Using Technology to Personalize Students' Learning of Global Competencies

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The Core Challenge We Face

- Shifts in the knowledge and skills society values
- Development of new methods of teaching and learning
- Changes in the characteristics of learners

Digital technologies
are reshaping each of these—
changing how we learn and know.

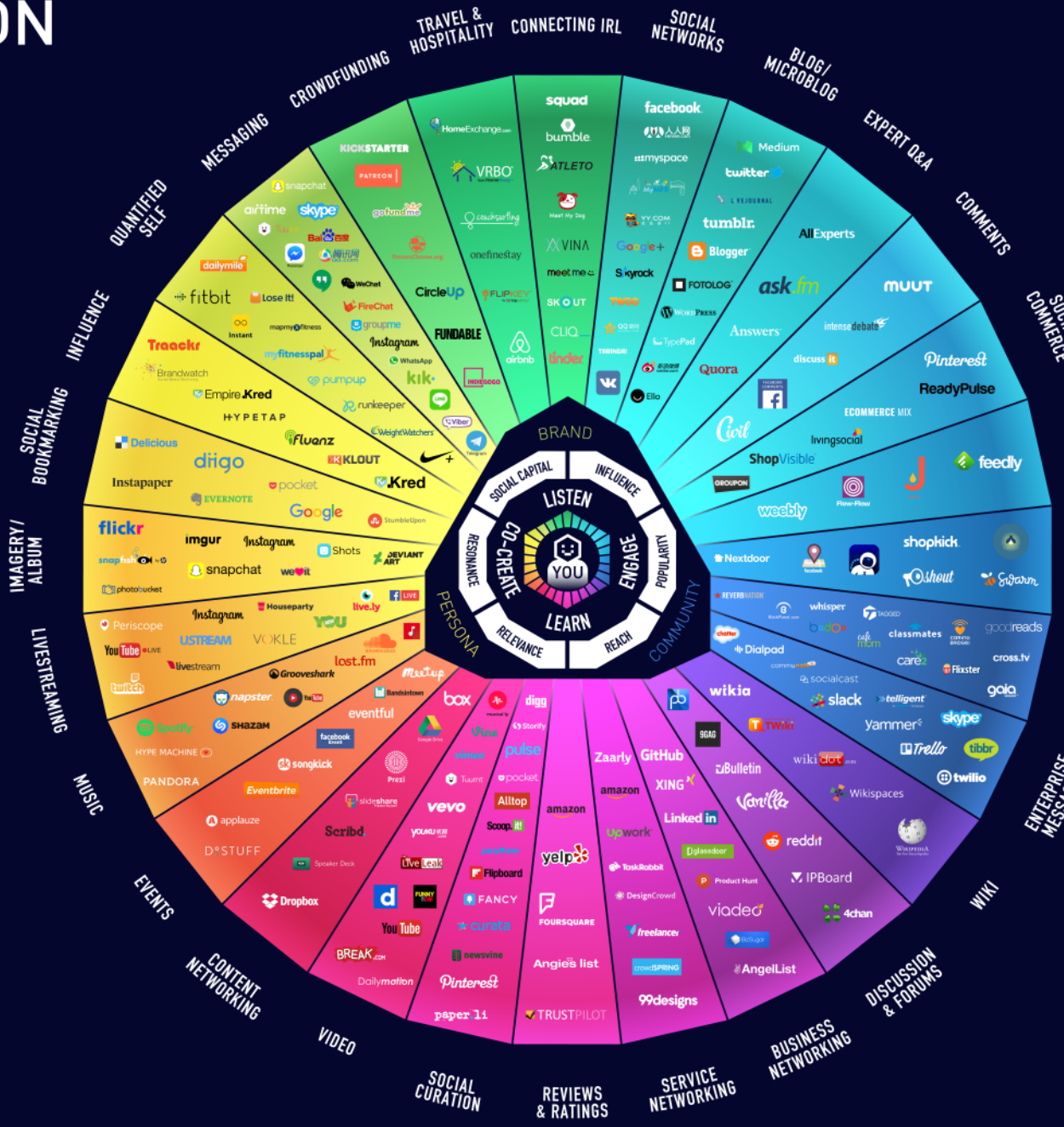
CONVERSATION PRISM 5.0

Brought to you by
Brian Solis & JESS3

Social Media Gave Everyone a Voice

The Conversation Prism debuted in 2008 as social media was exploding online. Social media would change everything about how we communicate, learn and share. It forever democratized information and reset the balance for influence.

The Conversation Prism was designed as a visual map of the conversational networks that continue to reshape everything. Its purpose is to help you understand and appreciate the statusphere so that you can play a productive and defining role in the conversations shaping our future.



