Personal Learning the Web 2.0 Way

Stephen Downes
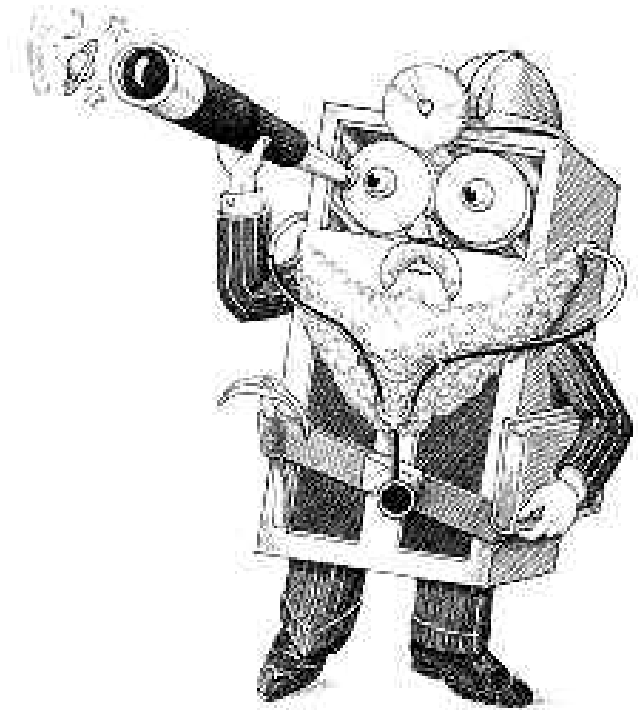
May 20, 2007

Overview

- AI and Expert Systems

- Learning Design

- The Connectivist Alternative
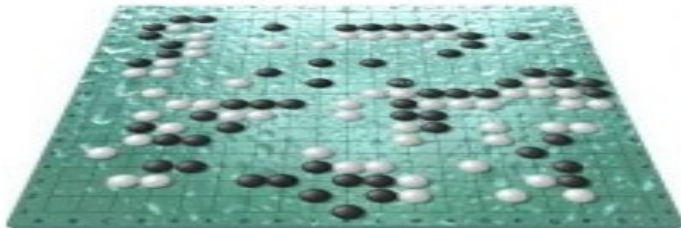
- Personal Learning

Expert Systems

- Two major aspects:
  - Representation
  - Inference engine
- Analogy: the wizard

http://en.wikipedia.org/wiki/Expert_system

http://www.atariarchives.org/deli/expert_systems.php

Properties of Expert Systems

- Expert systems are goal oriented

- Good expert systems are efficient

- Expert systems should be adaptive

http://www.expertise2go.com/webesie/tutorials/ESIntro/

AI Requires…

- Knowledge Acquisition
  - Subject matter expert
- Knowledge Representation
  - Eg. creation of resources
- Knowledge Encoding
  - Eg. creation of if-then structures

http://www.eco.utexas.edu/faculty/Norman/long.extra/Info.S98/Exp/intro.html

Learning Design

- "Much of the work on Learning Design focuses on technology to automatically "run" the sequence of student activities (facilitated by the educator via computers), but an activity in a Learning Design could be conducted without technology."

  – James Dalziel

http://blog.worldcampus.psu.edu/index.php/2007/05/16/learning-design-and-open-source-teaching/

http://zope.cetis.ac.uk/lib/media/WhatIsLD_web.pdf

IMS Learning Design

- Based on Education Modelling Language (Rob Koper)

- Examples…
  - Programmed instruction
  - Role play
  - Competency-based learning

- Idea that LDs are "pedagogically neutral"

