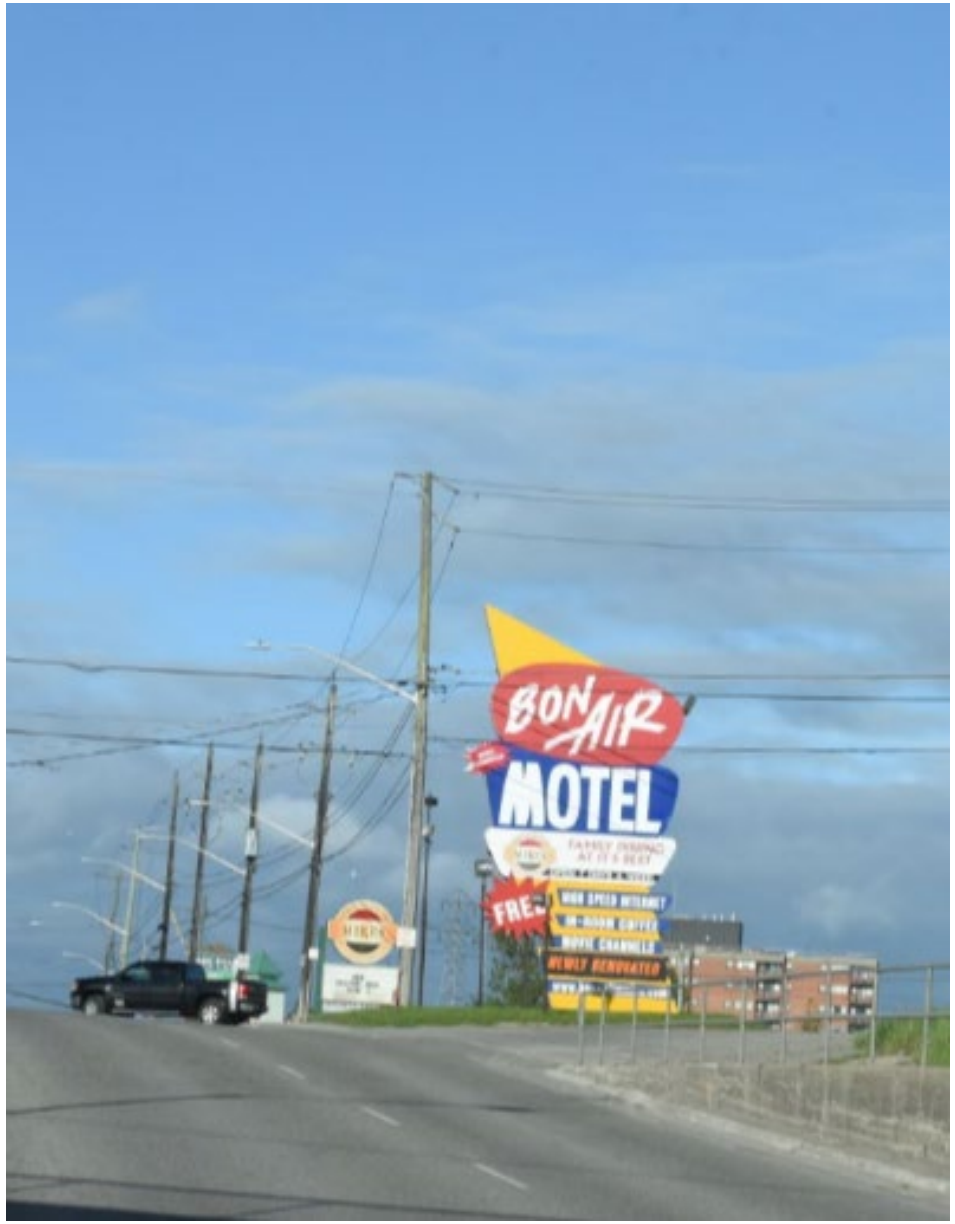
Learning, Doing, and the Golden Ratio

Stephen Downes

June 9, 2016

Kapuskasing, Ontario



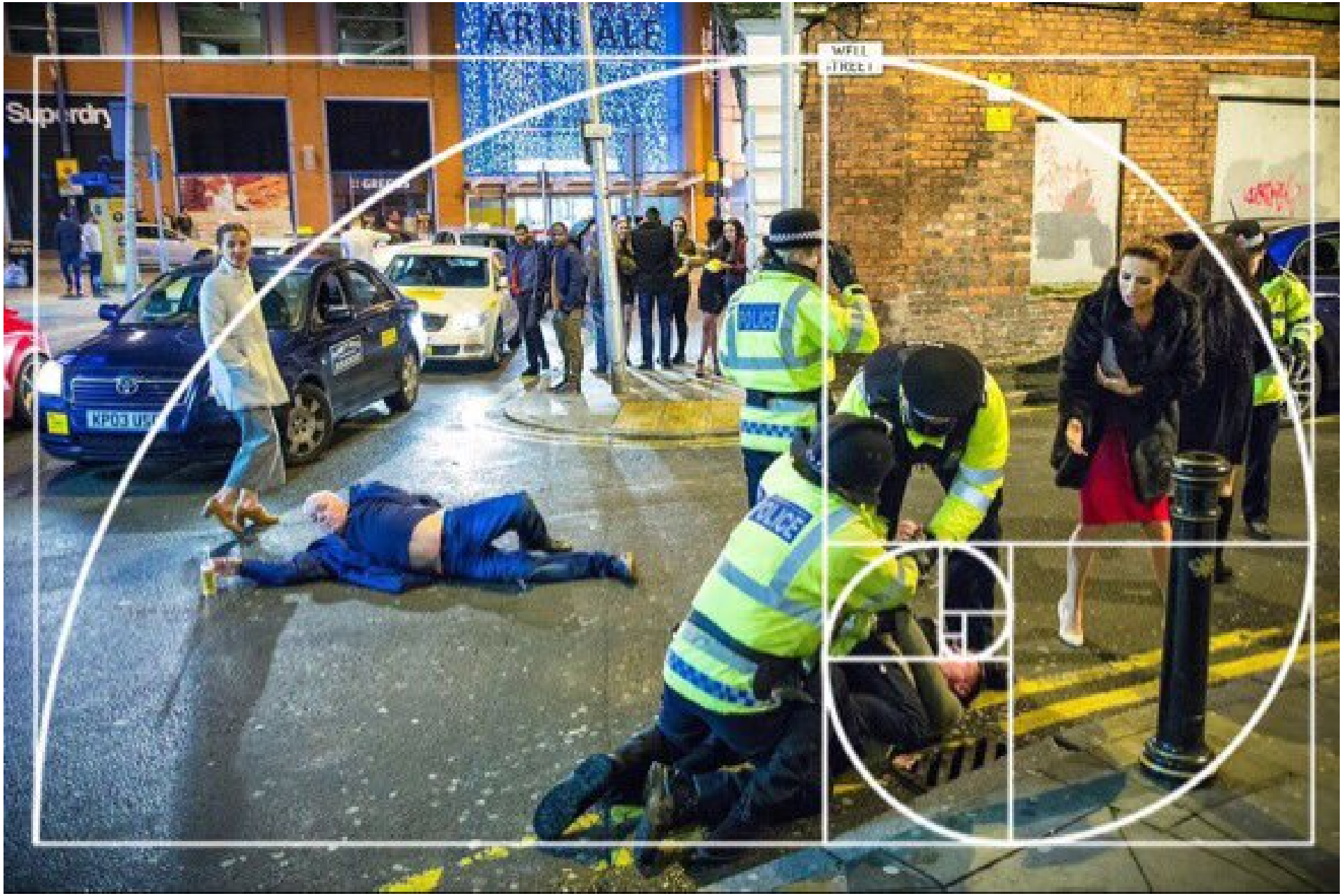
Our objective for today

We will create a 6-sentence essay on the future of learning

https://www.theguardian.com/uk-news/2016/jan/03/like-a-beautiful-painting-image-of-new-years-mayhem-in-manchester-goes-viral

Questions and Topics

- The new roles of professor…
- learning is doing…
- personalized vs personal learning…
- evaluation in the new era…
- the main challenges in education in the 21st century…



https://twitter.com/hughesroland/status/682921993331720196/photo/1?ref_src=twsrc%5Etfw

Seurat

Today’s Imperatives

- critical thinking
- innovation & creativity
- learning to learn
- collaboration
- communication
- global citizenship

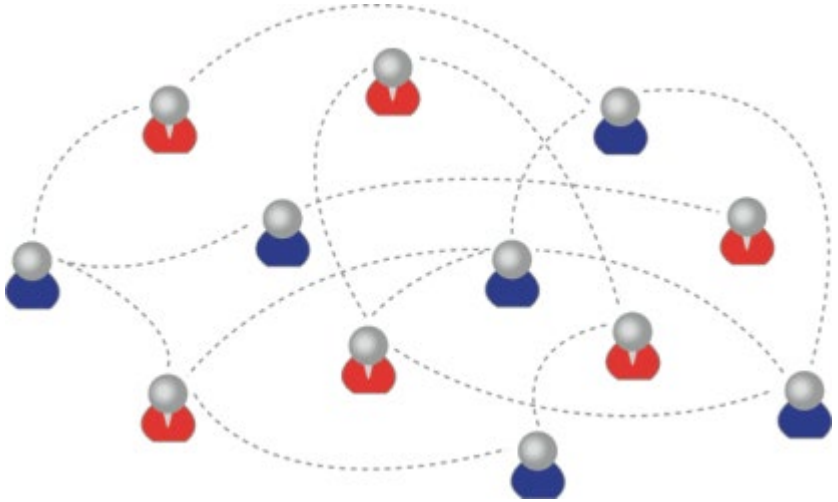
From this morning’s presentation

Design vs Environment

Path	Field
Course	Curriculum (as in ‘mapping’)
Sequence / Prequisite	Core / periphery / foundation
Movement / covered	Inquiry / Discovery / Gaps
Threshold / Levels	Coverage / Construction
Positioning – first / last	Grouping / Clustering
Objective / target	Serendipity / emergence
Leading / Led	Centred

Carrie Paechter, Metaphors of Space in Educational Theory and Practice
http://www.tandfonline.com/doi/pdf/10.1080/1468136040020202

