

Connectivism, Online Learning, and the MOOC

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June 15, 2013

WizIQ MOOC

**Going Beyond the MOODLE MOOC for Active
Lifelong Learning**



Knowledge

- Networks as Knowledge
- Emergence
- Distributed Representation
- Association
- Meaning
- Personal v Public Knowledge

Learning

- ‘Downes Theory’ of Pedagogy
- Personal Learning
- Network-Based Assessment
- Personal Learning Environments
- Personal Learning

Community

- Education and Democracy
- Collaboration and Cooperation
- Autonomy
- Diversity
- Openness
- Interactivity



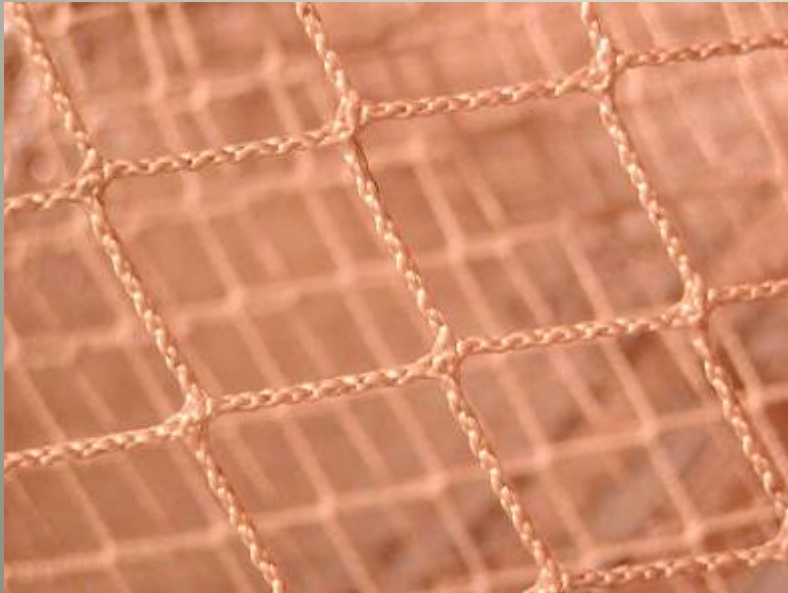
Knowledge

Three Kinds of Knowledge

- Qualitative – properties, qualities, relations
- Quantitative – number, mass, proportion
- Connective – patterns, networks, causes, impacts

What 'knowing' is...