http://www.imsglobal.org/learningdesign/ldv1p0/imsld_bestv1p0.html
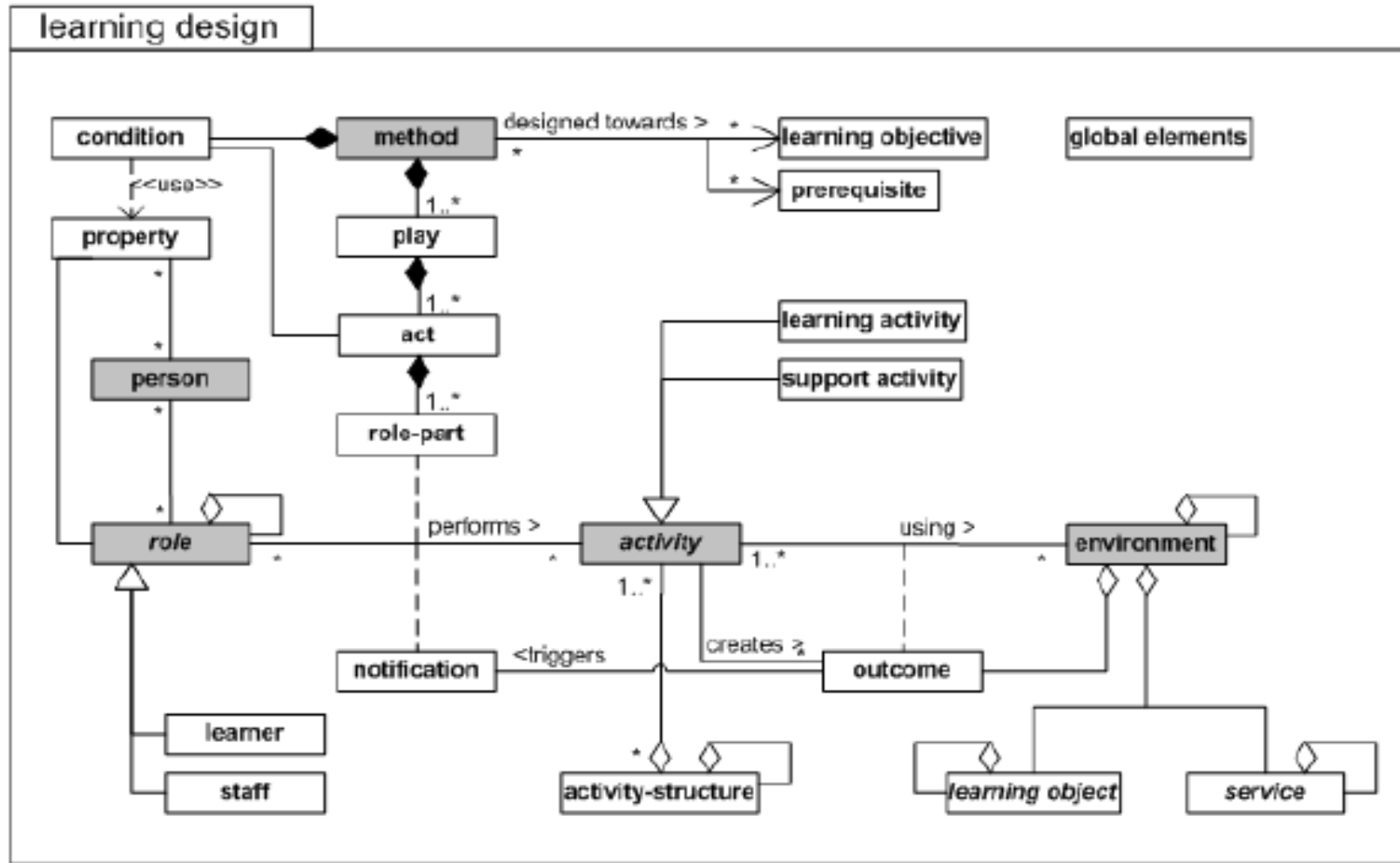
Competency-Based Learning
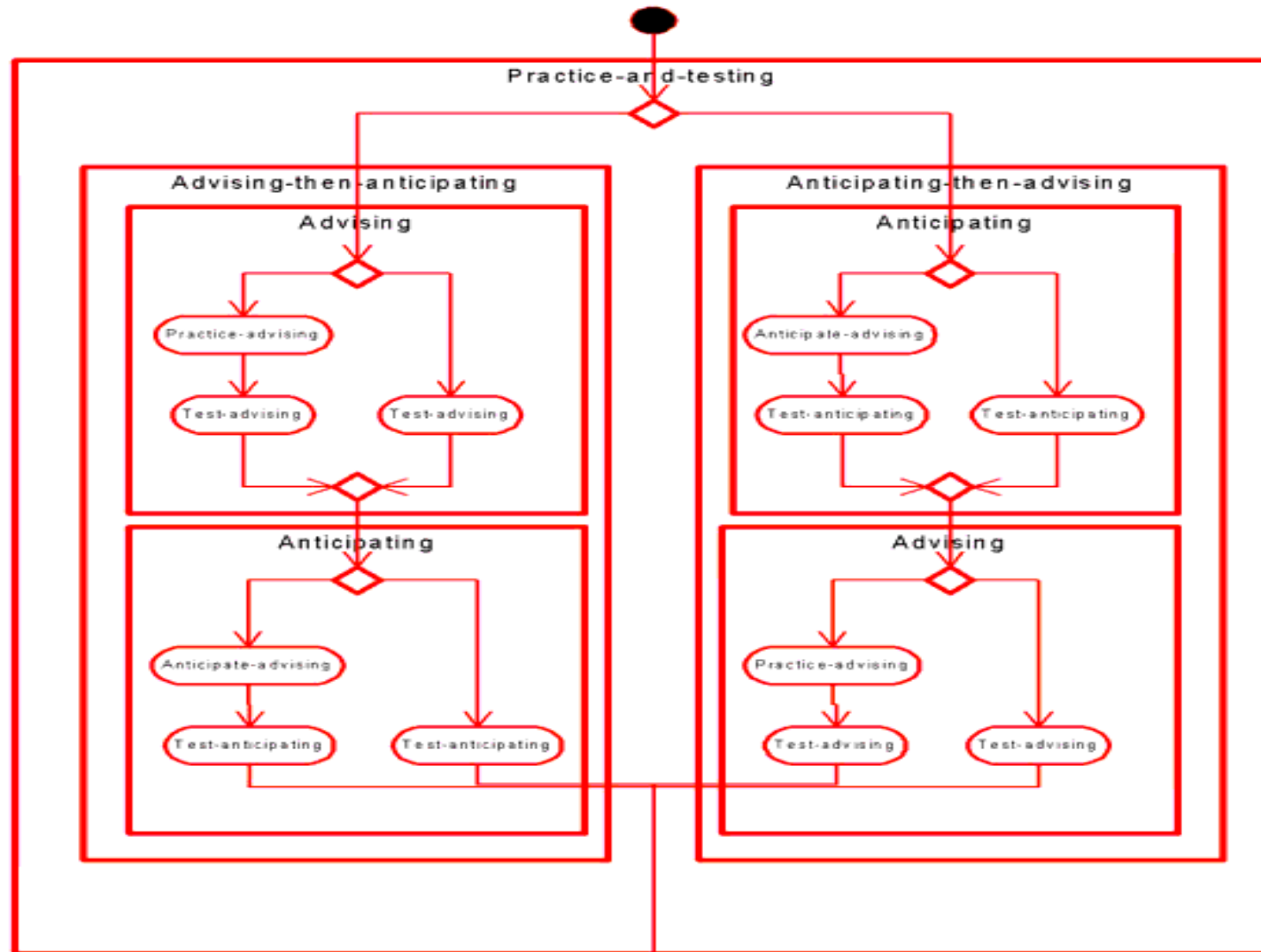
LD: Conceptual Model