For more information check out
conversationprism.com

Jenkins' Framework for New Literacies

- *Play* — experimenting with one's surroundings in problem-solving
- *Performance* — adopting alternative identities for improvisation and discovery
- *Simulation* —interpreting and constructing dynamic models of real-world processes
- *Appropriation* — the ability to meaningfully sample and remix media content
- *Multitasking* —scanning one's environment and shifting focus to salient details
- *Distributed Cognition* — fluently using tools that expand mental capacities
- *Collective Intelligence* —pooling knowledge with others toward a common goal
- *Judgment* —evaluating the reliability and credibility of different information sources
- *Transmedia Navigation* — the ability to follow the flow of stories and information across multiple modalities
- *Networking* — the ability to search for, synthesize, and disseminate information
- *Negotiation* — the ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms

Changing Metaphors

	Player Piano	Jazz Combo
Work	Factory	Learning Organization
Cognition	Warehouse	Process
Learning	Information Transfer	Thinking Skills
Student	Clerk	Symbolic Analyst
Unit	Individual	Team
Content	Curriculum	Project
Teacher	Lecturer	Facilitator
Assessment	Multiple Choice	Authentic/Portfolio

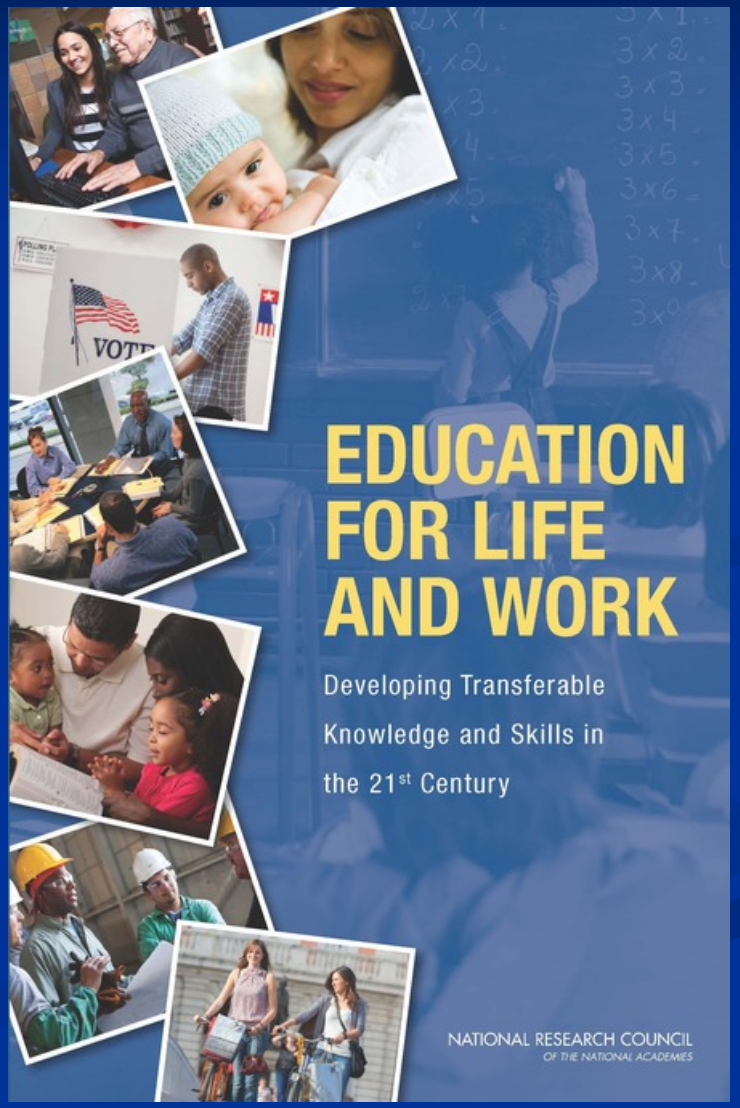
The Future of Skills: 2030

- Judgment and Decision Making
- Fluency of Ideas
- Active Learning
- Learning Strategies
- *Originality Abilities*
- Systems Evaluation
- Deductive Reasoning
- Complex Problem Solving

https://www.nesta.org.uk/publications/future-skills-employment-2030

National Research Council (2012)

Today's children can meet future challenges if their schooling and informal learning activities prepare them for adult roles as citizens, employees, managers, parents, volunteers, and entrepreneurs.




COGNITIVE
analysis
decision-making
critical thinking
adaptive learning
executive function
reasoning/argumentation
problem solving
active listening
interpretation
communication
innovation
information and communications technology (ict) literacy
creativity
INTERPERSONAL
social influence with others
responsibility
assertive communication
leadership
empathy/perspective-taking
trust
interpersonal competencies
self presentation
coordination
conflict resolution
service orientation
negotiation
collaboration
cooperation
teamwork
INTRAPERSONAL
adaptability
integrity
appreciation for diversity
intellectual interest and curiosity
self-monitoring
continuous learning
artistic and cultural appreciation
initiative
self-evaluation
productivity
professionalism/ethics
flexibility
metacognition
physical and psychological health
self direction
grit
citizenship
work ethic/conscientiousness
self-reinforcement
perseverance
responsibility
career orientation

Dimensions of Advanced Knowledge and Skills

Cognitive Outcomes	*Intrapersonal Outcomes*	*Interpersonal Outcomes*
Cognitive processes and strategies	**Intellectual Openness**	**Teamwork and Collaboration**
Knowledge	**Work Ethic and Conscientiousness**	**Leadership**
Creativity	**Positive Core Self-Evaluation**	**Communication**
Critical Thinking	**Metacognition**	**Responsibility**
Information Literacy	**Flexibility**	**Conflict Resolution**
Reasoning	**Initiative**	
Innovation	**Appreciation of Diversity**	

"Deeper Learning"

- Case-based learning
- Collaborative learning
- Apprenticeships
- Self-directed, life-wide learning
- Learning for transfer
- Interdisciplinary studies
- Diagnostic assessments