the knowledge is in the network



Old: universals

- rules
- categories

New: patterns

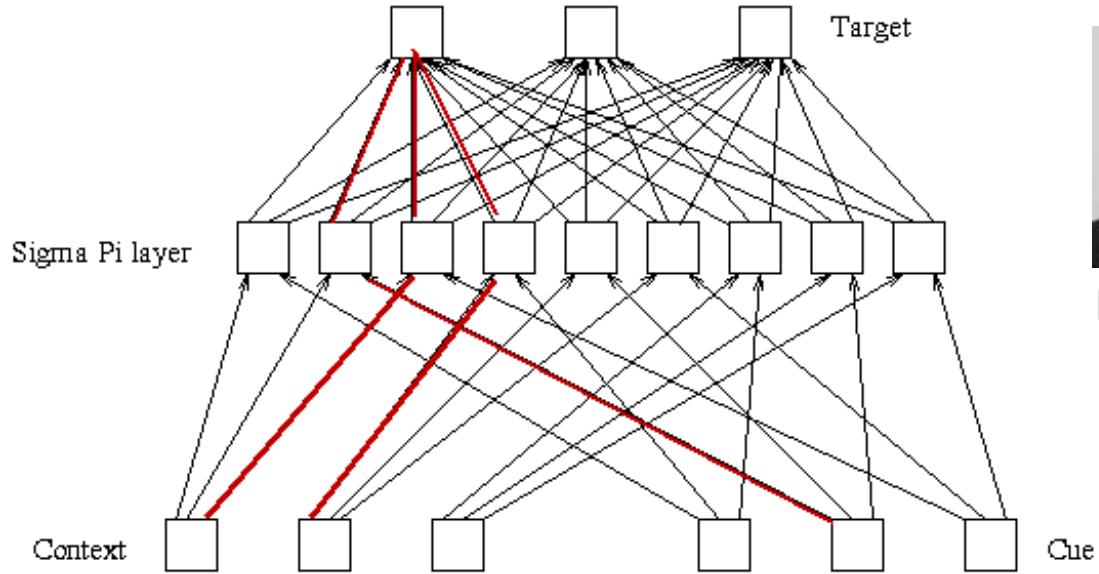
- similarities
- coherences

the knowledge *is* the network

Emergence

- How we perceive patterns of connectivity
 - Take the actual connections, and interpret them as a distinct whole
 - Take the distinct whole, and interpret as a set of connections
- As [Hume](#) would say, our 'perception' of a causal relationship between two events is more a matter of 'custom and habit' than it is of observation.

stands for?



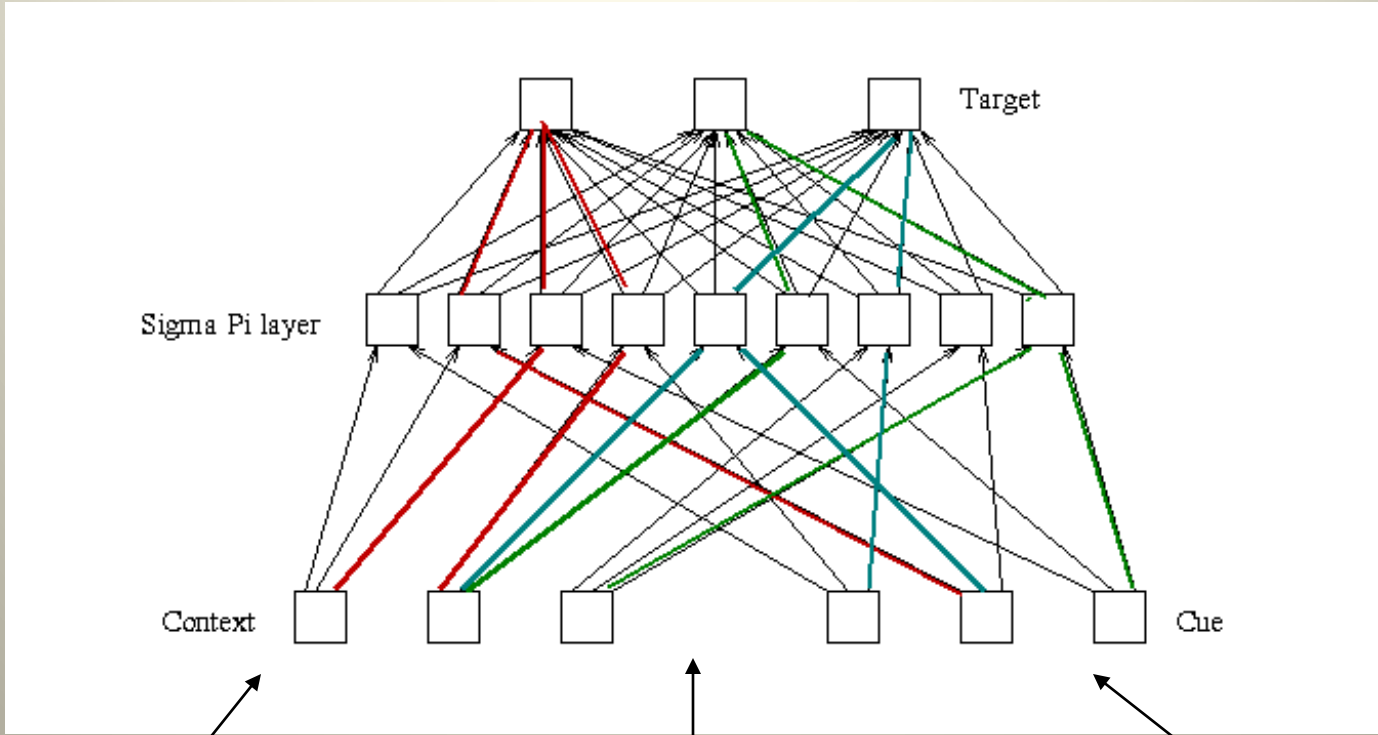
Hopfield

Or is caused by?

