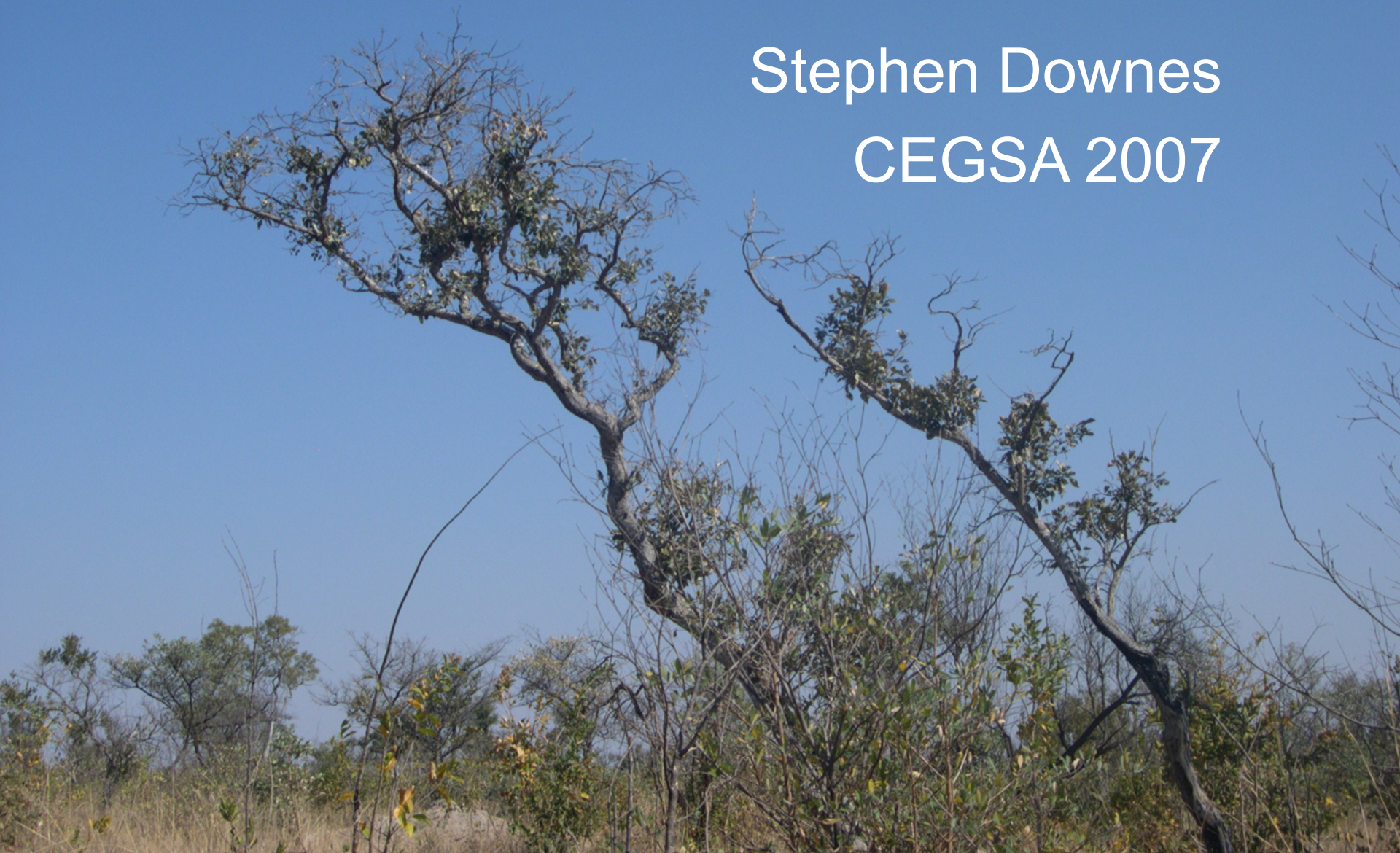


# How the Net Works

Stephen Downes

CEGSA 2007



# Models

## Testing An Experimental Universally Designed Learning Unit in a Graduate Level Online Teacher Education Course

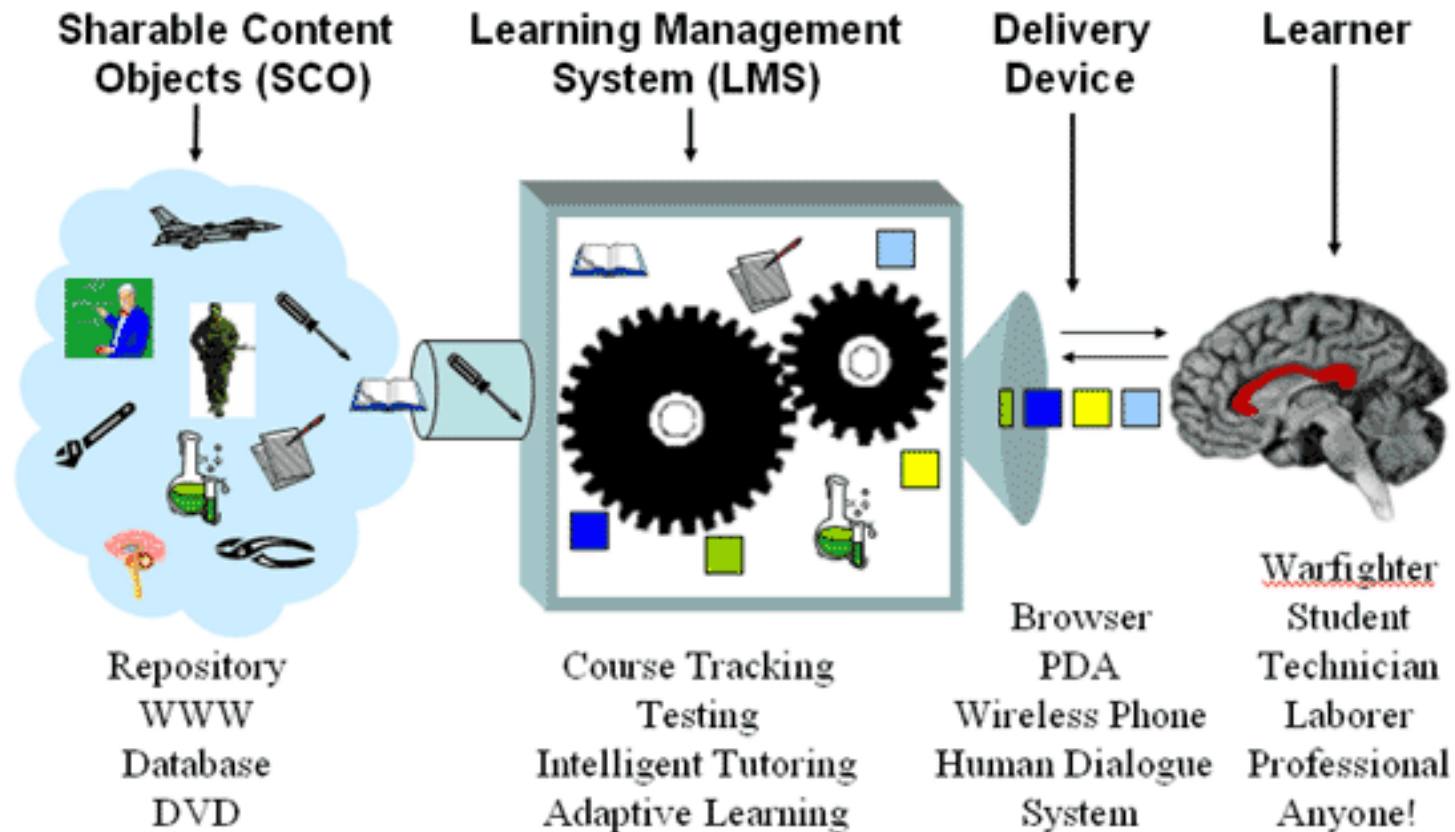
- Melissa Engleman and Mary Schmidt, MERLOT Journal of Online Learning and Teaching

85% 'SJ' (sensing, judging) population of teachers surveyed:

- 1.Focus on responsibility, study habits, teacher approval;
- 2.learns through identifying and memorizing facts and procedures, through repetition and drill;
- 3.prefers sequenced, step-by-step presentation of material;
- 4.sees 'fundamentals' as most important - sees little value in abstractions and theoretical principles;
- 5.prefers consistent, clearly defined procedures, order and structure; interested in what they and their classmates are 'supposed' to do;
- 6.when asked to invent own procedures, or given vague directions, may become distressed and falter in their work;
- 7.very detail-oriented, and interested in doing things 'the right way'; wants to know teacher preferences and expectations so they can conform to them exactly;
- 8.craves membership in groups, especially if they involve instructor approval.