Immersion


PASSPORT
Download from
Dreamstime.com
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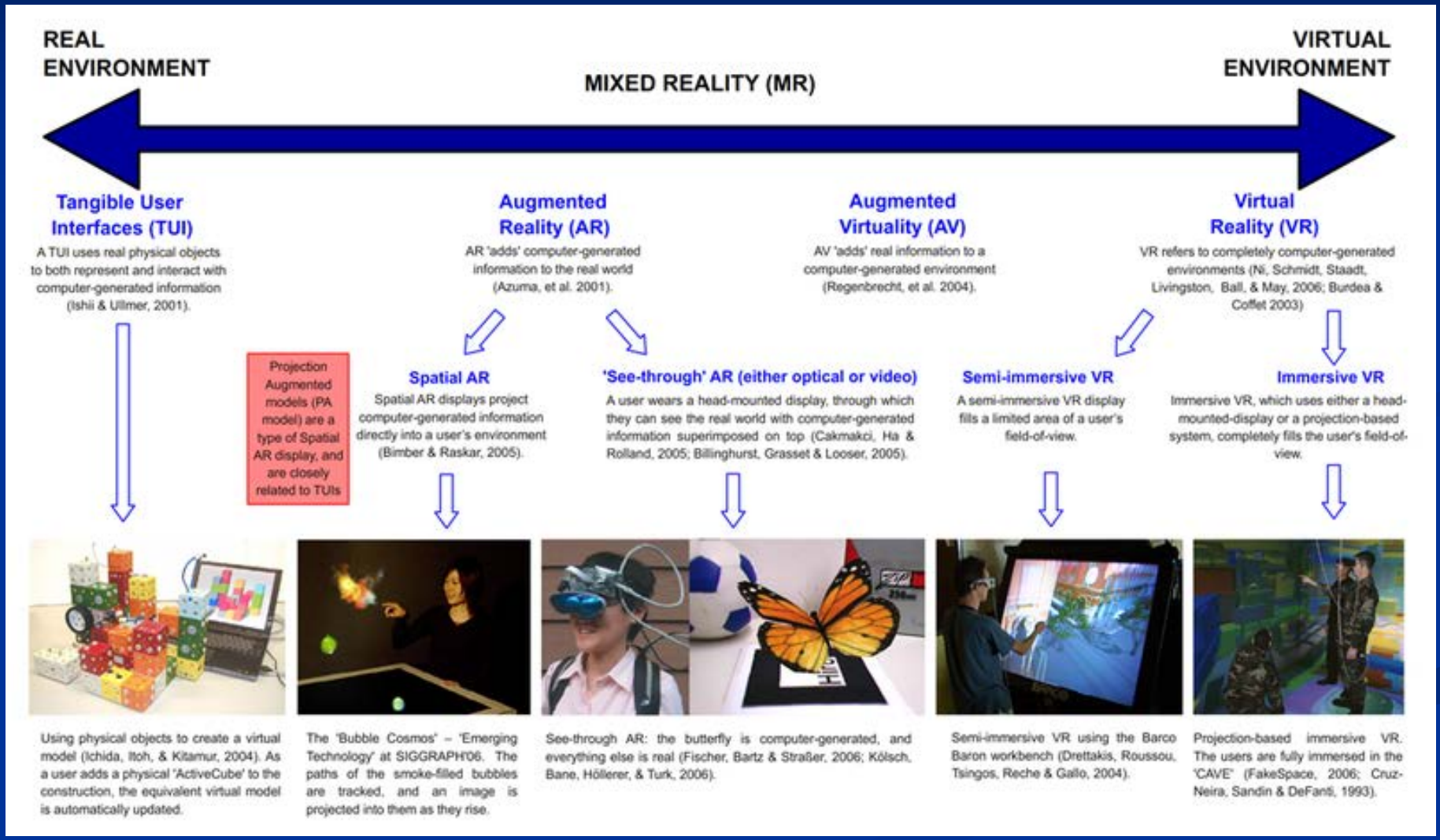
Continuum of *Immersive* Media



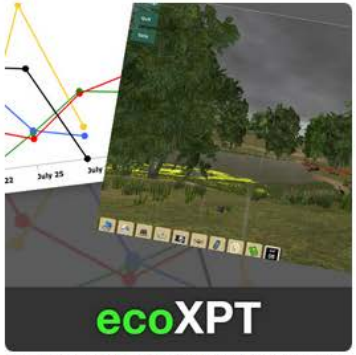
http://ecolearn.gse.harvard.edu

ecoMUVE ecoMOBILE ecoXPT ecoMOD PROJECT MEMBERS PUBLICATIONS NEWS BLOG CONTACT US Sign in

Welcome. EcoLearn is an educational research group at the Harvard Graduate School of Education that explores the use of advanced immersive technologies to support learning about the complex causal dynamics of ecosystems.

EcoMUVE is a curriculum that uses immersive virtual environments to teach middle school students about ecosystems and causal patterns.

EcoMOBILE is an extension of the EcoMUVE curriculum that blends immersive virtual environments and real ecosystems infused with digital resources.