Distributed Representation

= a pattern of connectivity





Meaning

- Traditionalist theories – ‘meaning’ is the state of affairs represented or described
- But what about ‘redness’, or ‘17’, or ‘power law?’
- the concept of 'redness' in our own mind is similar to having 'liberal' as a description of a political party – it is composed of the organization of low-level non-meaningful entities

Organization

- Personal knowledge: The organization of neurons
- Public Knowledge: The organization of artifacts
- A common underlying logic: graph theory, connectionism, social network theory, etc.
- If a human mind can come to 'know', and if a human mind is, essentially, a network, then any network can come to 'know', and for that matter, so can a society.

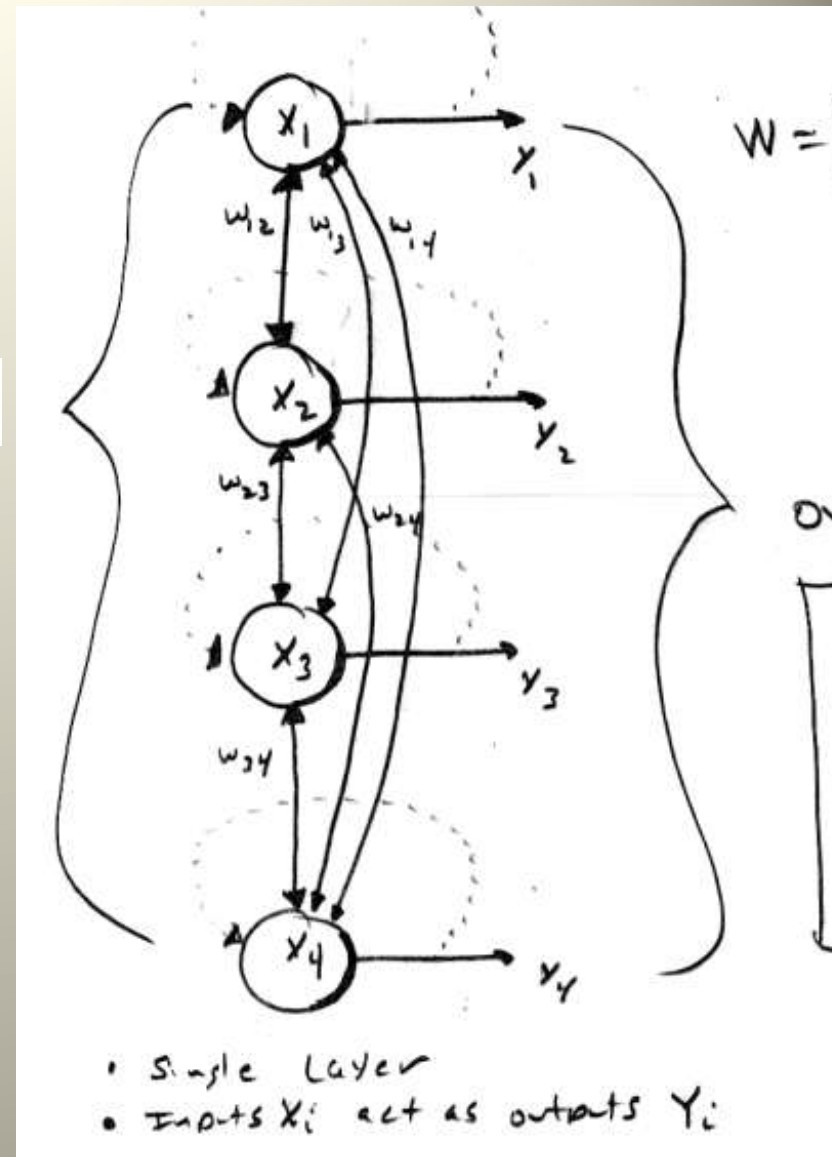
Learning



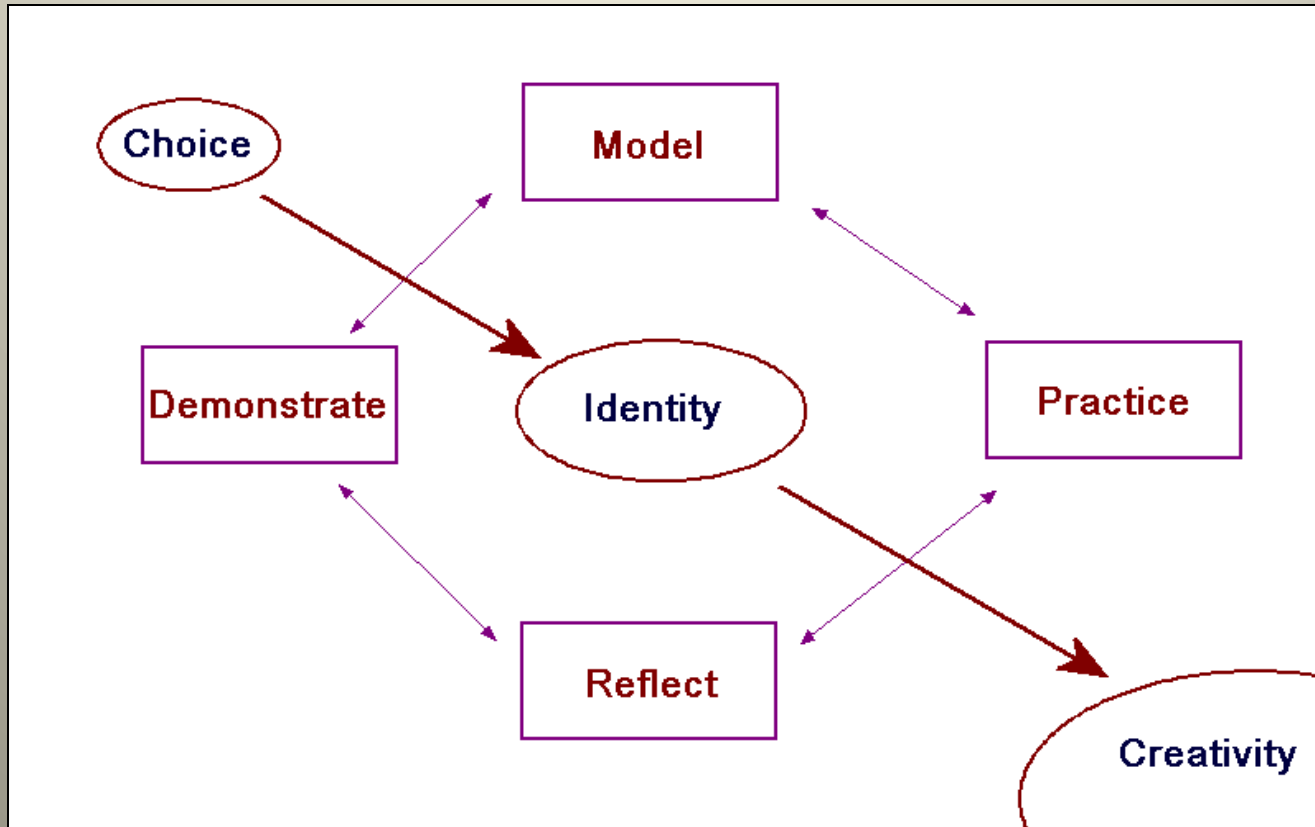
This...