Learning Outcomes



We are using one of these

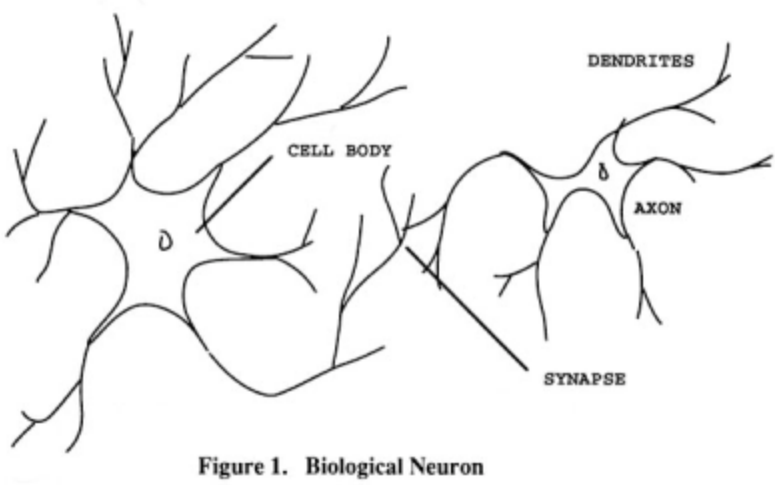


Figure 1. Biological Neuron

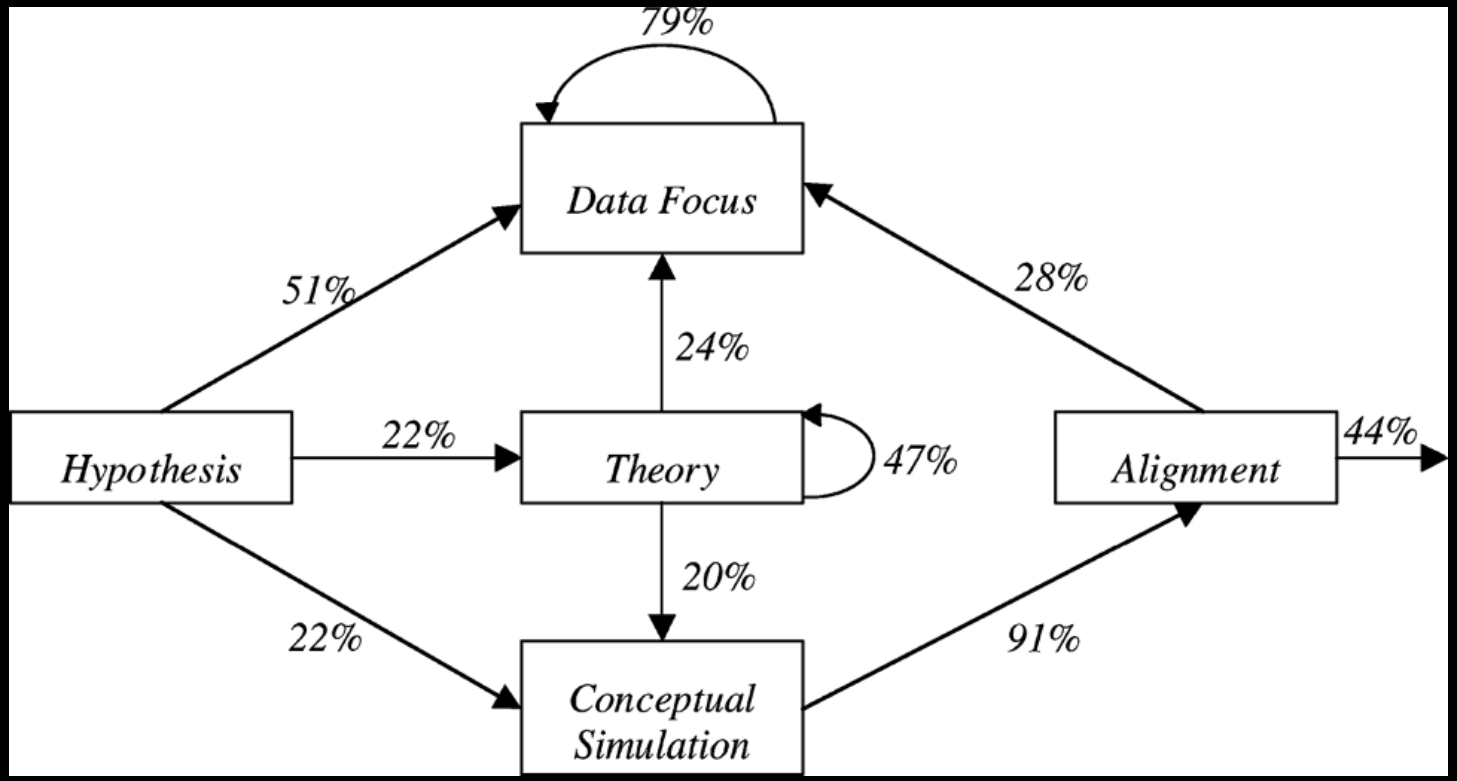
To create one of these

Personal knowledge consists of *neural* connections, not facts and data

Inference and belief

We understand the future in the same way we understand the past, by studying the signs - S. Downes http://www.downes.ca/post/20

Science as language, learning as conversation, knowledge as inference

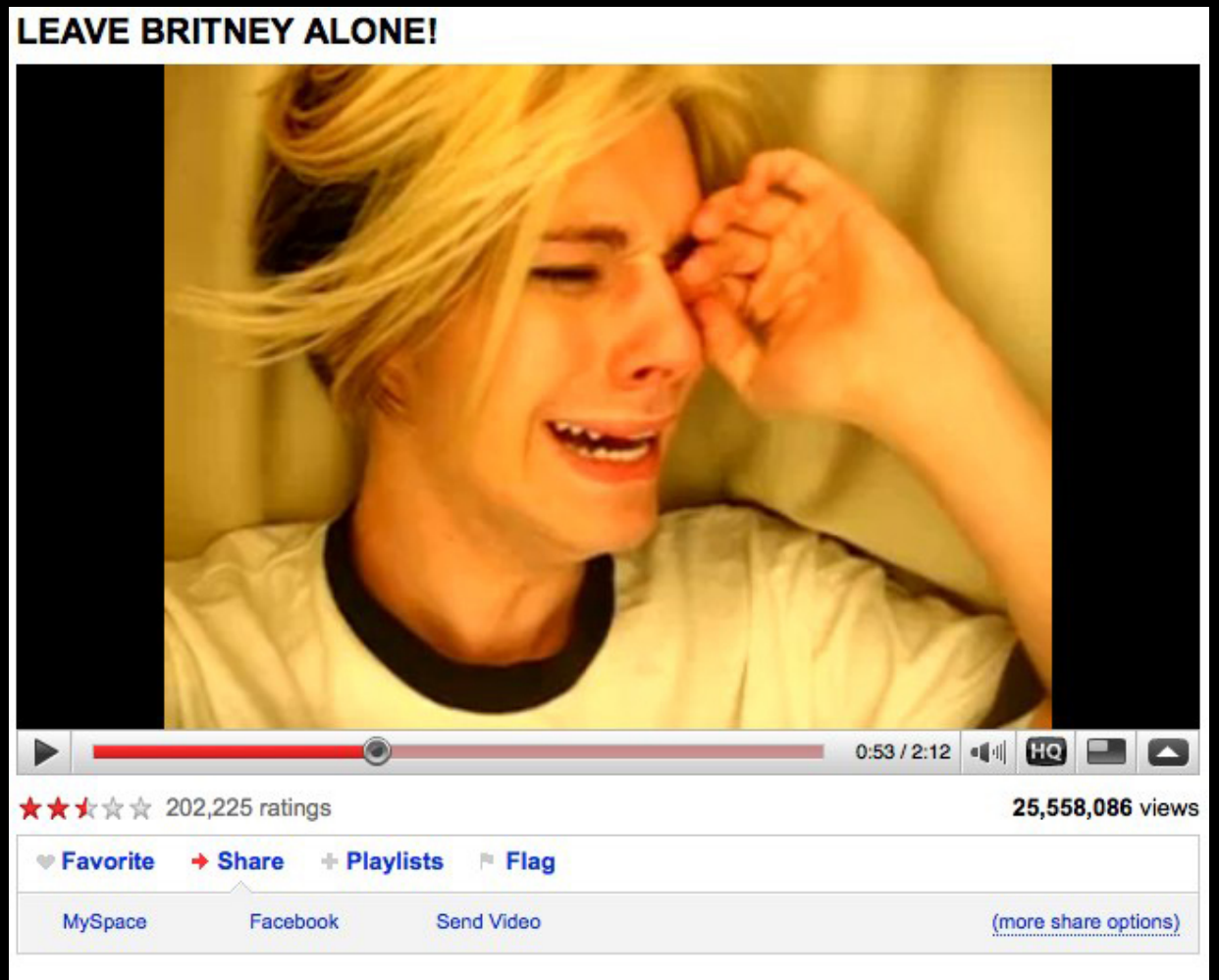


"What if…": The Use of Conceptual Simulations in Scientific Reasoning

http://www.informaworld.com/smpp/1925728116-26233474/ftinterface~db=all~content=a788101161~fulltext=713240928

The Second Thesis, Part B

This means getting beyond narrow text-based conceptions we have of media



Conceptions Like:

- messages have a sender and a receiver
- words get meaning from what they represent
- truth is based on the real world
- events have a cause, and causes can be known
- science is based on forming and testing hypotheses

These, taken together, constitute, a static, linear, coherent picture of the world