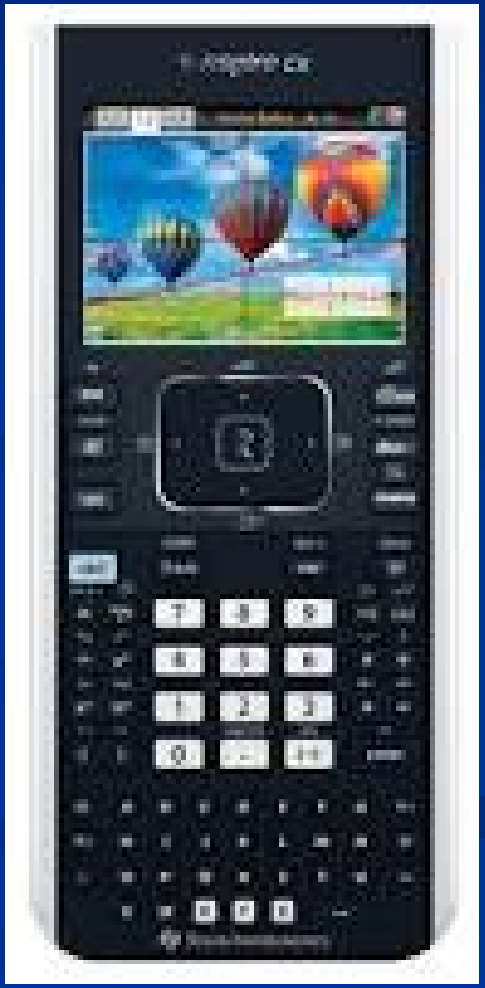


EcoXPT is a new project being designed to work alongside EcoMUVE to support experiment-based inquiry in immersive virtual environments.

The EcoMOD project will explore the power of immersive virtual environments to support computational thinking and ecosystem science learning in elementary grades.

1976

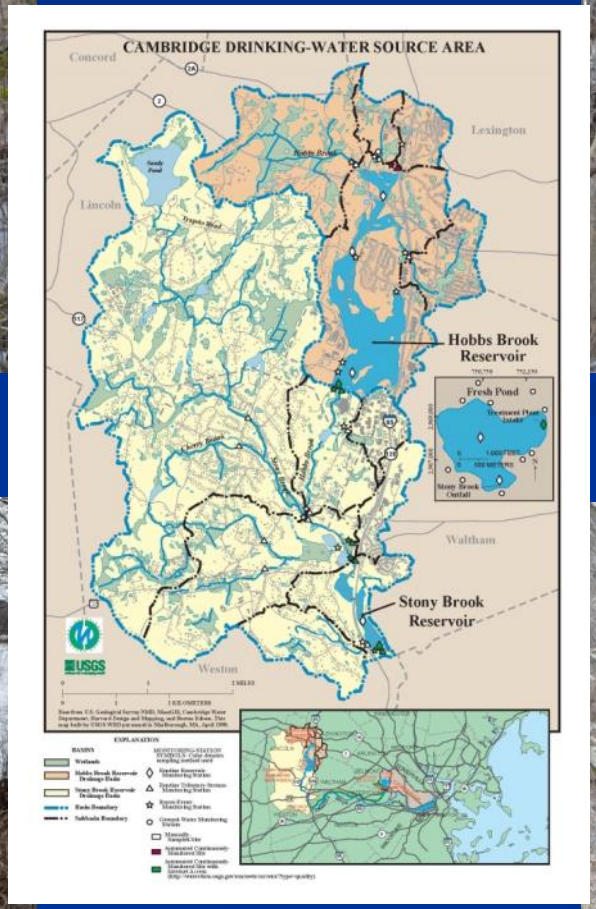
2018



Augmenting Real World Ecosystems

http://ecomobile.gse.harvard.edu

Virtual Binoculars



Interface for Your Digital Life

IN THE FUTURE YOUR MOBILE PHONE WILL ACT AS YOUR DIGITAL "6TH SENSE"

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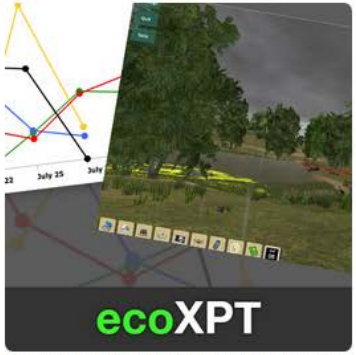