Network Learning... Inputs

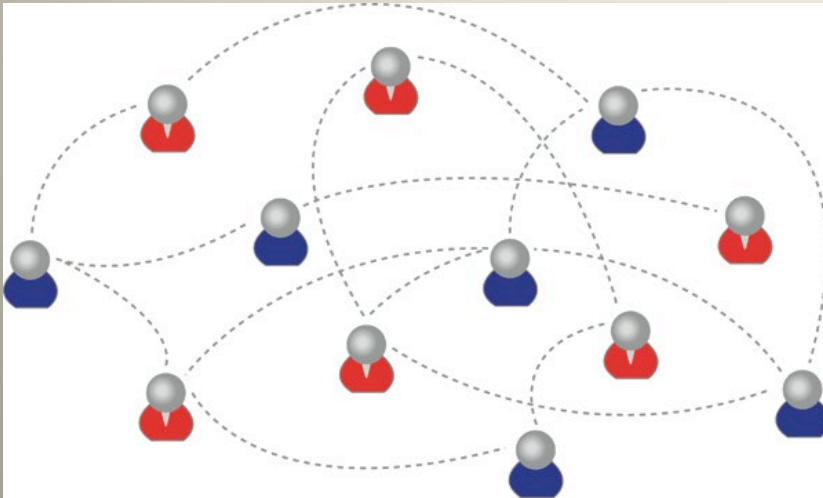
- Hebbian associationism
 - based on concurrency
- Back propagation
 - based on desired outcome
- Boltzman
 - based on 'settling', annealing



'Downes Theory' of Pedagogy



Personal Learning



We are using one of these

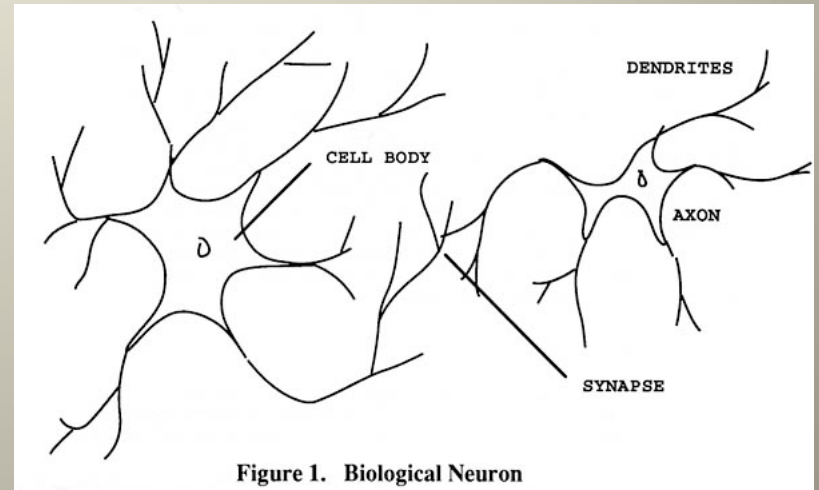
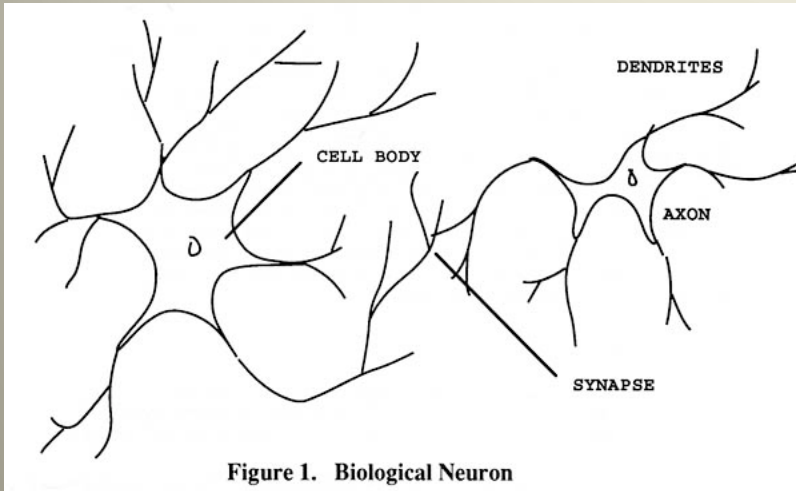