Figure 1. The conceptual model of IMS Learning Design

Koper   http://www.ifets.info/journals/9_1/3.pdf

LD Tools

Nr.	Tool Name	Link	Author	Levels
1	**CopperAuthor**	www.copperauthor.org	OUNL	A
2	**Reload LD Editor**	www.reload.ac.uk/ldeditor.html	Reload	A,B,C
3	**ASK LDT**	www.ask.iti.gr	University of Piraeus	A,B
4	**Mot+**	www.licef.teluq.uquebec.ca/gp/eng/productions/mot.htm	University of Quebec	A
5	**Cosmos**	www.unfold-project.net:8085/UNFOLD/general_resources_folder/cosmos_tool.zip	University of Duisburg	A,B

Berggren et.al.   http://jime.open.ac.uk/2005/02/

The Lego Metaphor

Berlanda & Garcia   http://jime.open.ac.uk/2005/11/
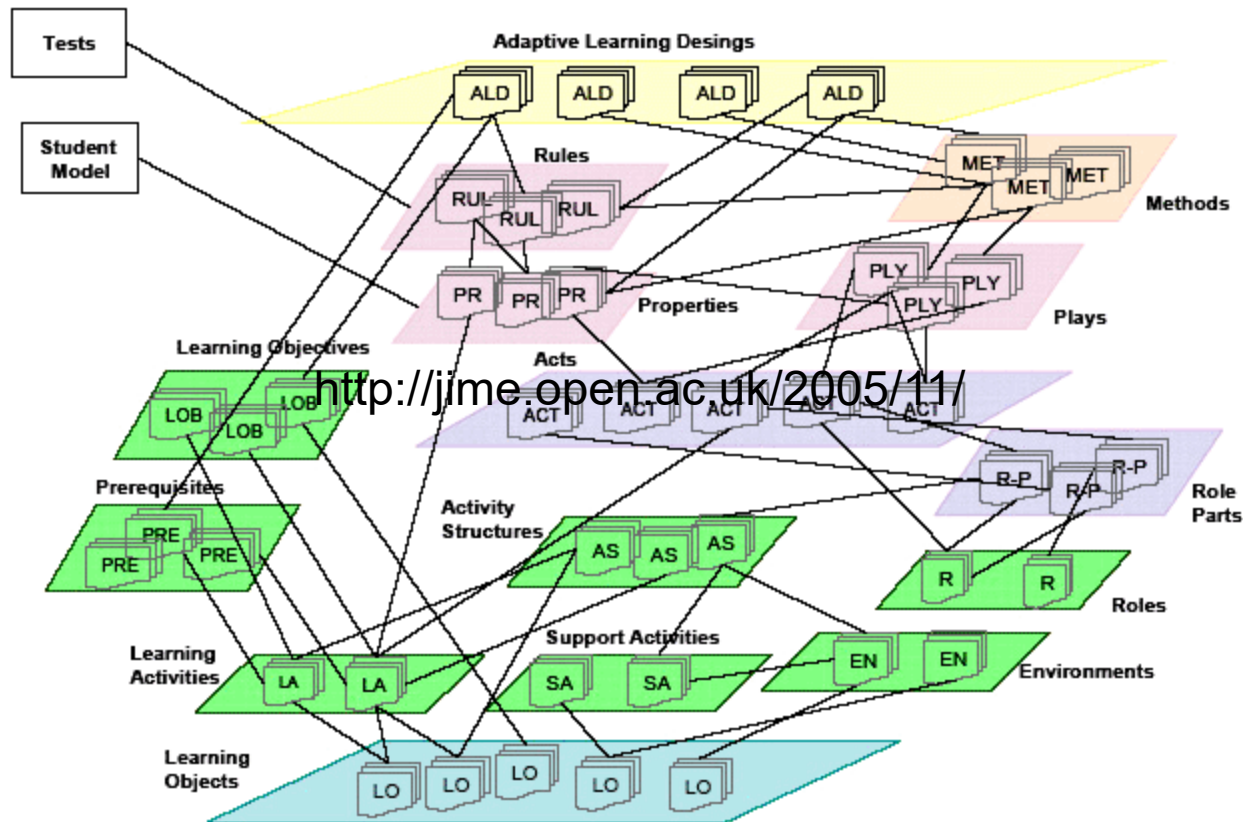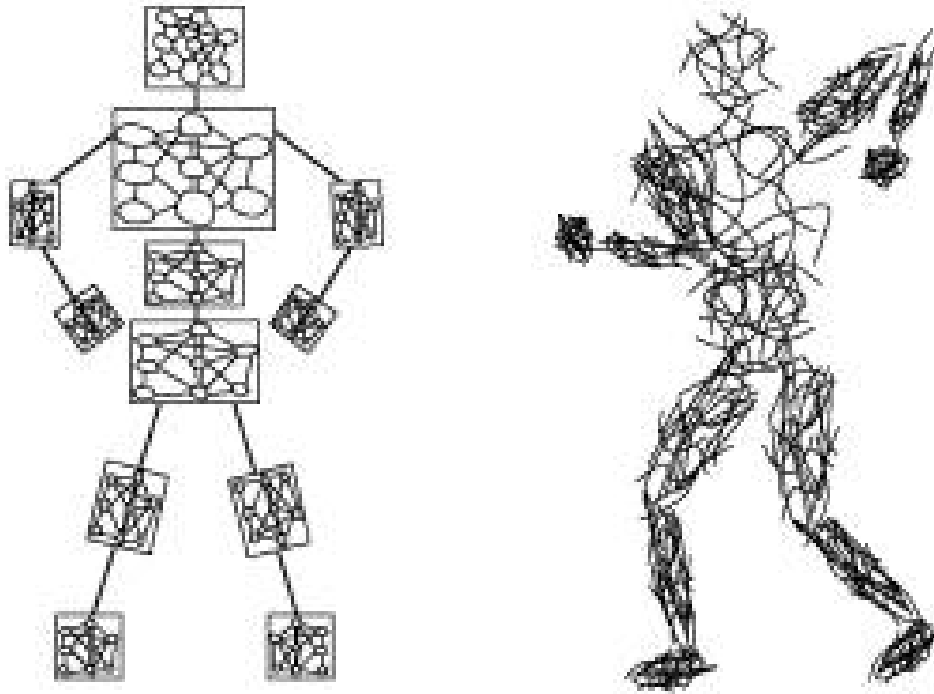
The Learning Refinery