The world, as though it were a book, or a library

Not everyone sees it that way

A frame for understanding new media

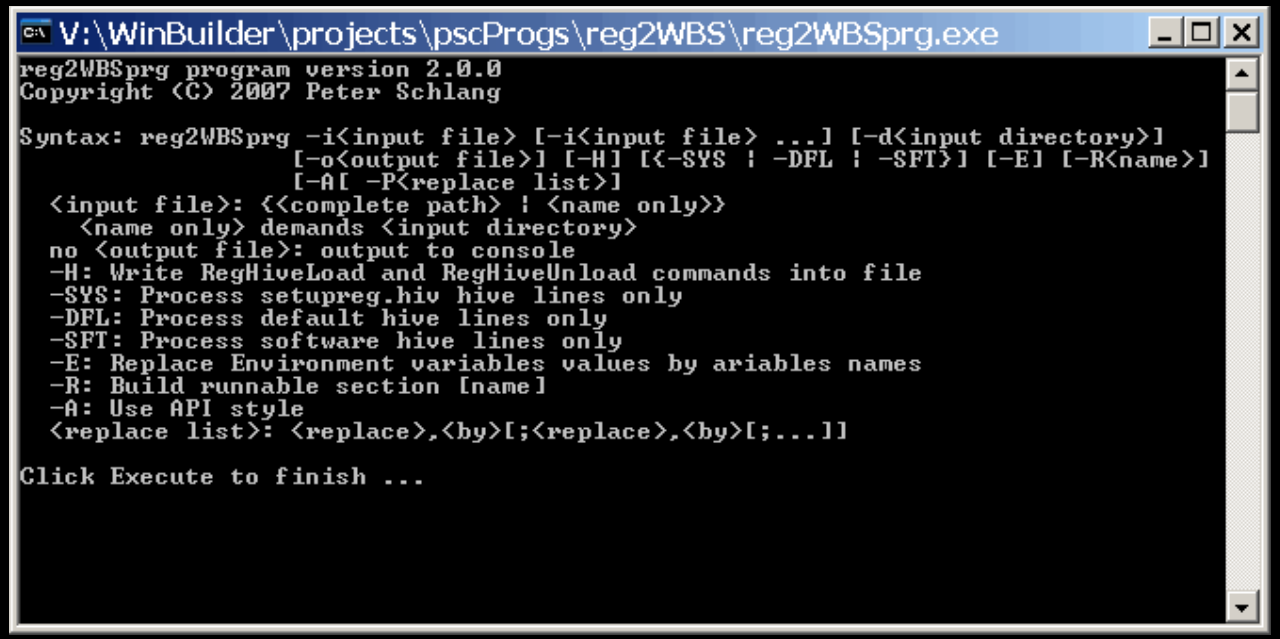
Morris, Derrida and a little Lao Tzu

Syntax	Cognition
Semantics	Context
Pragmatics	Change

We need this frame because (as Jukes said) if we aren't looking for these things, we just won't see them.

Syntax

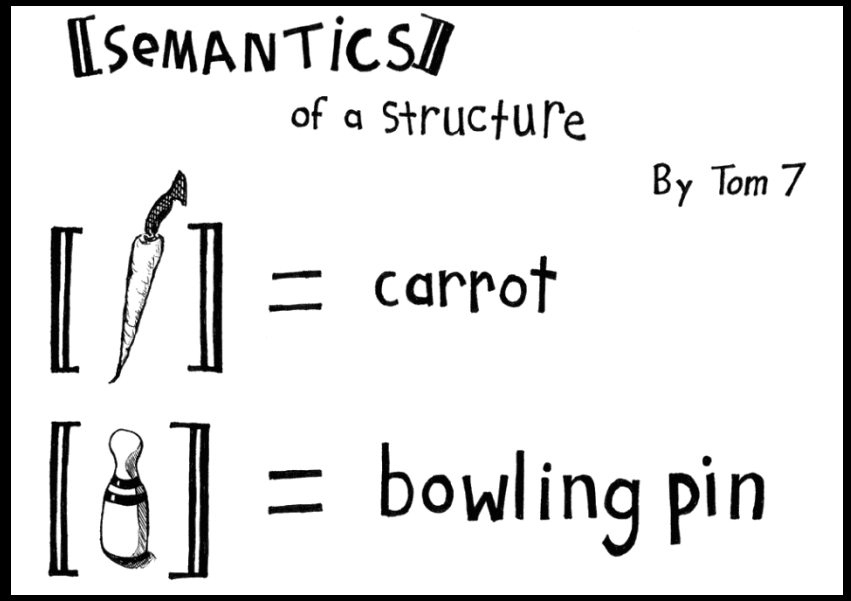
Not just rules and grammar



Forms: archetypes? Platonic ideals?
Rules: grammar = logical syntax
Operations: procedures, motor skills
Patterns: regularities, substitutivity (eggcorns, tropes)
Similarities: Tversky - properties, etc

Semantics

theories of truth / meaning / purpose / goal



http://www.cs.cmu.edu/~tom7/csnotes/fall02/semantics.gif

- Sense and reference (connotation and denotation)
- Interpretation (Eg. In probability, Carnap - logical space; Reichenbach - frequency; Ramsey - wagering / strength of belief)
- Forms of association: Hebbian, contiguity, back-prop, Boltzmann
- Decisions and decision theory: voting / consensus / emergence

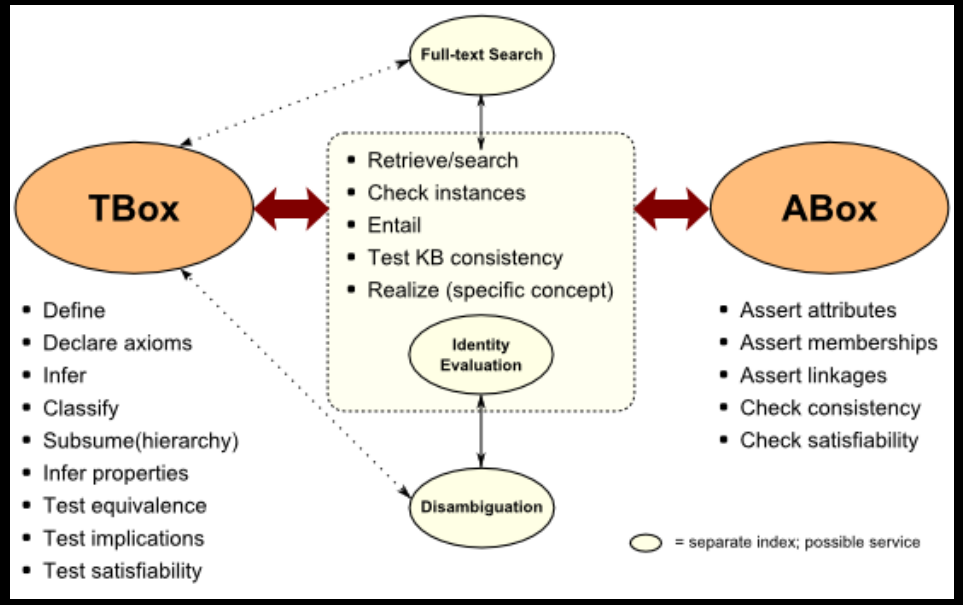
Pragmatics

use, actions, impact

- Speech acts (J.L. Austin, Searle) assertives, directives, commissives, expressives, declarations (but also - harmful acts, harassment, etc)
- Interrogation (Heidegger) and presupposition
- Meaning (Wittgenstein - meaning is use)

Cognition

reasoning, inference and explanation



http://www.mkbergman.com/category/description-logics/

- description - X (definite description, allegory, metaphor)
- definition - X is Y (ostensive, lexical, logical (necess. & suff conds), family resemblance - but also, identity, personal identity, etc
- argument - X therefore Y - inductive, deductive, abductive (but also: modal, probability (Bayesian), deontic (obligations), doxastic (belief), etc.)
- explanation - X because of Y (causal, statistical, chaotic/emergent)

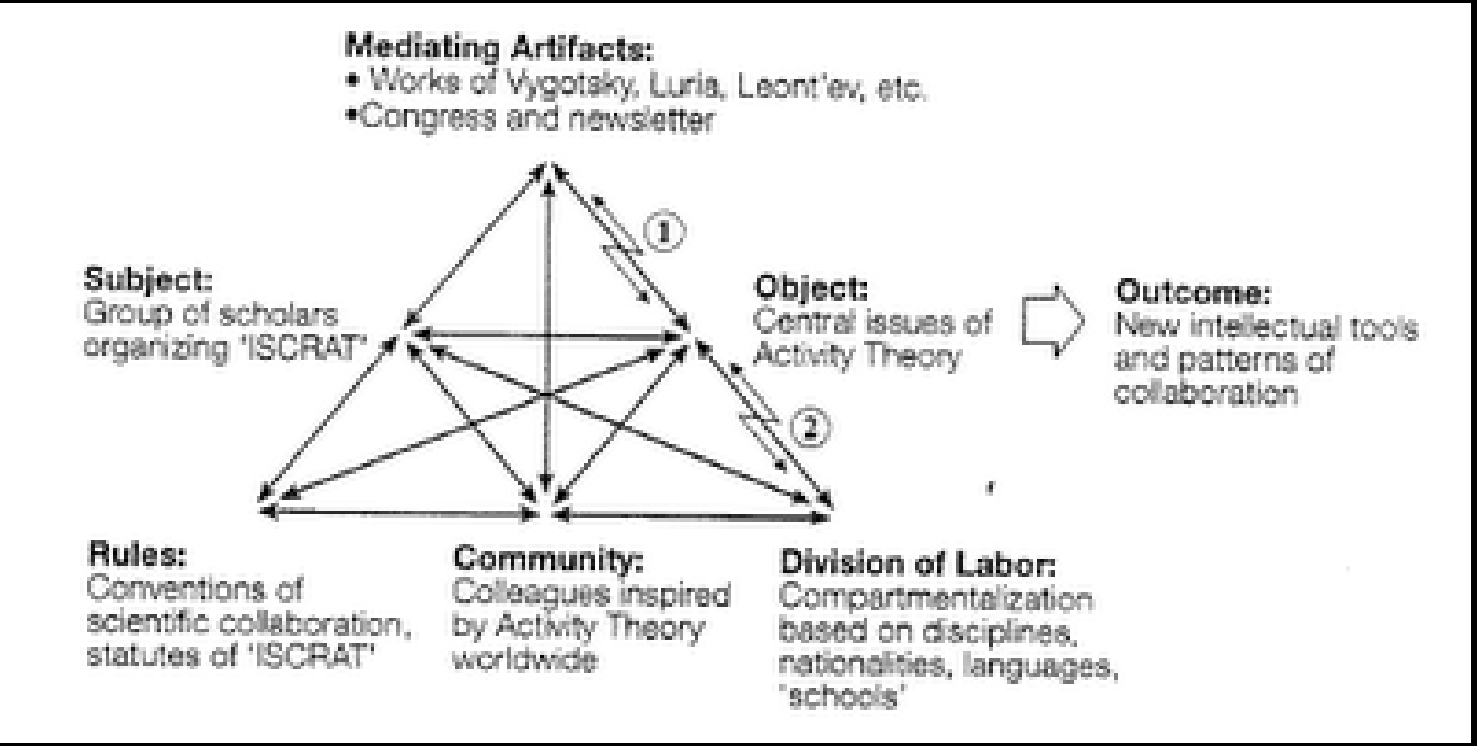
Context

placement, environment

http://www.occasionbasedmarketing.com/what-it-is

- explanation (Hanson, van Fraassen, Heidegger)
- meaning (Quine); tense - range of possibilities
- vocabulary (Derrida); ontologies, logical space
- Frames (Lakoff) and worldviews