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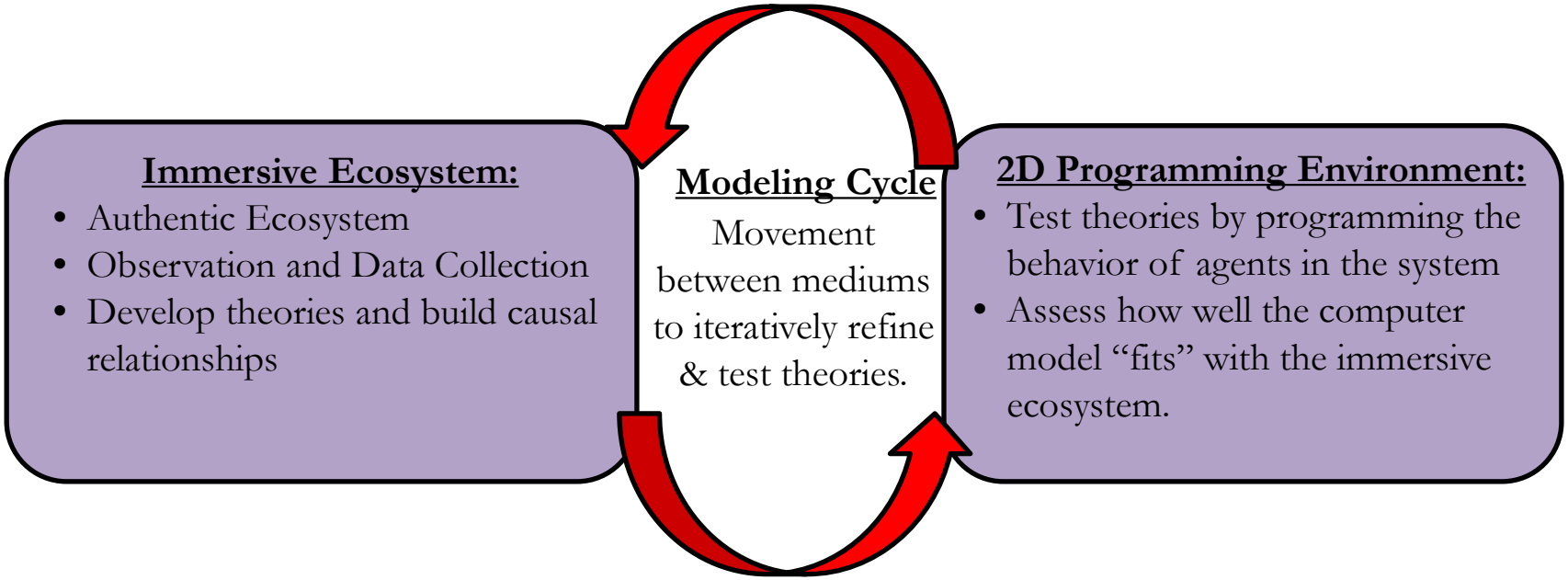
Supporting Inquiry through Modeling

Computational modeling and programming activities are integrated with an immersive ecosystem such that the epistemic goals of science are visible to young learners