- LD but one element of a larger picture
- Includes Learning Objects, repositories, etc
- "LDs by themselves are of limited value without a bundle of surrounding documentation, metadata, and taxonomies"

Greller http://jime.open.ac.uk/2005/12/

Connectionism

Minsky: Symbolic vs. Analogical Man: Top-Down vs. Bottom Up

http://web.media.mit.edu/~minsky/papers/SymbolicVs.Connectionist.html

Messy vs. Neat

Homogeneous Network

Fixed Learning Procedure

Output

Critics

Input

Uses only one way to learn

Society of Agents

Learn-1   C-Brain   Critic-1

Learn-2   B-Brain

Learn-3   A-Brain   Critic 2

Learn new ways to learn
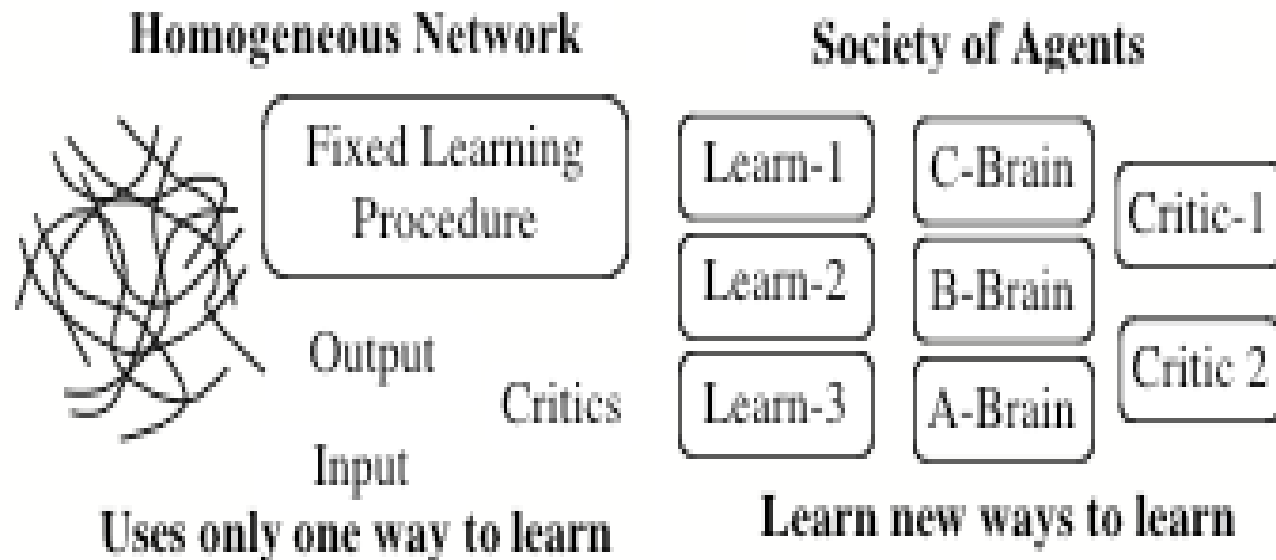
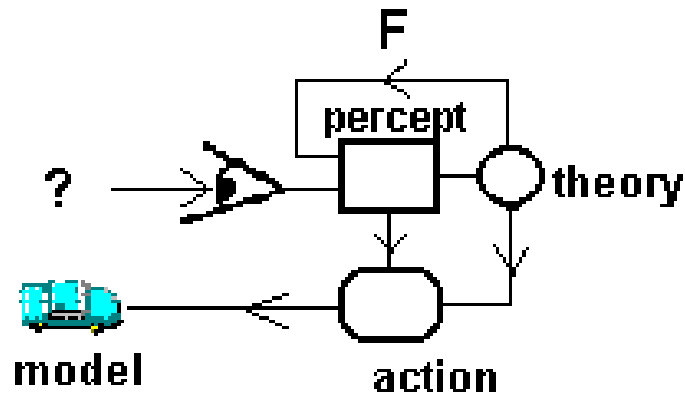Figure. 7: Messy vs. Neat: Homostructural vs. Heterostructural