Change



- relation and connection: I Ching, logical relation
- flow: Hegel - historicity, directionality; McLuhan - 4 things
- progression / logic -- games, for example: quiz&points, branch-and-tree, database
- scheduling - timetabling - events; activity theory / LaaN

21st Century ~~Skills~~ Languages

http://spotlight.macfound.org/btr/entry/new_media_literacies/

The ‘skills’ described by Jenkins – *performance, simulation, appropriation, etc* - are actually *languages* and should be understood in terms of these six dimensions

21st Century Languages

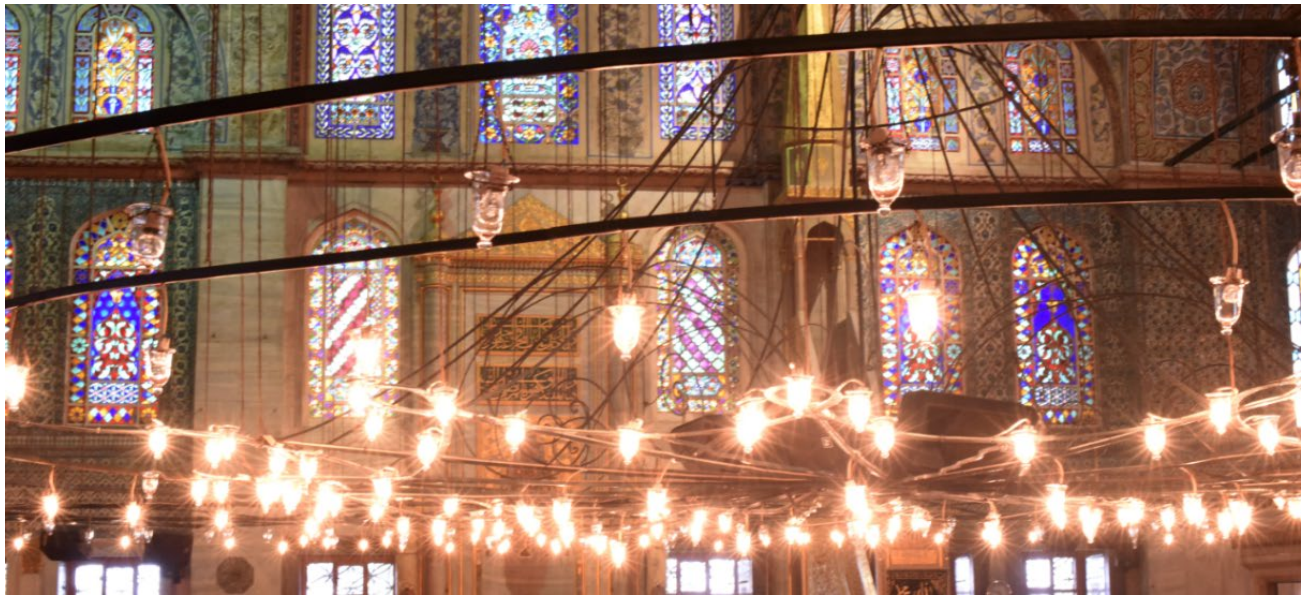
Languages / Elements	Performance	Simulation	Appropriation
Syntax			
Semantics			
Pragmatics			
Cognition			
Context			
Change			

Example: Performance - Syntax

Languages / Elements	**Performance** (the ability to adopt alternative identities for the purpose of improvisation and discovery) **(subcategories?)**
Syntax: - Forms - Rules - Operations - Patterns - Similarities	- Presentation acting, method acting - "Know your lines" etc http://filmtvcareers.about.com/od/gettingthejob/a/GJ_Actor_Tips.htm - Stanislavski's system (etc…) http://en.wikipedia.org/wiki/Stanislavski%27s_system - Ritual Performance (etc.) http://www.let.rug.nl/koster/papers/JHP.Koster2.Edit.pdf - Comparing Tales (etc.) http://artsedge.kennedy-center.org/content/2343/

The Inflexible Law of Learning

It's when we do stuff that we learn, not when stuff does something for us.



- 6 groups
- One for each critical literacy

The Future in 2016

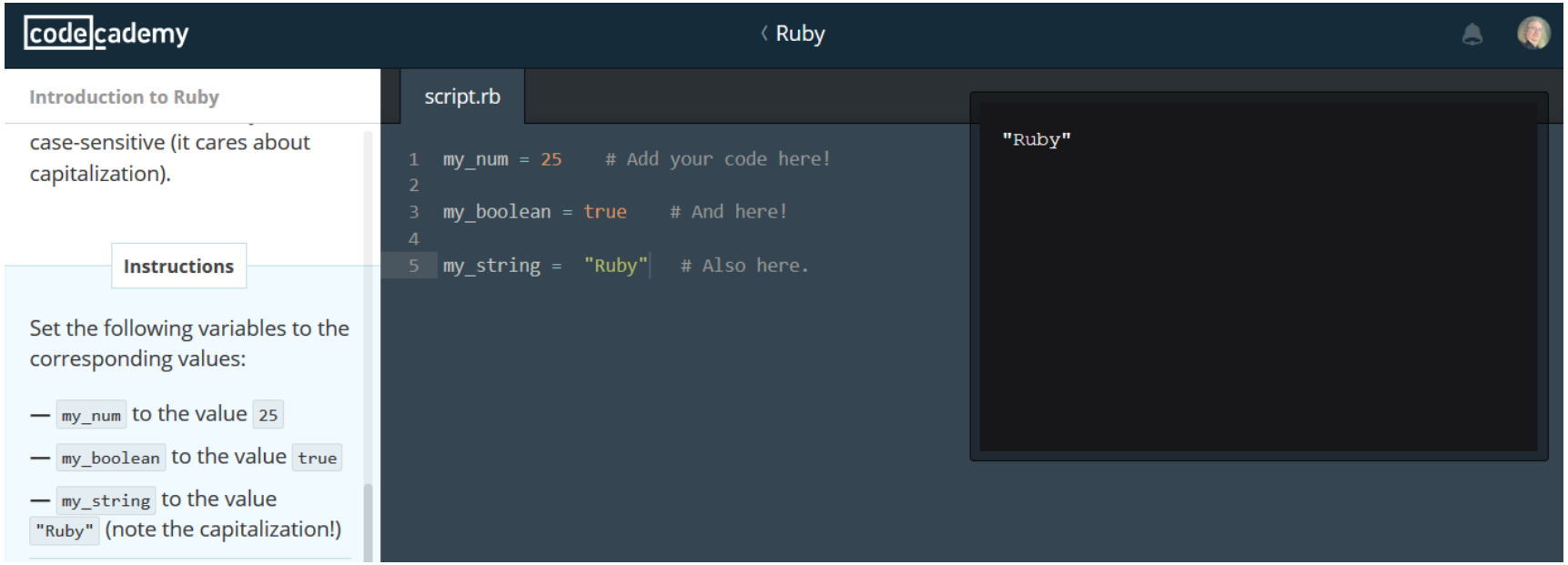
1. Machine learning and artificial intelligence
2. Handheld and Mobile Computing
3. Outcomes and Competencies
4. Internet of Things
5. Games, Sims and Virtual Reality
6. Translation and Collaborative Technology

http://teachonline.ca/tools-trends/exploring-future-education/2016-look-future-online-learning-part-1

http://halfanhour.blogspot.com.tr/2016/03/the-2016-look-at-future-of-online.html

1. Machine learning and AI

- Not simply for adaptive learning
- The idea is to create an *environment*



https://www.codecademy.com/

Three Types of AI

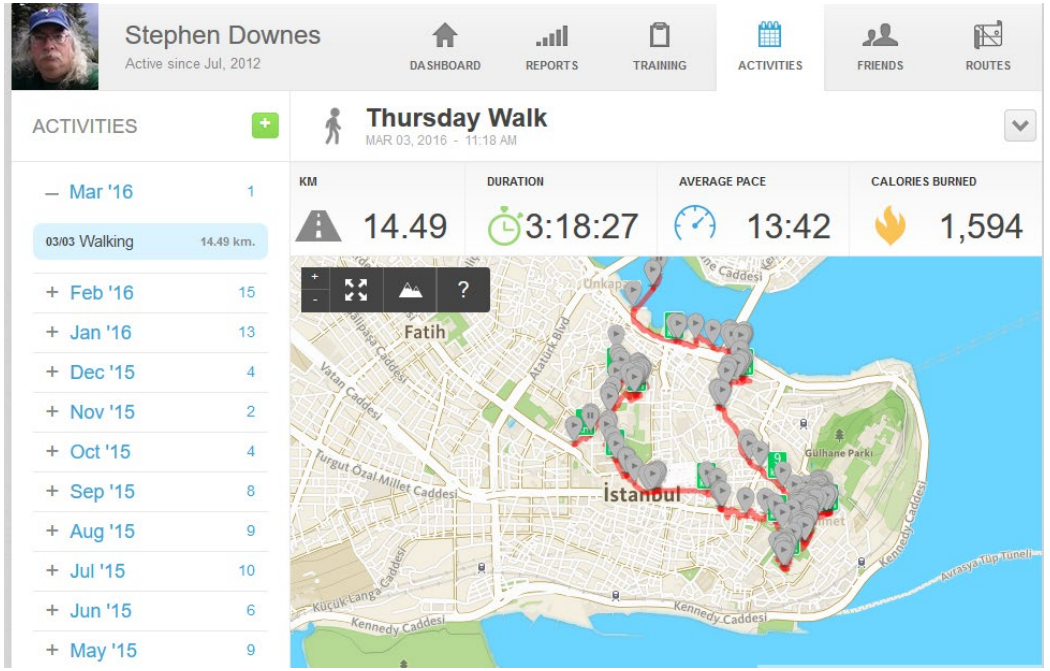
- **decision engines** - these are expert systems that are based on rule-driven strategies
- **pattern recognition** - perceptual systems that identify patterns from partial or disorganized data
- **cluster detection** - detecting nearest neighbours and categories of things