# Transmission Model



# Learning is not Remembering

- empty words
  - ‘twas brillig’
  - words used without knowing meaning
- empty math
  - ‘counting change’
  - the stages of dart awareness (1) you can use multiplication (2) how to multiply (3) how dart players multiply

# Learning is not 'Content'

- Learning is a process of becoming rather than a process of acquiring
- To learn is to instantiate patterns of connectivity in the mind (in the neural net)
- You do not 'make meaning' or 'construct meaning', you grow meaning

# What Learning Really Is



- tacit knowledge

- personal knowledge



Polanyi

Ineffable

Depends on Context

You can't put it into words

You can't generalize it

Learning Is...



*Knowledge is like recognition*

*Learning is like perception*

*the acquisition of new patterns  
of connectivity*

*through experience*

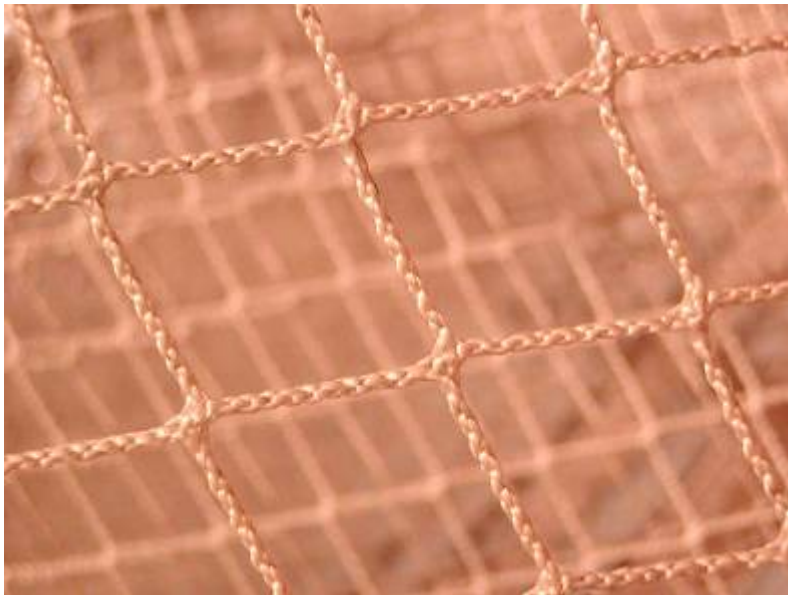


Hume



# Patterns in the Mesh

the knowledge is in the network



Old: universals

- rules
- categories

New: patterns

- patterns
- similarities

the knowledge *is* the network



Tenenbaum

You already know this phenomenon,  
you've already seen it

## Emergent Learning

<http://growchangelearn.blogspot.com/2007/02/emergent-learning.html>

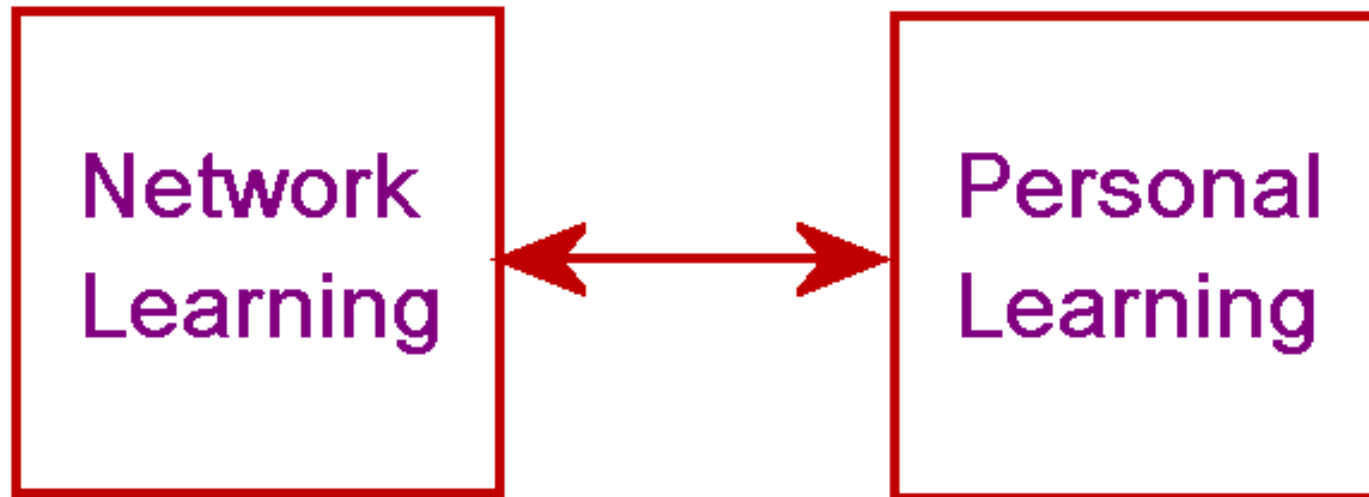
Tom Haskins



**"Now I get it"**  
**A-ha!**  
**"Out of the blue"**  
**"My mind leaped"**  
**"Did an about-face"**  
**"Shut up and did it"**  
**Sudden breakthrough**

<http://www.downes.ca/files/osn.html>