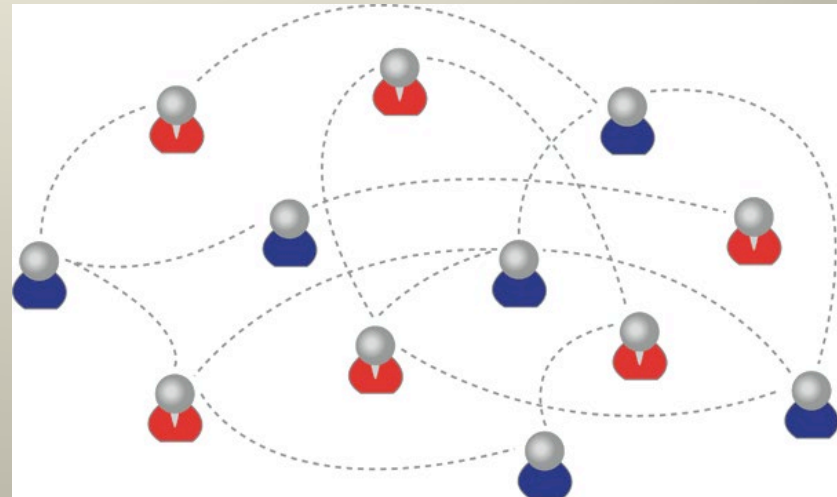
Figure 1. Biological Neuron

To create one of these

Network-Based Assessment



We recognize this

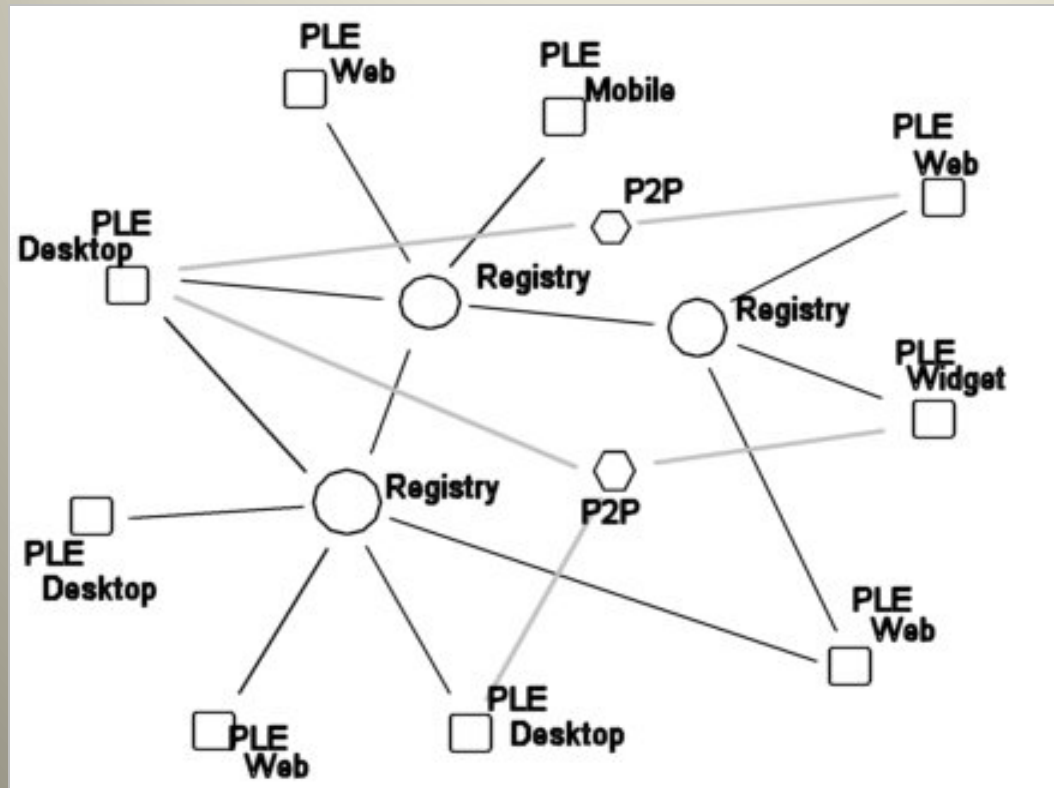


By performance in this

Personal Learning Environment

A PLE is a tool intended
to *immerse yourself*
into the workings of a
community

PLEs in a Network



PLEs are envisioned as working as a network

Personal Professional Development

- Most important to manage your own professional development
- The phrase in English is “eat your own dog food” – use the practices to teach yourself