http://www.wtec.org/loyola/kb/c1_s1.htm

http://research.microsoft.com/en-us/um/people/cmbishop/prml/

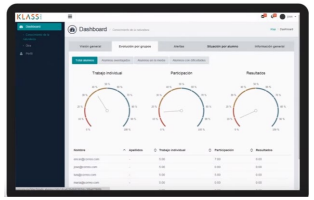
Learning Analytics

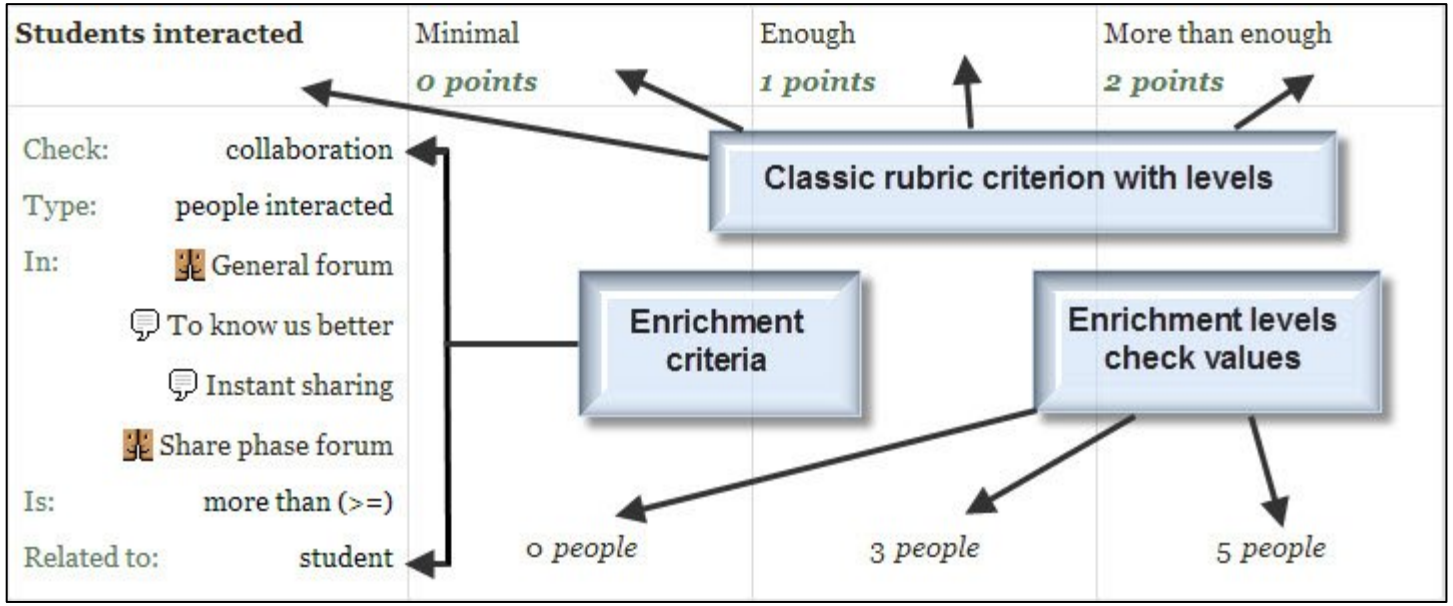
- We talk about predictive analytics as though finishing a course is the problem
- The real future is in the quantified self



http://quantifiedself.com/

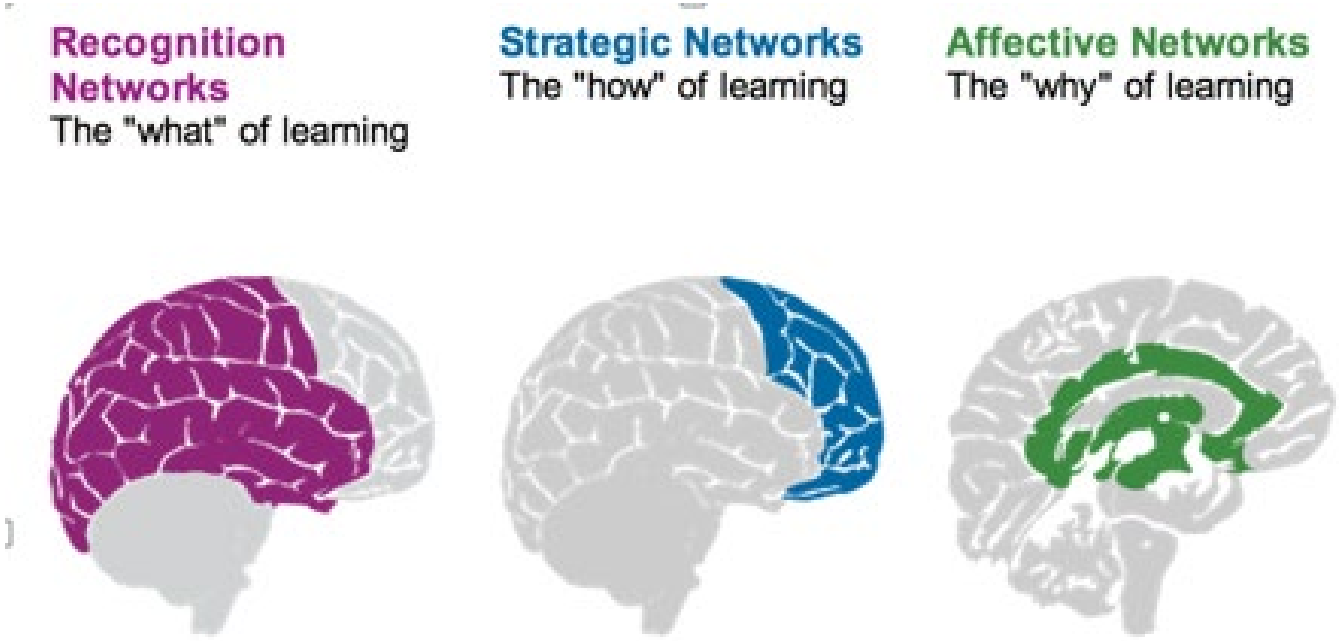
- Predictive Analytics
- Recognition Tasks



