive Education applications combined with collaboration



Expert location and fellow student lookup from multiple devices

TelePresence Room

Collaboration Room



Use presence and location services to locate resources and collaboration centers for studying and teaming sessions

Conclusion - The Challenges

Skill-based Education
via

Rapid and deep incorporation of Web 2.0/3.0 technologies for constructivist, multimodal and collaborative environments



***The Internet Is Changing the Way
We Work, Live, Play, and LearnSM***



Skills and Knowledge, according to employers

Basic Knowledge/Skills

English Language (spoken)
Reading Comprehension (in English)
Writing in English (grammar, spelling, etc.)
Mathematics
Science
Government/Economics
Humanities/Arts
Foreign Languages
History/Geography

Applied Skills

Critical Thinking/Problem Solving
Oral Communications
Written Communications
Teamwork/Collaboration
Diversity
Information Technology Application
Leadership
Creativity/Innovation
Lifelong Learning/Self Direction
Professionalism/Work Ethic
Ethics/Social Responsibility

Source: "Are they really ready to work?" report by the Conference Board, P21 et al

Evolution of Access to Information

Quantity
x Speed



Antiquity



Renaissance



Industrial
Revolution
→ Modern
Times



Internet Age



Time

How Technology Helps

- **Connects**: to a world of people and information
- **Motivates**: young learners are drawn to it
- **Personalizes**: mass personalization, per individualized learning styles (multimedia)
- **Strengthens**: scaffolds the learner in multiple learning dimensions; enhances creativity
- **Deepens**: allows deeper explorations and thus understanding; allows teaching for Skills not only Content; enhances creativity

Future Vision - Education Mashups

The screenshot displays a Windows XP desktop environment with a blue taskbar at the bottom. The desktop is a mashup of several applications:

- Map Application:** A central map showing the United States with several red location pins. Callout boxes are visible: "Mission Command LTC Smith" (top left), "Robert Frank Status: Preferred" (bottom center), and "CURATOR Status" (bottom right).
- Contact Lists:** Two contact windows are open. The top one is for "Boeing Eng: James Engle" and the bottom one is for "Andrea Kelly". Both show status (Available), phone number, and a list of contacts including Robert Frank, Mike Contreras, Kim Hansen, and Debbie Pattison.
- 3D Model:** A 3D CAD model of a mechanical part, possibly a turbine or engine component, is shown in the bottom left.
- File Explorer:** A window titled "Contents of \\server\Pro-DYKALDK" is open on the right, displaying a file list. The file list includes columns for File Name, Revision Number, Release Level, Workspace Status, and Author.
- Other Elements:** A "Boeing Eng: James Engle" window with a 3D model of a jet engine, a "LTC Smith" window with a photo of a person, and a "EDUCATION CENTRAL" window with a woman's portrait.

The taskbar at the bottom shows the Start button, several application icons, and the system tray with the time 7:18 AM.