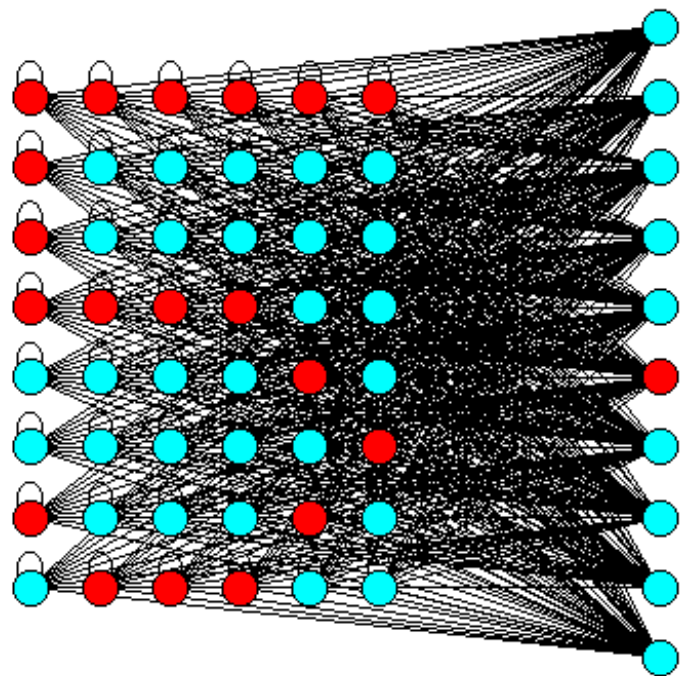# Enter the Network

Figure 8

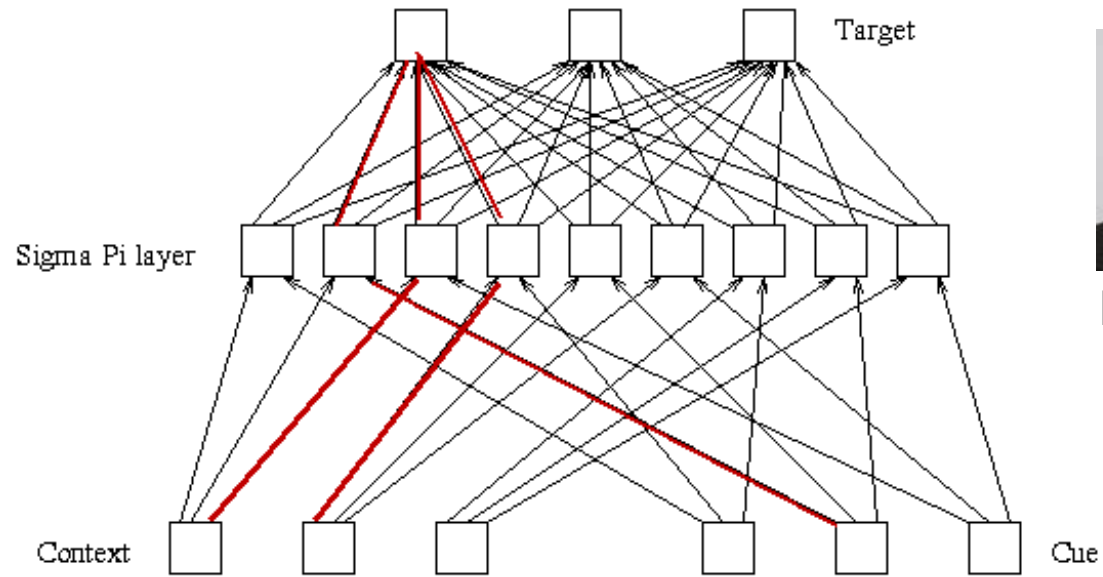Everything is connected

to everything else

(Theory-laden data)