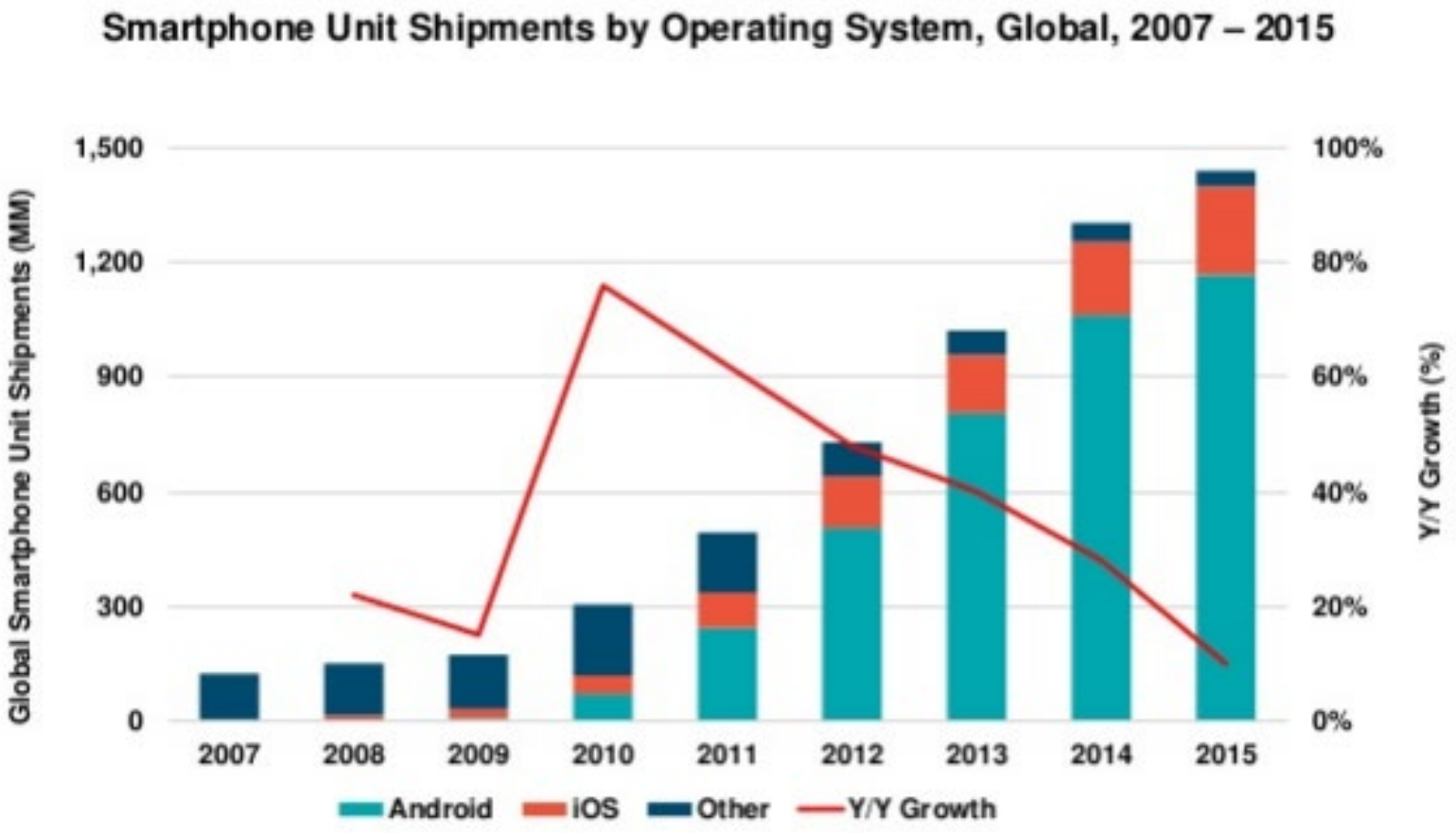


Personalized Learning

- Rules-Based Events (like notifications)
- User Models
- Adaptive Learning



2. Handheld and Mobile Computing



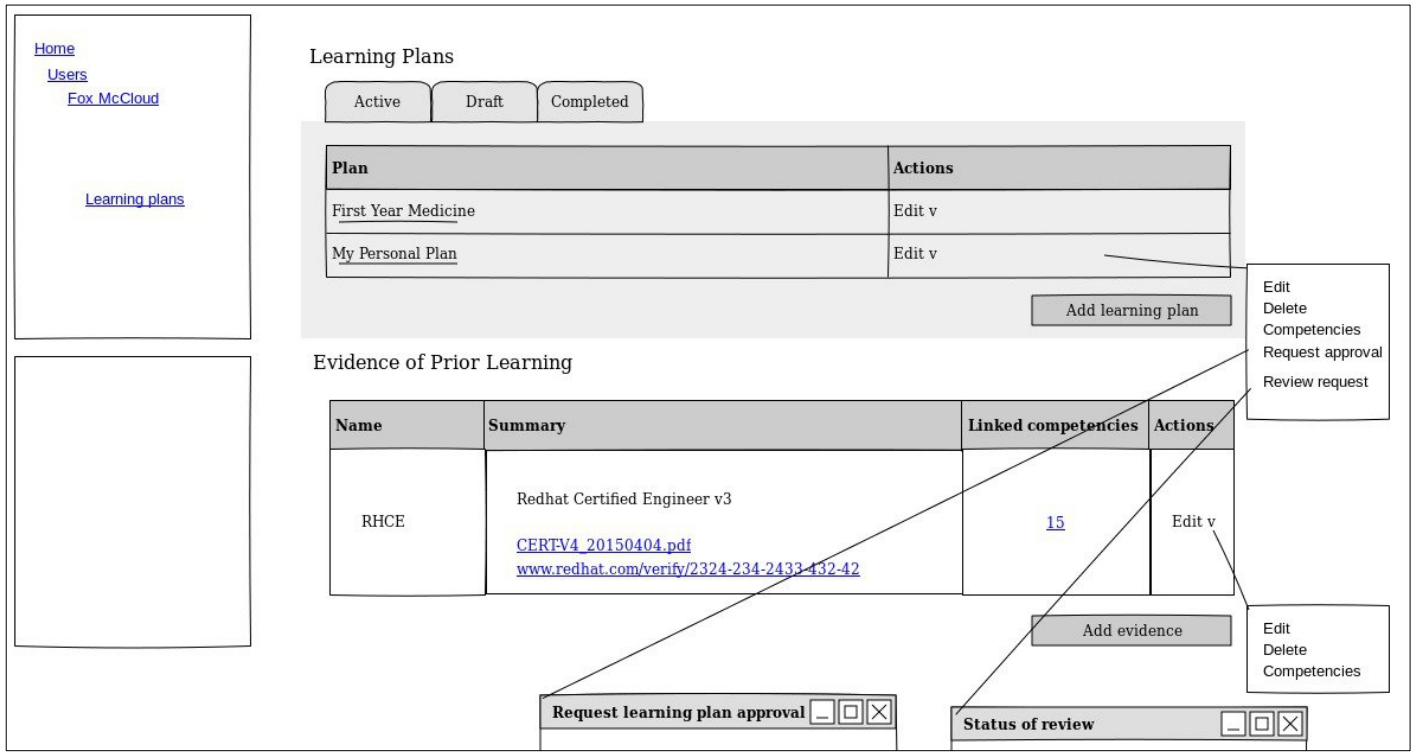
Mary Meeker http://www.slideshare.net/kleinerperkins/2016-internet-trends-report?ref=http://www.kpcb.com/internet-trends

Performance Support

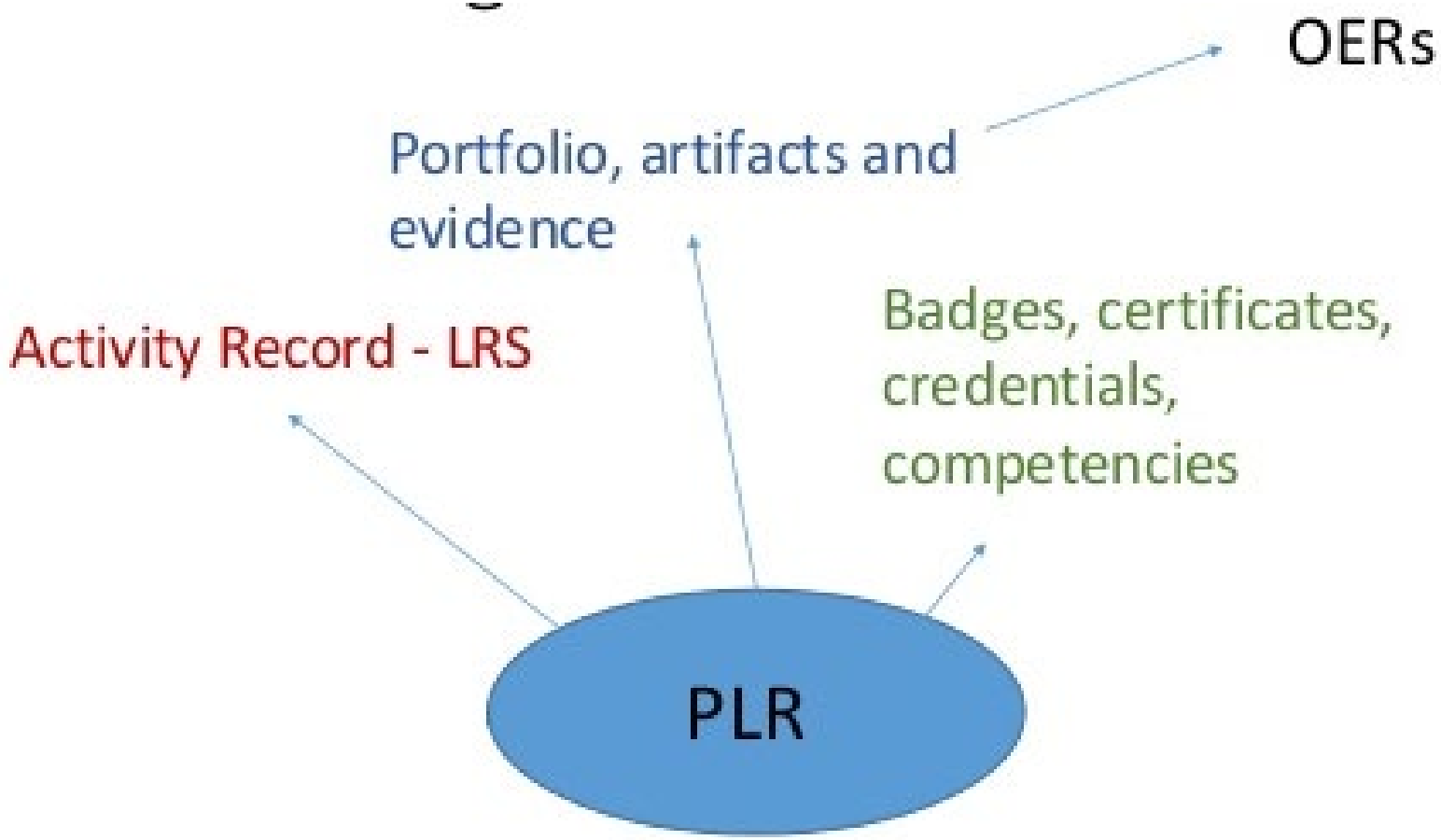
- The future of learning isn't the mobile phone
- It's in the *integrated* performance support system

http://fortune.com/2014/05/27/a-tennis-racquet-that-isnt-just-strung-but-wired/

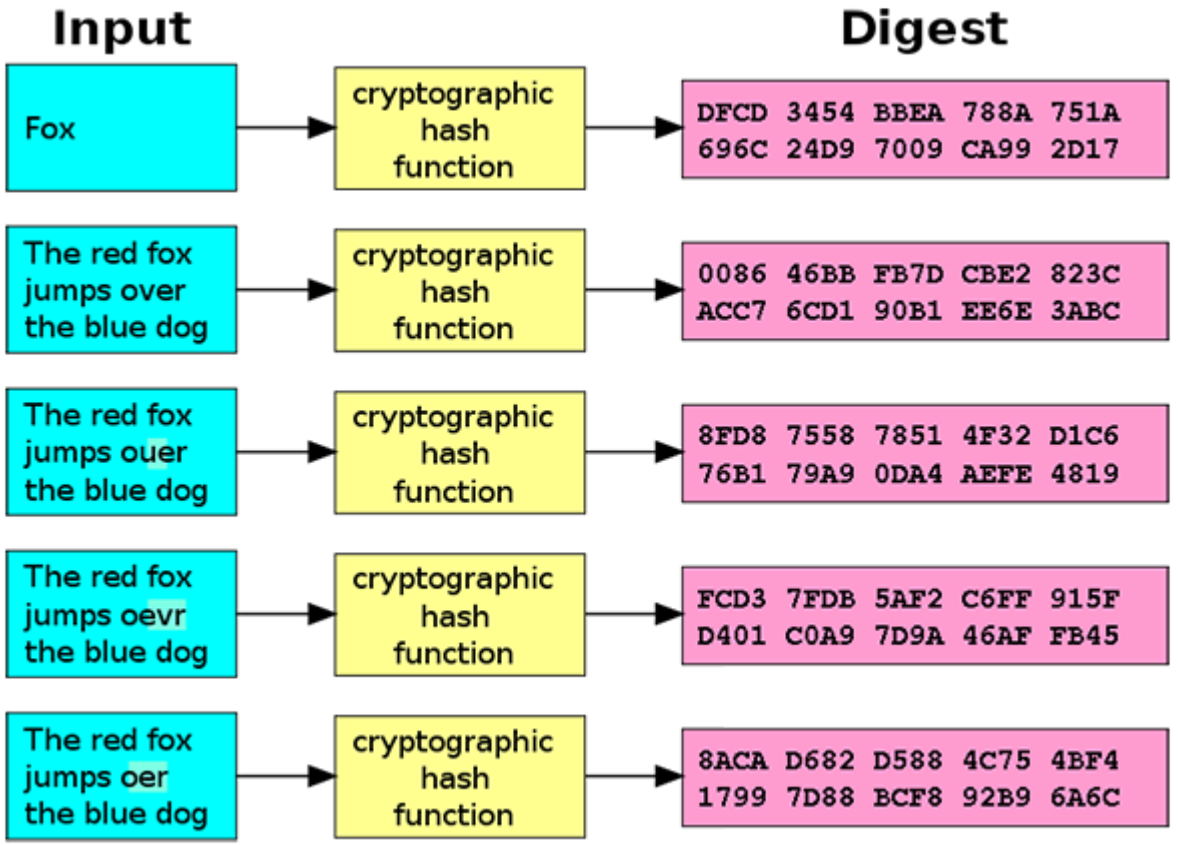
3. Outcomes and Competencies



Personal Learning Records



Badges and Blockchain



http://dmlcentral.net/blog/doug-belshaw/peering-deep-future-educational-credentialing