- Form, create, and work with networks of other professionals

Downes on Personal Professional Development

<http://www.downes.ca/presentation/217>



Community

Education and Democracy

- Education is not about remembering a body of predefined content
- It is about the citizens communicating what they know with each other
- It follows that OERs are necessary for this democratic vision of education
- The *owners* of education are the citizens of a society, not the governments and corporations

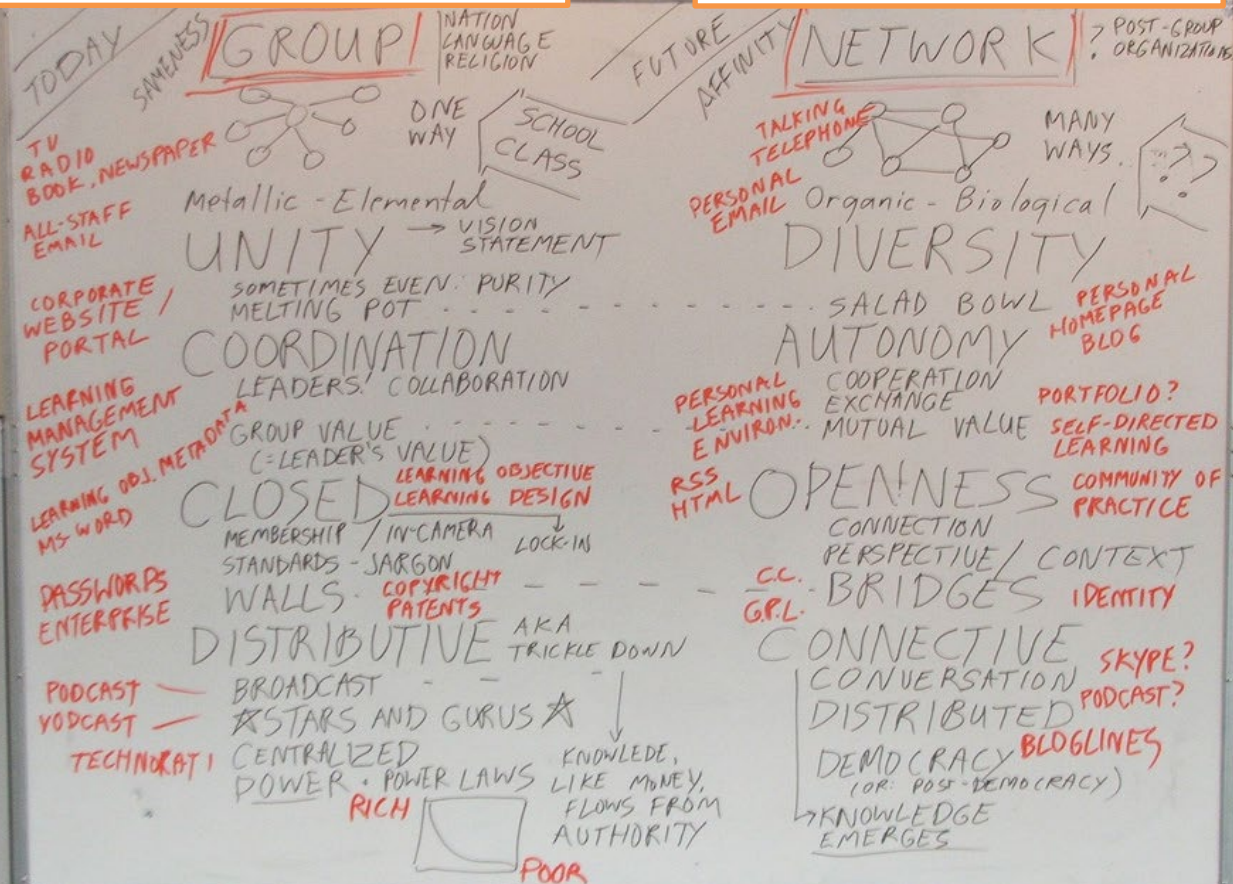
Papert and Freire on the Future of School