Lakatos

Pattern Recognition…
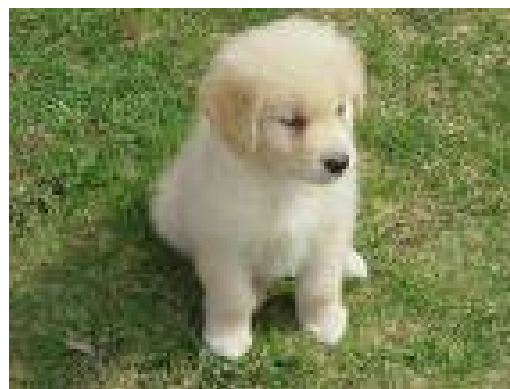
Gibson

stands for?

Target

Sigma Pi layer

Context   Cue
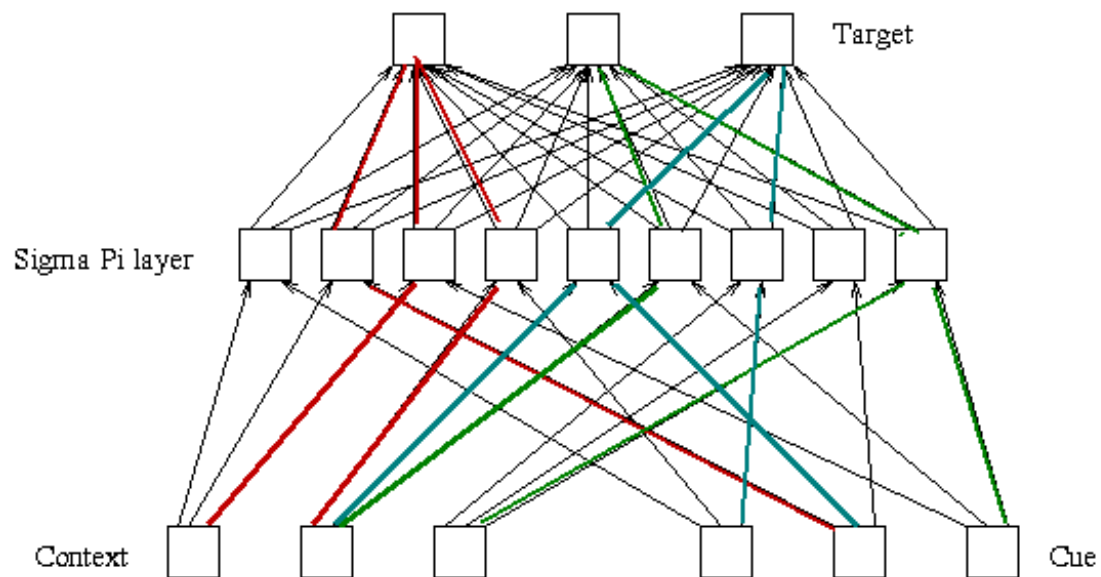
Hopfield

Or is caused by?