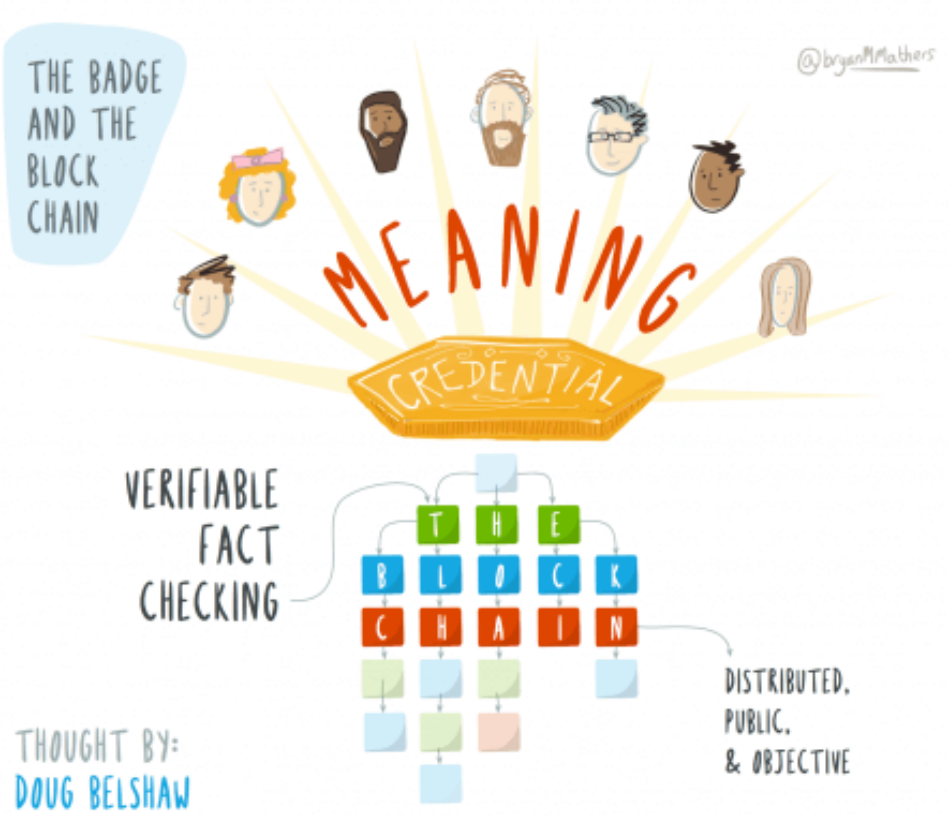
http://www.downes.ca/search/blockchain

Doug Belshaw:

"If we used the blockchain for Open Badges," he writes, "then we could prove beyond reasonable doubt that the person receiving badge Y is the same person who created evidence X.

Credentials

Sony plans to launch a testing platform powered by blockchain and that IBM plans to offer 'blockchain-as-a-service,'"

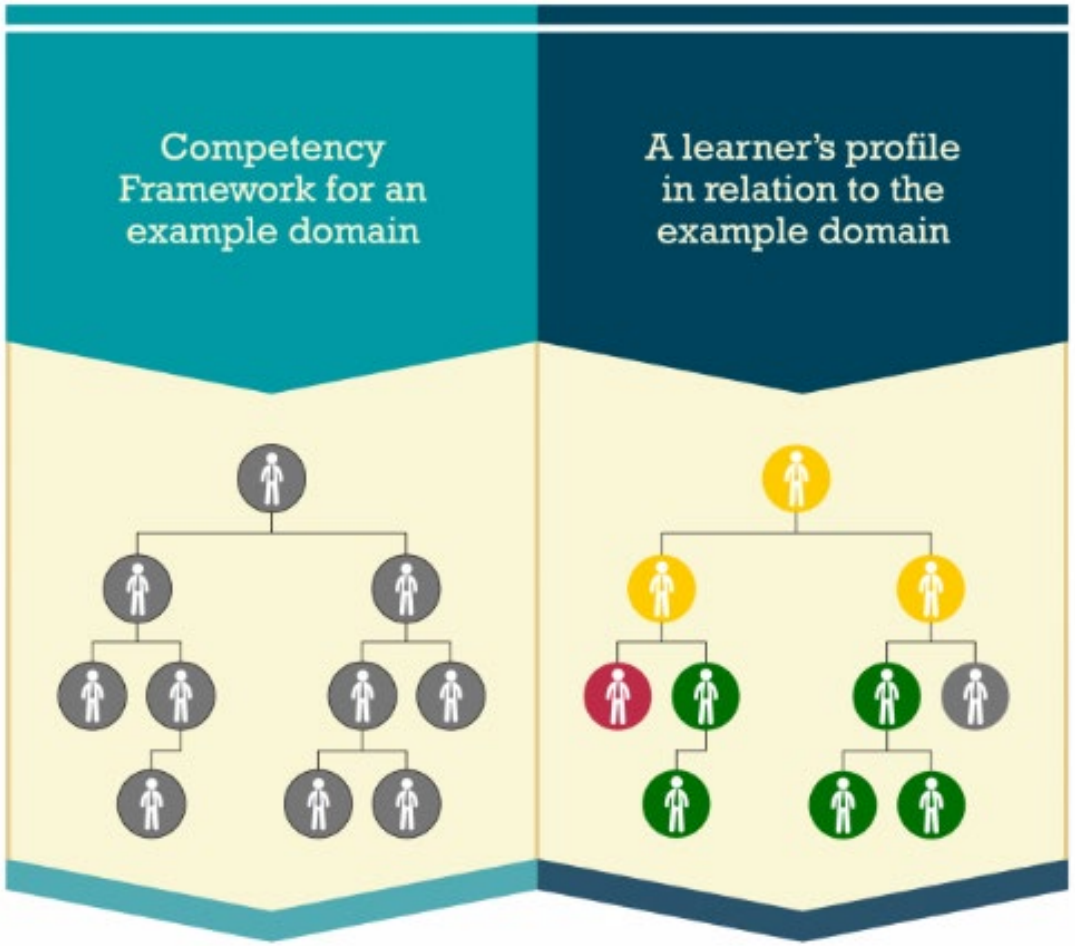


Audrey Watters
http://hackeducation.com/2016/02/25/blockchain-edu1

The Dao

- Ethereum is a decentralized platform that runs smart contracts https://www.ethereum.org/
- The Dao is a 'distributed corporation' that receives investments, chooses projects, and pays for their development; some of these projects return revenue to Dao and others don't. https://magazine.backfeed.cc/dao-alive-now-let-evolution-begin/

CASS



Competency and Skills System

https://www.adlnet.gov/introducing-the-next-big-thing-cass/

4. Internet of Things

What happens when companies know the state of all your devices?

http://www.cbc.ca/news/canada/car-tracking-devices-spark-privacy-concerns-1.1366687

5. Games, Sims and Virtual Reality

‘Gamification’ – adds game elements to learning

‘Serious Games’ – employs a game to facilitate learning

https://badgeville.com/wiki/Gamification

Oculus Rift

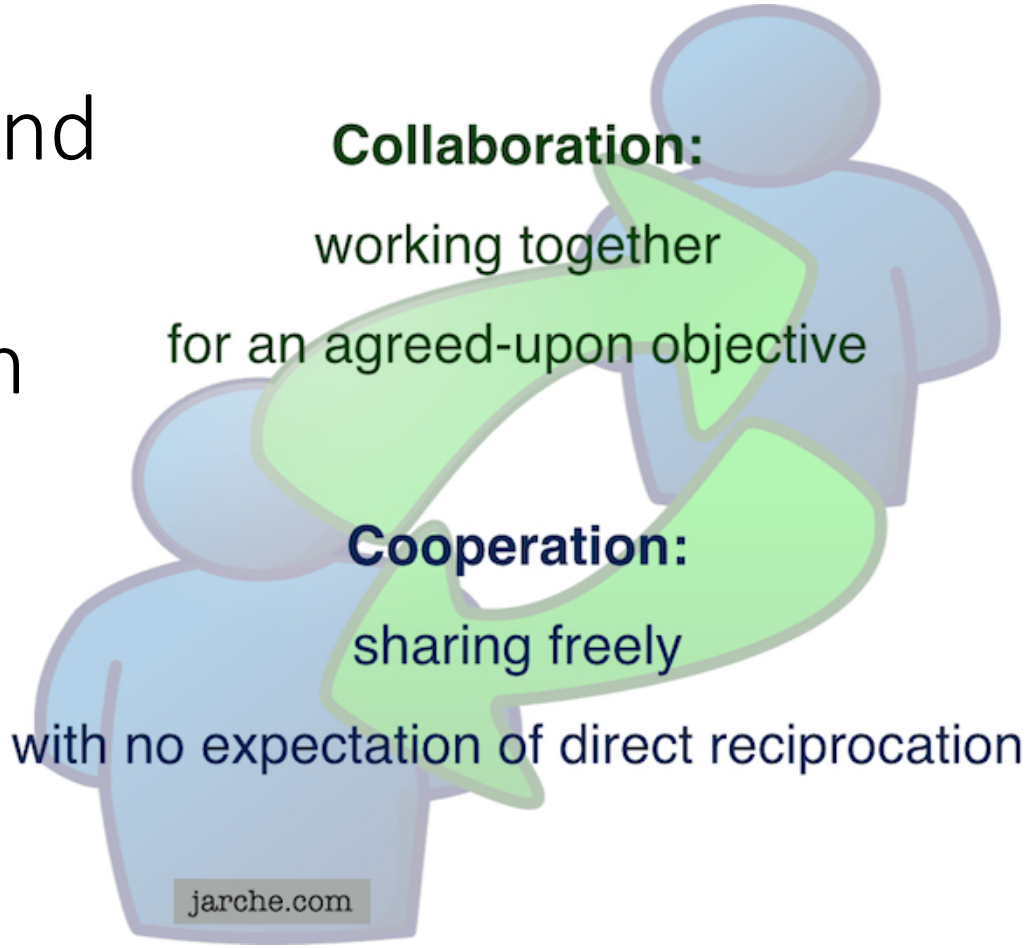
1. Freezers
2. Smilers
3. Grippers
4. Swayers
5. Screamers
6. Freak-outs