The way networks learn is the way people learn...



# Personal Learning

# Three Principles:

- *Interaction* – participation in a learning community (or a community of practice)
- *Usability* – simplicity and consistency
- *Relevance* – or *salience*, that is, learning that is relevant to you, now



# Interaction: Principles

- Pull is better than push...
- Speak in your own (genuine) voice (and listen for authenticity)
- Share your knowledge, your experiences, your opinions
- Make it a habit and a priority



# Usability: Principles

“... probably the greatest usability experts are found in the design labs of Google and Yahoo!”

- *Elements of Usability*
  - **Consistency** ... *I know what to expect...*
  - **Simplicity** ... *I can understand how it works...*

# Principles of Relevance

- Information is a flow, not a collection of objects
  - Don't worry about remembering, worry about repeated exposure to good information
- Relevance is defined by function, not topic or category
- Information is relevant only if it is available where it is needed

# Network Learning

This...

## Network Learning *Inputs*

- Hebbian associationism
  - based on concurrency
- Back propagation
  - based on desired outcome
- Boltzman
  - based on 'settling', annealing

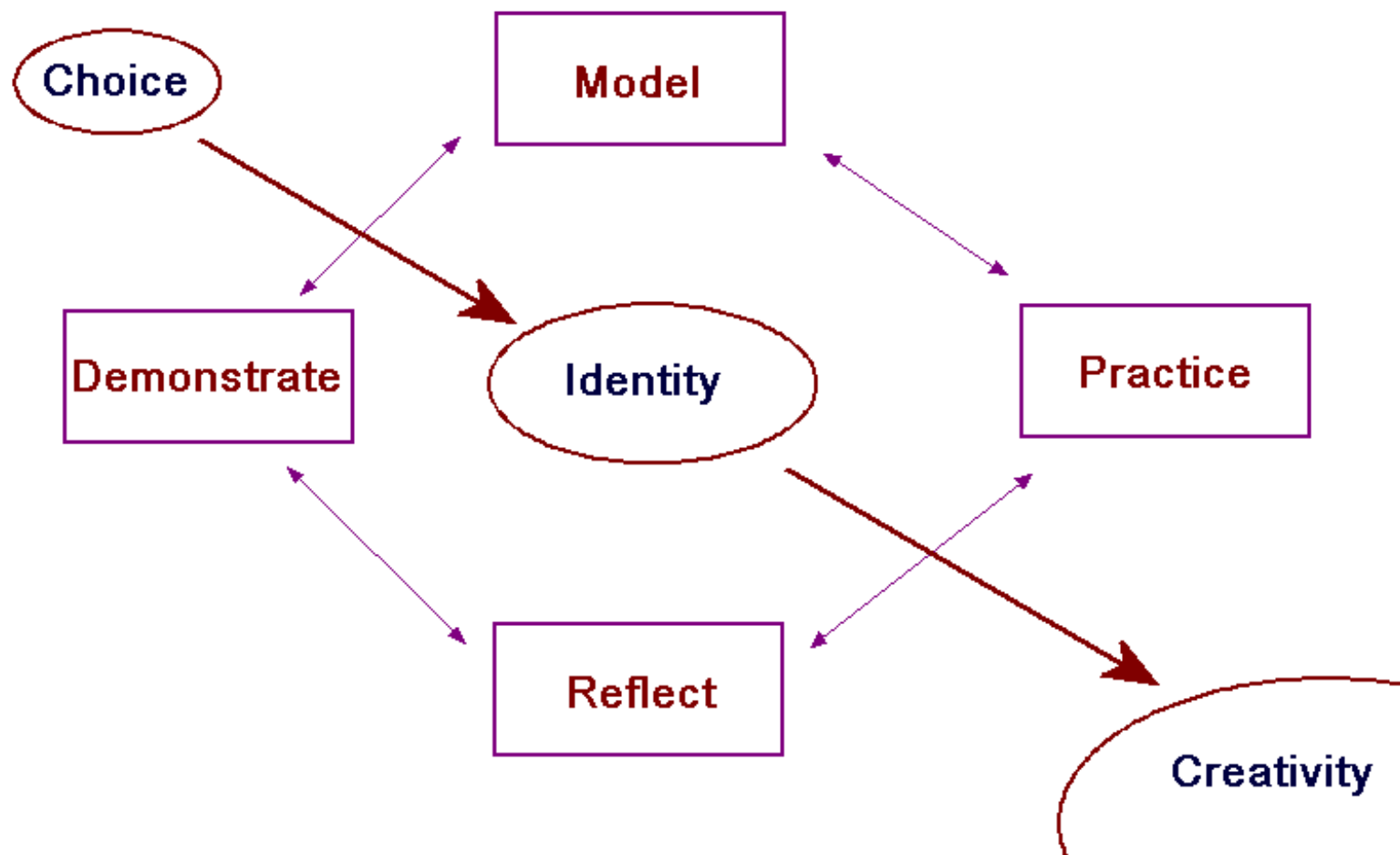
Leads to This...