Distributed Representation

= a pattern of connectivity

Target

Sigma Pi layer

Context

Cue

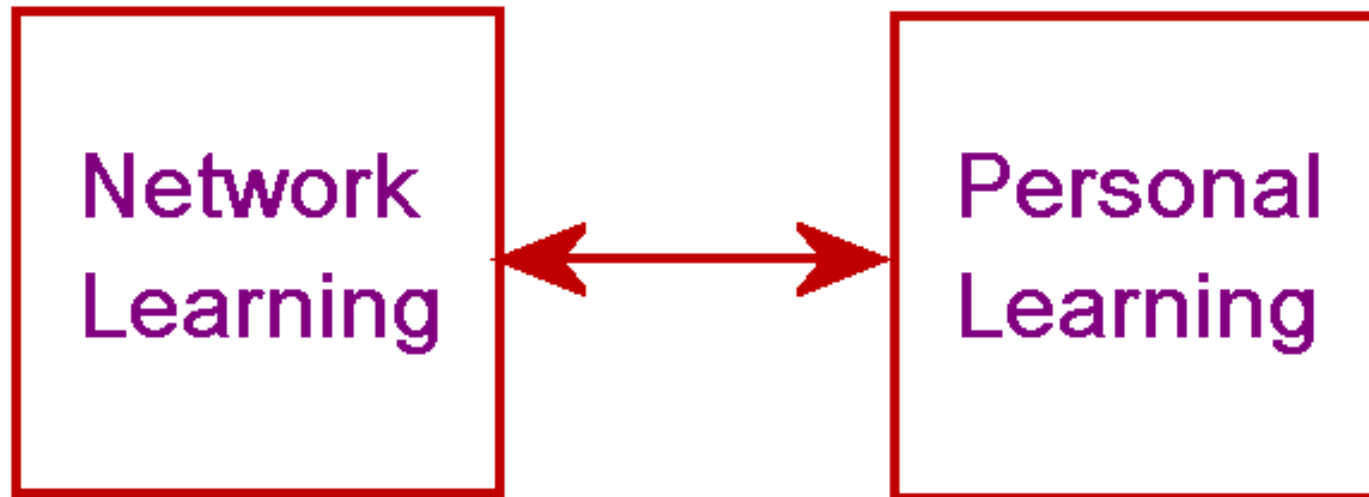BRING BACK THE COUCH
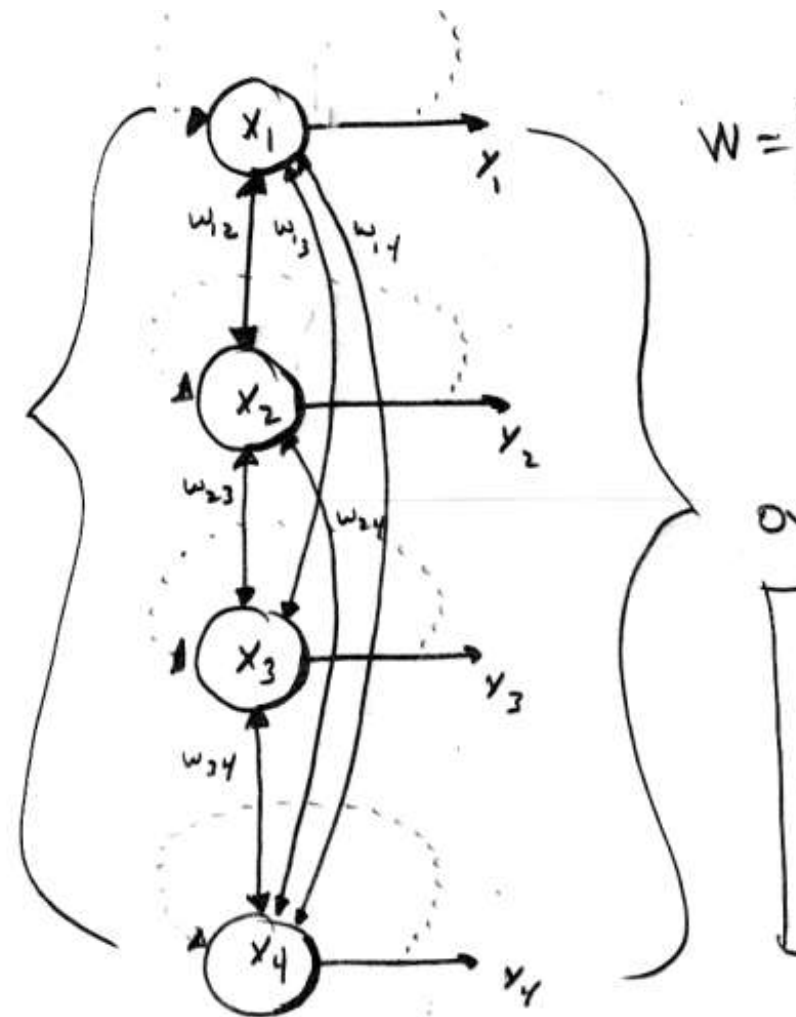
Where is the PLE?
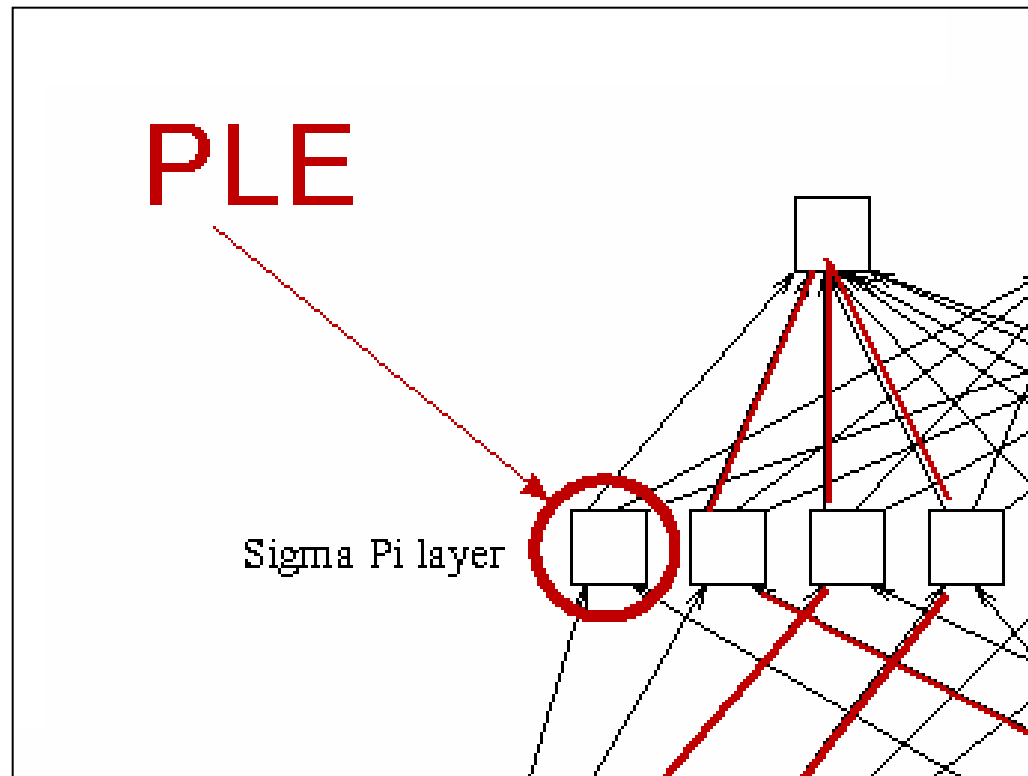
The way networks learn is the way people learn…