<http://www.papert.org/articles/freire/freirePart1.html>

Elements of Cooperation

COLLABORATION

COOPERATION



Principles of Effective Design (2)

- Semantic (intentional) principles:
 - Autonomy
 - Diversity
 - Openness
 - Interactivity

Autonomy

- Factors affecting mental states
 - Empirical, cognitive, psychological
- Capacity to act on mental states
 - Physical, social, structural, resources
- Scope and range of autonomous behaviour
 - Expression, association, selection, method...
- Effects of autonomous behaviour
 - Impact, improvement

Diversity

- Composition
 - Many types of entities
- Intention
 - Different goals, desires (Mill)
- Perspective
 - Uniqueness of point of view, language
- Mathematics of diversity
 - Multiple inputs produce mesh networks

<http://lemire.me/fr/abstracts/DIVERSITY2008.html>

http://www.huffingtonpost.com/stephen-downes/democratizing-education_b_794925.html

Diversity (2)

- Putnam, Florida, and the rest of it
- Homophily and associationism

<http://www.downes.ca/post/53544>

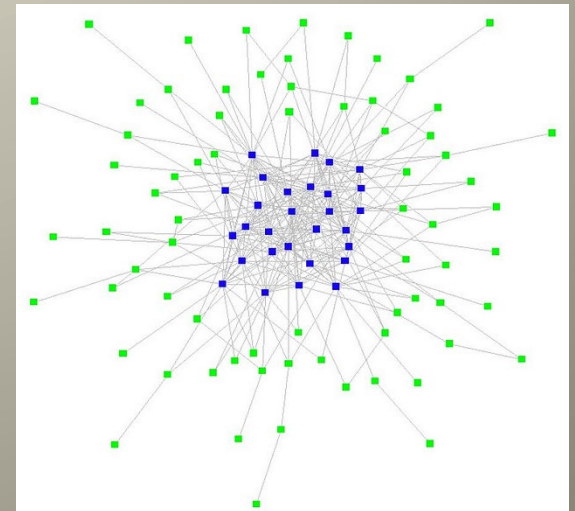
<http://profesorbaker.wordpress.com/2011/01/30/homophily-and-heterophily-what-fires-together-wires-together-cck11/>

- Teaching what we have in common instead of our differences? No

<http://secondlanguagewriting.com/explorations/Archives/2007/August/TheDownsideofDiversity.html>

Openness

- Open education
 - Open content, teaching, assessment
 - Stages of openness and terminal path
- Open networks
 - Clustering instead of grouping
- Flow
 - Input, output, feedback
 - plasticity



The Importance of Open Educational Resources

- Enables people to pursue their own personal interests in their own way
- But, more importantly, OERs become the *medium of communication*
- We need to view OERs, not as resources created by publishers at great cost, but as created by learners to interact with each other
- The role of professionals and publishers becomes the production of 'seed OERs'

Interactivity

- Influence vs emergence
 - Thought-bubbles – “we perceive wholes where there are only holes”

<http://www.downes.ca/post/55001>

- ‘Scope’ vs ‘Level’

– <http://www.downes.ca/post/42066>



- Ontology of emergence
 - Ontological (real) vs perceptual (recognized)
- Connection to complexity & chaos
 - <http://connect.downes.ca/post/44222>

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<http://www.downes.ca>