Personal Learning...

To *teach* is to *model* and to *demonstrate*  
To *learn* is to *practice* and *reflect*







# Reliability

(AKA the Semantic Condition)

TODAY

SAFETY

GROUP

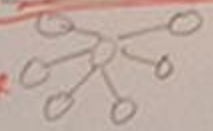
NATION  
LANGUAGE  
RELIGION

FUTURE  
AFFINITY

NETWORK

? POST-GROUP  
ORGANIZATIONS

TV  
RADIO  
BOOK, NEWSPAPER  
ALL-STAFF  
EMAIL



ONE  
WAY  
SCHOOL  
CLASS

Metallic - Elemental

UNITY

VISION  
STATEMENT

SOMETIMES EVEN: PURITY  
MELTING POT

COORDINATION

LEADERS' COLLABORATION

GROUP VALUE  
(= LEADER'S VALUE)

CLOSED

LEARNING OBJECTIVE  
LEARNING DESIGN

MEMBERSHIP / IN-CAMERA  
STANDARDS - JARGON  
WALLS - COPYRIGHT  
PATENTS

DISTRIBUTIVE

AKA  
TRICKLE DOWN

BROADCAST  
★ STARS AND GURUS

CENTRALIZED  
POWER - POWER LAWS

RICH



POOR

KNOWLEDGE,  
LIKE MONEY,  
FLOWS FROM  
AUTHORITY

TALKING  
TELEPHONE  
PERSONAL  
EMAIL



MANY  
WAYS

Organic - Biological

DIVERSITY

SALAD BOWL

AUTONOMY

PERSONAL  
LEARNING  
ENVIRON.

COOPERATION  
EXCHANGE

MUTUAL VALUE

PORTFOLIO?  
SELF-DIRECTED  
LEARNING

RSS  
HTML

OPENNESS

COMMUNITY OF  
PRACTICE

CONNECTION  
PERSPECTIVE / CONTEXT

CC.  
GPL

BRIDGES

IDENTITY

CONNECTIVE

CONVERSATION

DISTRIBUTED

DEMOCRACY

(OR POST-DEMOCRACY)

KNOWLEDGE  
EMERGES

SKYPE?  
PODCAST?