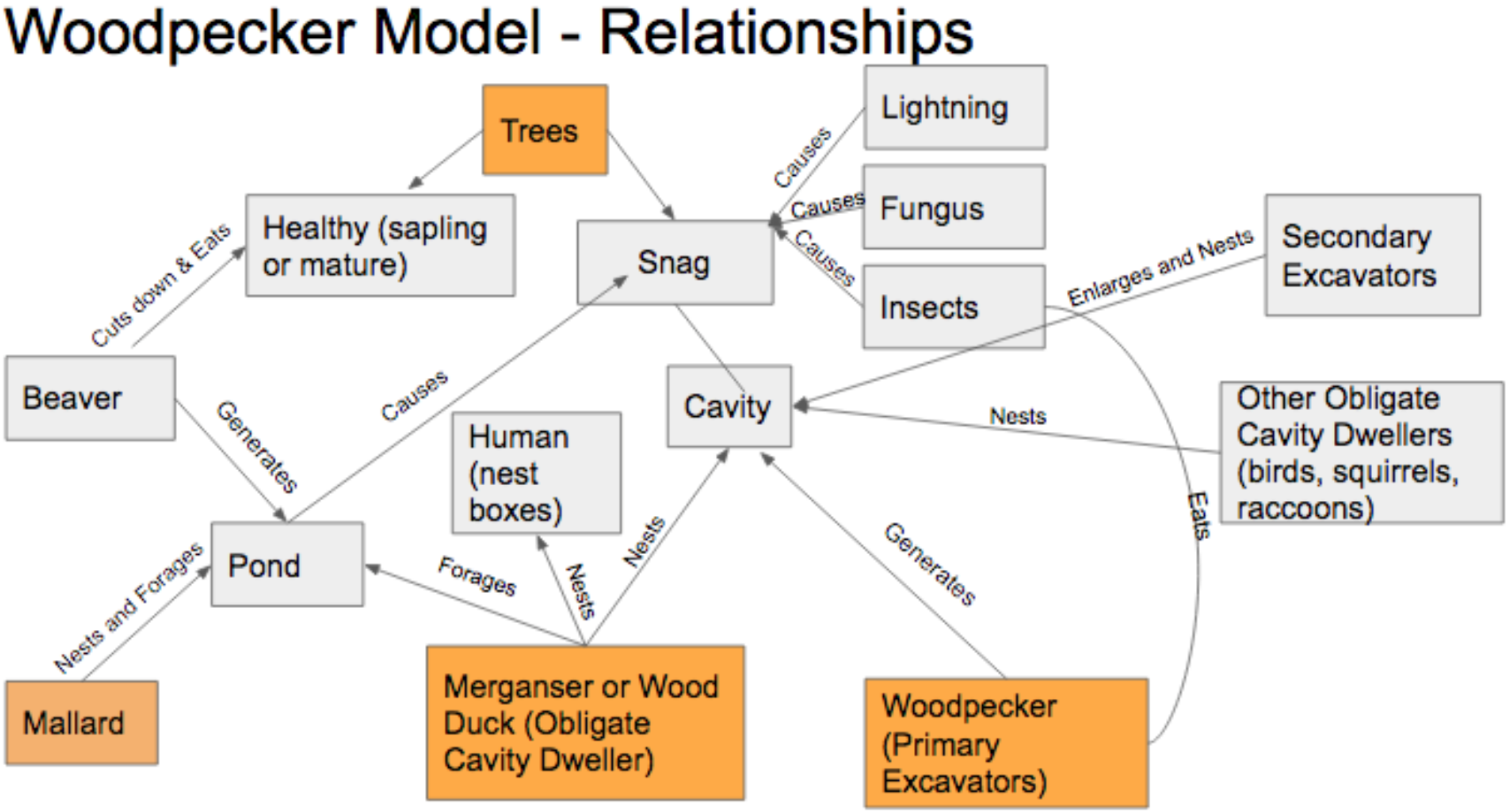


Immersive Ecosystem

Mixed hardwood forest spanning four distinct time periods

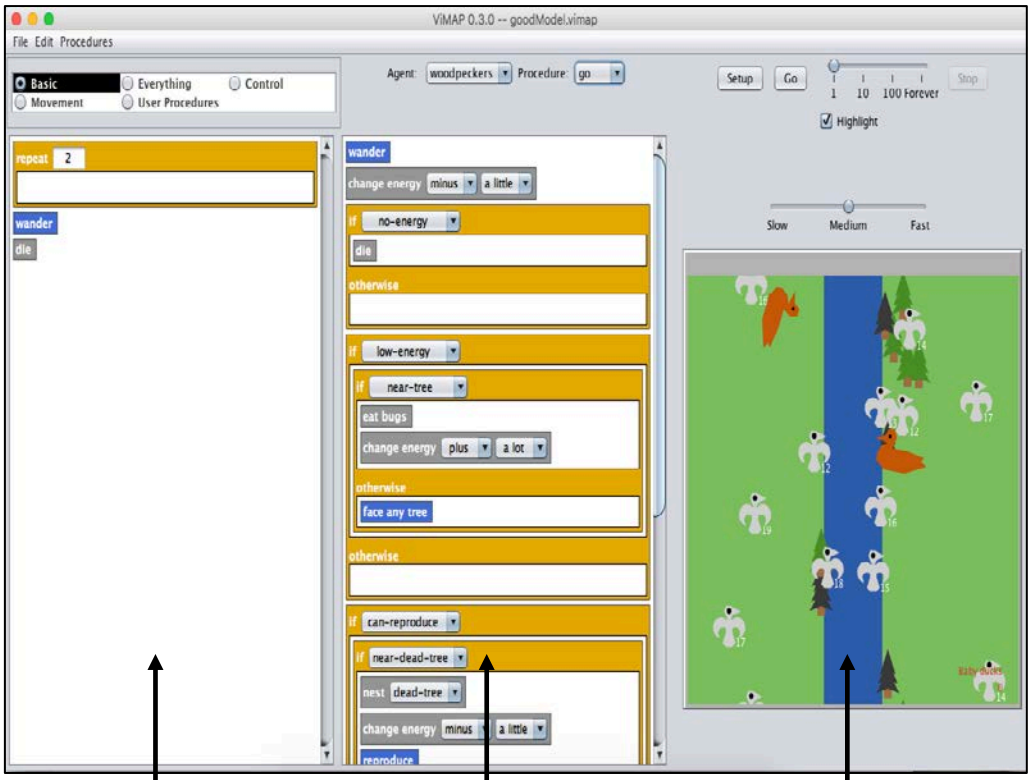
Perceptual overlays allow investigations of cause and effect from both overview and on-the-ground levels.

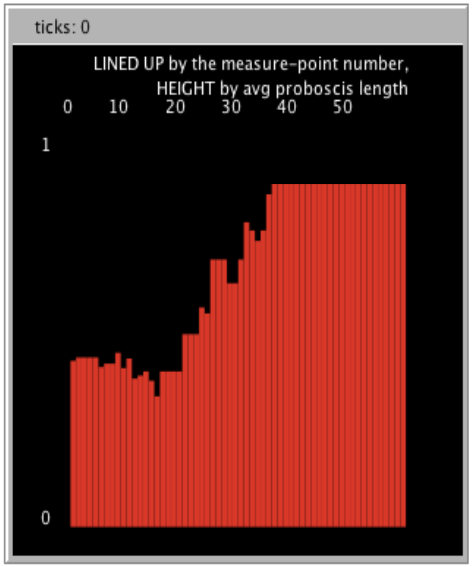
Woodpeckers as A Keystone Species



Programming Environment

ViMAP (Sengupta et al, 2015) programming environment utilizes a simple, scaffolded block interface, customized to focus on ecosystems modeling and designed specifically for younger children