This…

Network Learning

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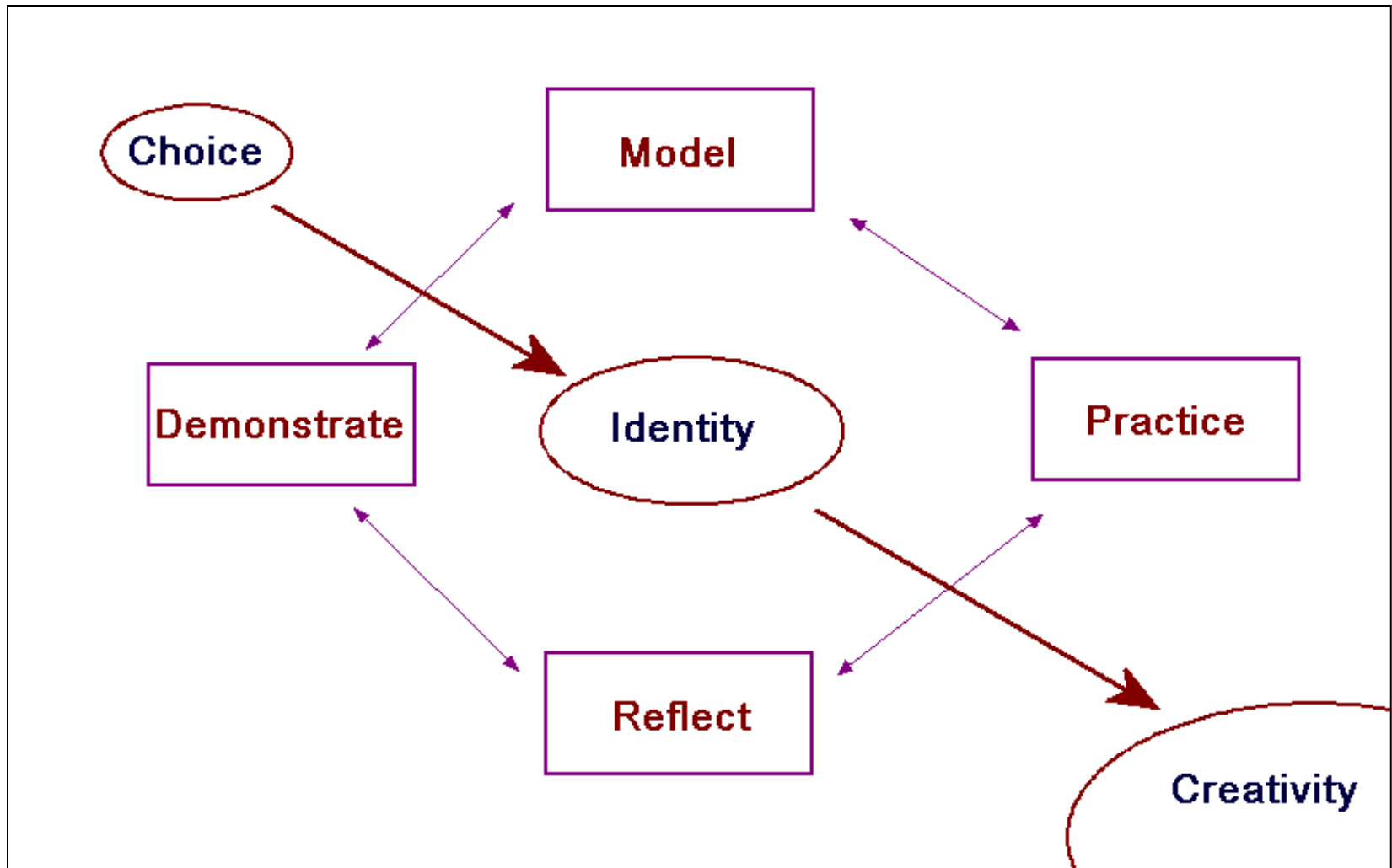 - based on 'settling', annealing

Leads to This…

Personal Learning…

To *teach* is to *model* and to *demonstrate*

To *learn* is to *practice* and *reflect*

What is the PLE?

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

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?

Practice

- supported 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?

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

People talk about 'motivation' – but the real issue here is *ownership*

Choice – Identity - Creativity
- simulated or actual environments that present tasks or problems
- OpenID, authentication, feature or profile development
- Portfolios & creative libraries

http://www.downes.ca

Downes