BLOGLINES

CORPORATE  
WEBSITE /  
PORTAL

LEARNING  
MANAGEMENT  
SYSTEM

LEARNING OBJ. METADATA  
MS-WORD

PASSWORDS  
ENTERPRISE

PODCAST  
VODCAST

TECHNICAL

# Diversity

- Did the process involve the widest possible spectrum of points of view? Did people who interpret the matter one way, and from one set of background assumptions, interact with people who approach the matter from a different perspective?

# Autonomy

- Were the individual knowers contributing to the interaction of their own accord, according to their own knowledge, values and decisions, or were they acting at the behest of some external agency seeking to magnify a certain point of view through quantity rather than reason and reflection?

# Openness

- Is there a mechanism that allows a given perspective to be entered into the system, to be heard and interacted with by others?



# Connectivity

- Is the knowledge being produced the product of an interaction between the members, or is it a (mere) aggregation of the members' perspectives? *A different* type of knowledge is produced one way as opposed to the other. Just as the human mind does not determine what is seen in front of it by merely counting pixels, nor either does a process intended to create public knowledge.

# Examples

We can get an idea of what the PLE looks like by drilling down into the pieces...

The question is – how to transport and represent models that are actually used?

## Model

- conceptual frameworks
  - wiki (wiki API, RSS)
  - concept maps (SVG, mapping format)
  - gliffy (SVG?)
- reference frameworks
  - Wikipedia
  - video / 2L 3D representation – embedded spaces

# Wiki...

- Associative learning:
  - provides examples to follow
  - allows correction and criticism
  - rethinking and rewriting
- Personal Learning:
  - engages interaction – genuine voice, experiences, opinions?
  - simple and consistent interface...?
  - accessible where & when I need it...?

# Wiki (cont)

- Reliability...
  - do I have diversity of sources (in wiki – means a threshold number)
  - are the sources autonomous
  - connectedness – links, etc?
  - open – can anyone contribute?

# Demonstrate

- reference examples
  - code library
  - image samples
- thought processes
  - show experts at work (Chaos Manor)
- application
  - case studies
  - stories

The question is, how can we connect the learner with the community at work?



# Image Samples...

- Associative learning:
  - provides examples to follow
  - allows correction and criticism...?
  - rethinking and rewriting – is reuse allowed?
- Personal Learning:
  - engages interaction – genuine voice, experiences, opinions? *personal* photos?
  - simple and consistent interface...?
  - accessible where & when I need it...? API?

# Wiki (cont)

- Reliability...
  - do I have diversity of sources (many photographers)
  - are the sources autonomous (compared to, say, newspaper photogs)
  - connectedness – links, etc? - *tagging*
  - open – can anyone contribute? can anyone view? use? vs., say Corbis

# Practice

- scaffolded practice
  - game interfaces
  - sandboxes
- job aids
  - flash cards
  - cheat sheets
- games and simulations
  - mod kits
  - mmorpgs

The question is, how can we enable access to multiple environments that support various activities?

# Second Life...

- Associative learning:
  - provides examples to follow?
  - allows correction and criticism...?
  - rethinking and rewriting – is reuse allowed?
- Personal Learning:
  - engages interaction – genuine voice, experiences, opinions? *personal* identity?
  - *simple* and consistent interface...?
  - accessible where & when I need it...? API?

# Wiki (cont)

- Reliability...
  - do I have diversity (many worlds?)
  - autonomy? How is the world?
  - connectedness – links, etc? – *slurls, any APIs?*
  - open – can anyone contribute? can anyone view? use?

The question is, how can we assist people to see themselves, their practice, in a mirror?

## Reflection

- guided reflection
  - forms-based input
  - presentations and seminars
- journaling
  - blogs, wikis
- communities
  - discussion, sharing

# Blogs...

- Associative learning:
  - provides examples to follow
  - allows correction and criticism...?
  - rethinking and rewriting – a weakness of blogs?
- Personal Learning:
  - engages interaction – genuine voice, experiences, opinions? Pull vs push
  - simple and consistent interface...? Blogger
  - accessible where & when I need it...? RSS , Blogger API

# Wiki (cont)

- Reliability...
  - Diversity of sources (many bloggers)
  - autonomous sources, mostly (watch out for corporate blogs, newspaper blogs)
  - connectedness – links, etc? – *tagging*, *trackback*
  - open – anyone can contribute, can anyone view? (compare with, eg. Facebook, LiveJournal)