Command Library

Program Construction

Enactment World

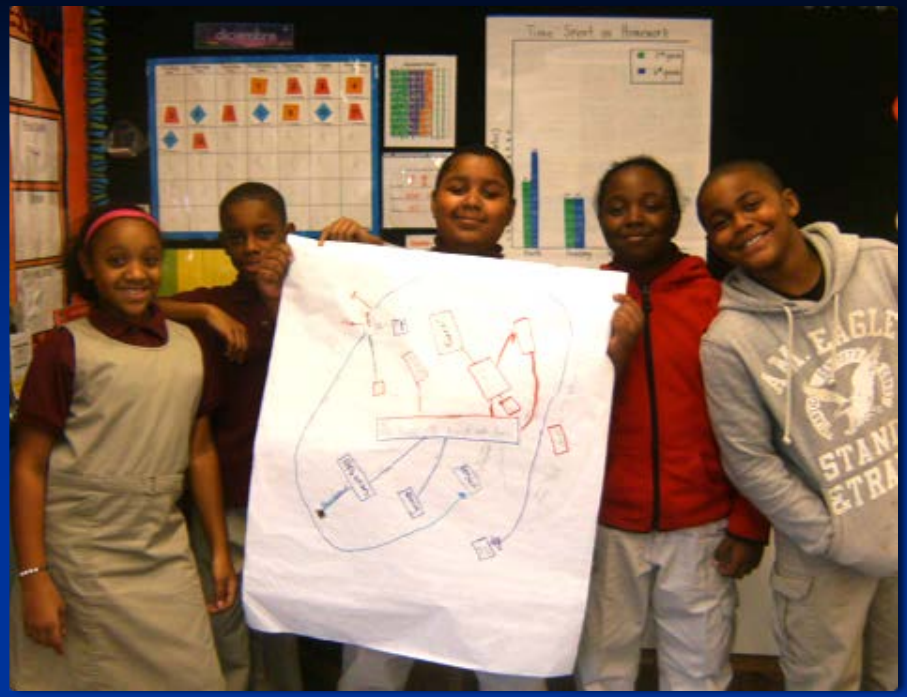
Grapher Window

Constructing explanations

"Were there measurements that surprised you? If so, tell us why?"

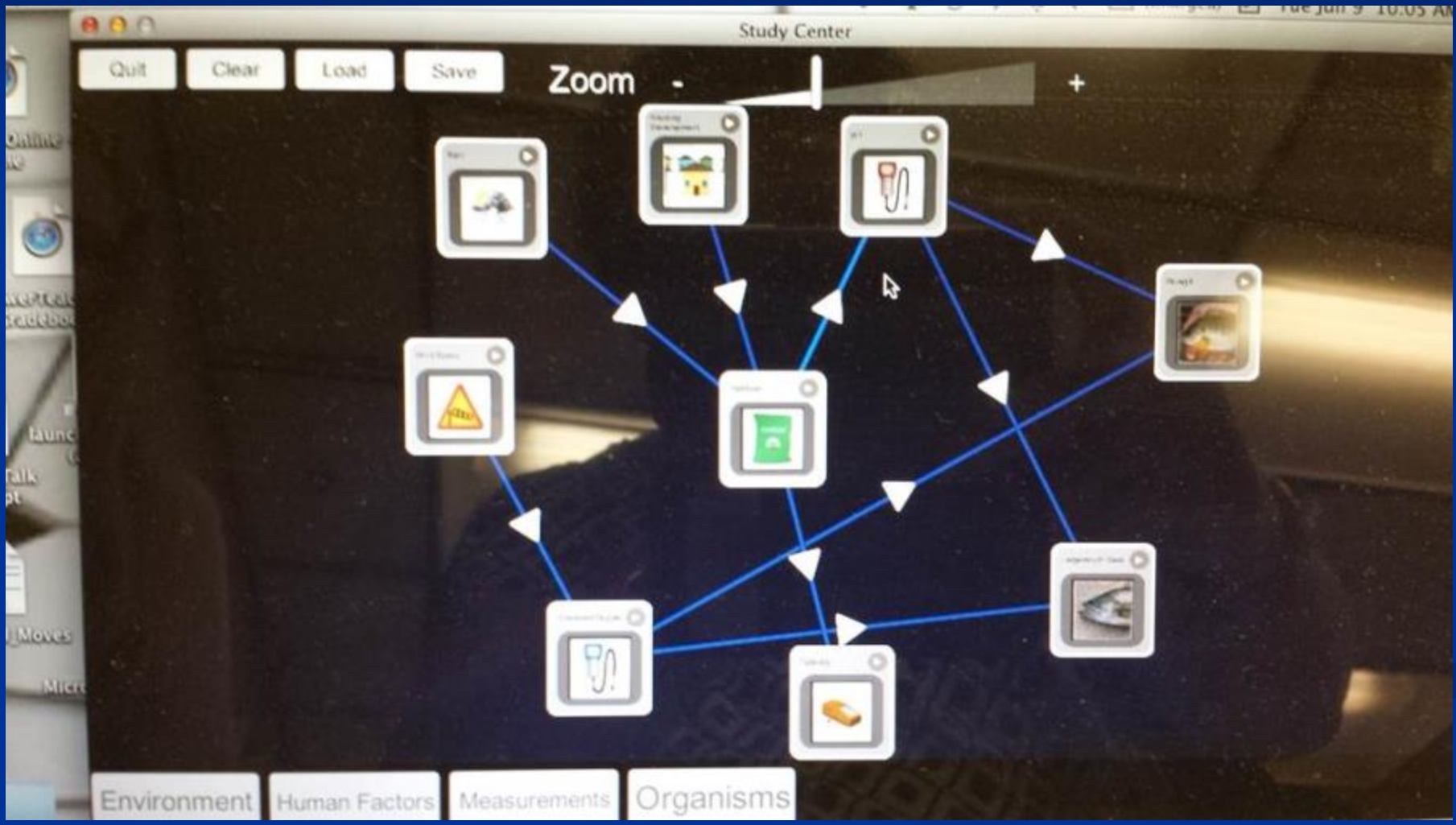
"Was the pond healthy? Explain why."

Students exposed to EcoMUVE provided richer explanations



Explanations included:
- plausible scientific mechanisms
- connections to prior knowledge
- comparison among variables

Concept Map Tool



Logfiles: Events, Chats, Notebooks…

Database of Logdata - Track students' behaviors: where they went, what data they collected, path to solve problem

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	administra	testID	eventID	stage	timestamp	locationX	locationY	locationz	locationYa	assetID	detail	studentID	Description
2	3141592	497	0	0	2009-12-08	0	0	0	0	1	1	102282	assessment started
3	3141592	497	1	1	2009-12-08	364	23	-76	0	2	10	102282	stage started
4	3141592	497	2	1	2009-12-08	263	10	-6	270	2	10	102282	stage started
5	3141592	497	3	1	2009-12-08	263	8	-6	270	14	1	102282	notebook opened
6	3141592	497	4	1	2009-12-08	263	7	-6	270	14	2	102282	nitrate tab clicked in notebook
7	3141592	497	5	1	2009-12-08	257	8	-397	0	143	20	102282	Arrow selection of Surface of the bay in front of the tent
8	3141592	497	6	1	2009-12-08	0	0	0	0	2	11	102282	stage ended
9	3141592	497	7	1	2009-12-08	0	0	0	0	2	13	102282	stage ended ungracefuly
10	3141592	497	8	1	2009-12-08	0	0	0	0	1	3	102282	
11	3141592	498	0	0	2009-12-08	0	0	0	0	1	1	102282	assessment started
12	3141592	498	1	1	2009-12-08	364	23	-76	0	2	10	102282	stage started
13	3141592	498	2	1	2009-12-08	263	10	-6	270	2	10	102282	stage started
14	3141592	498	3	1	2009-12-08	263	8	-6	270	14	1	102282	notebook opened
15	3141592	498	4	1	2009-12-08	263	7	-6	270	14	2	102282	nitrate tab clicked in notebook
16	3141592	498	5	1	2009-12-08	263	7	-6	270	14	3	102282	pop density tab clicked in notebook
17	3141592	498	6	1	2009-12-08	263	7	-6	270	14	4	102282	salinity tab clicked in notebook
18	3141592	498	7	1	2009-12-08	263	7	-6	270	14	2	102282	nitrate tab clicked in notebook
19	3141592	498	8	1	2009-12-08	263	7	-6	270	14	1	102282	notebook opened
20	3141592	498	9	1	2009-12-08	0	0	0	0	2	11	102282	stage ended
21	3141592	498	10	1	2009-12-08	0	0	0	0	2	13	102282	stage ended ungracefuly
22	3141592	498	11	1	2009-12-08	0	0	0	0	1	3	102282	
23	3141592	499	0	0	2009-12-08	0	0	0	0	1	1	102282	assessment started
24	3141592	499	1	1	2009-12-08	364	23	-76	0	2	10	102282	stage started
25	3141592	499	2	1	2009-12-08	263	10	-6	270	2	10	102282	stage started
26	3141592	499	3	1	2009-12-08	263	8	-6	270	14	1	102282	notebook opened
27	3141592	499	4	1	2009-12-08	263	7	-6	270	14	2	102282	nitrate tab clicked in notebook
28	3141592	499	5	1	2009-12-08	233	4	-5	291	3	4	102282	teleport KB kelp
29	3141592	499	6	1	2009-12-08	236	6	-4	291	2	11	102282	stage ended
30	3141592	499	7	4	2009-12-08	129	10	125	0	2	10	102282	stage started
31	3141592	499	8	4	2009-12-08	124	2	117	108	212	20	102282	Arrow selection of Striped surfperch
32	3141592	499	9	4	2009-12-08	123	0	123	0	107	22	102282	Population density reading for Bull kelp
33	3141592	499	10	4	2009-12-08	129	10	118	180	209	22	102282	Population density reading for Sea otter
34	3141592	499	11	4	2009-12-08	137	0	121	37	200	22	102282	Population density reading for Corraline algae
35	3141592	499	12	4	2009-12-08	133	0	117	0	111	24	102282	Temperature reading for Bay floor
36	3141592	499	13	4	2009-12-08	133	0	117	0	111	25	102282	Turbidity sample taken of Bay floor
37	3141592	499	14	4	2009-12-08	108	0	107	37	200	23	102282	Salinity reading for Corraline algae

GoPro Cameras Capture EcoMOBILE Experience

Tools for Transformational Insights

A Different Model of Pedagogy

- Experiences central, rather than information as pre-digested experience
- Knowledge is situated in a context and distributed across a community
- Reputation, experiences, and accomplishments as measures of quality

Core Principles of Professional Development

- Teachers teach as they were taught.
- The important issue is not technology usage, but changes in content, pedagogy, assessment, and learning outside of school.
- Continuous peer learning is the best strategy for long-term improvement.

Professional Development: Communities of "Unlearning"

- Developing fluency in using emerging interactive media
- Complementing presentational instruction with collaborative inquiry-based learning
- Unlearning almost unconscious assumptions and beliefs and values about the nature of teaching, learning, and schooling