http://donaldclarkplanb.blogspot.ca/2014/11/oculus-rift-freezers-smilers-grippers.html

http://www.downes.ca/search/oculus

6. Translation and Collaborative Technology

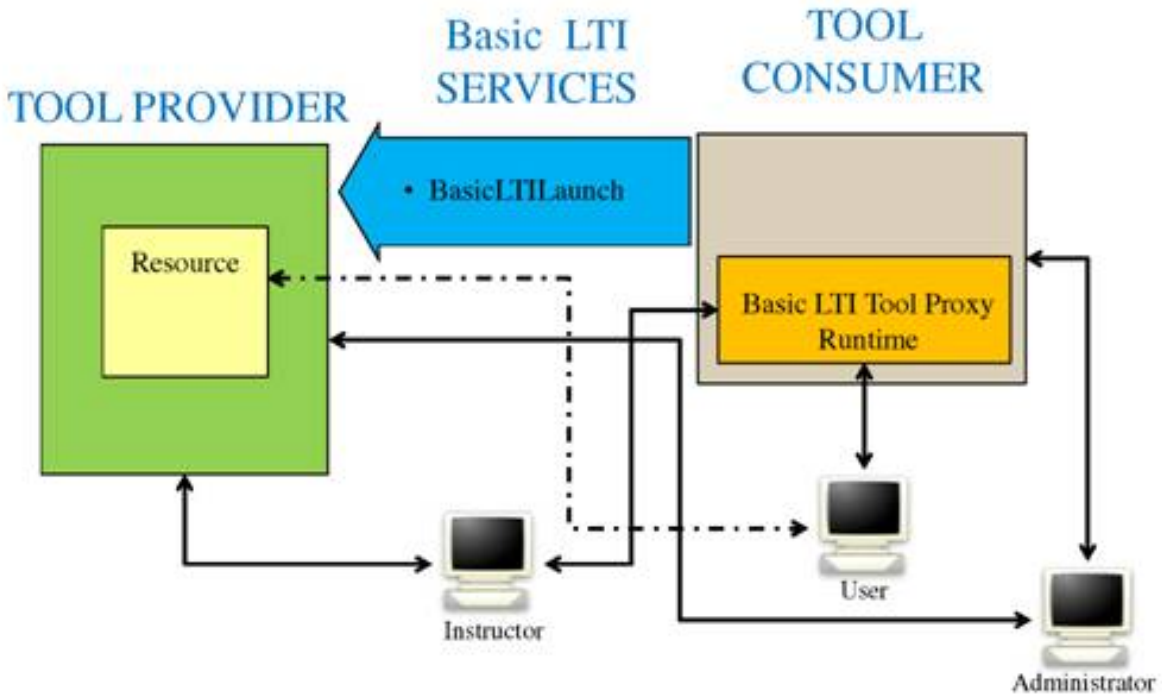
- Communication is and will be everywhere
- But the future lies in cooperation, not collaboration



https://cyber.law.harvard.edu/research/cooperation
Image: http://Jarche.com

Learning Tools

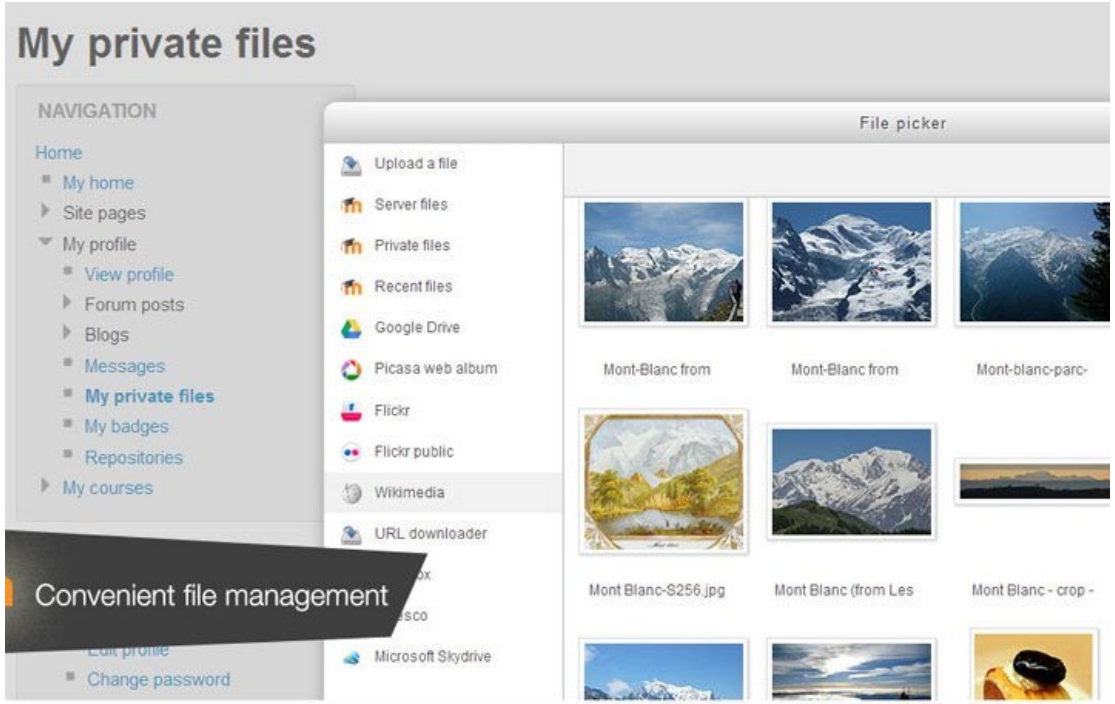
- LTI Producer – provides features
- LTI Consumer – connects to features



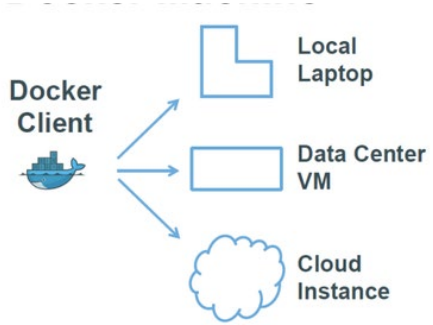
https://www.imsglobal.org/specs/ltiv1p0/implementation-guide

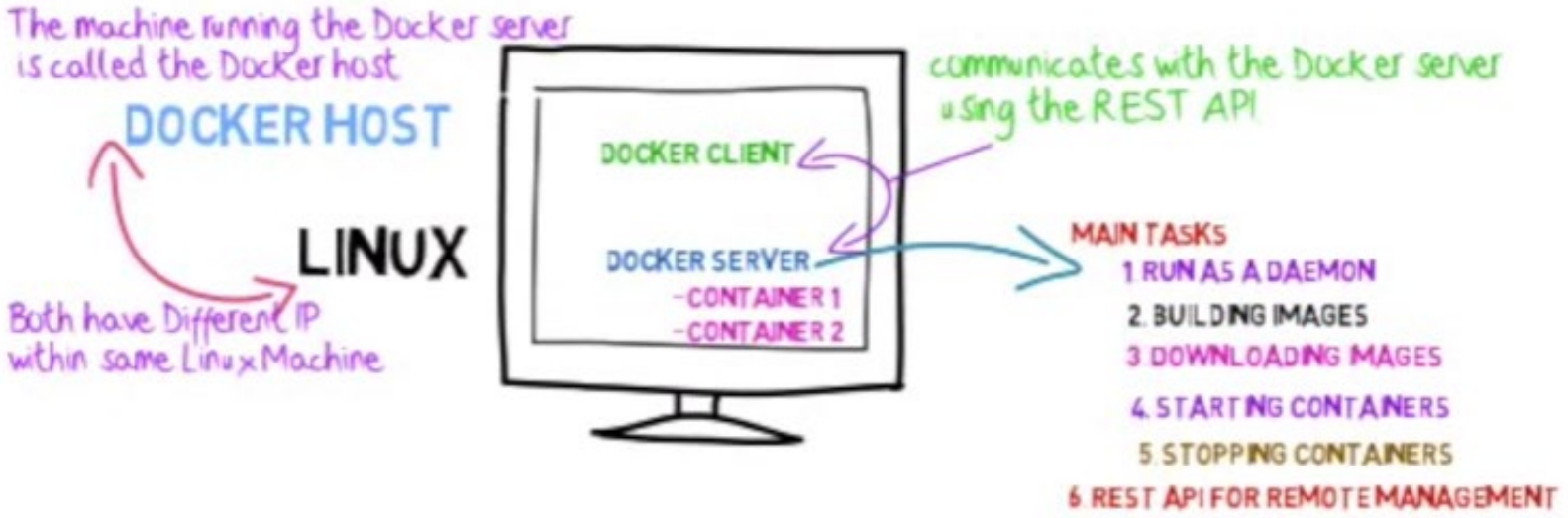
Cloud Storage

- Cloud hosting of Moodle
- File management



Docker





http://www.tomsitpro.com/articles/docker-enterprise-hub-orchestration,1-2375.html

- 6 groups
- One for each emerging technology

Each person

- Create your sentence:
  - From the perspective of your critical literacy
  - About the emerging technology

- 6 groups
- Randomized
- Using whatever method you deem appropriate, select one of the members' sentences

1. Results

1. Artificial intelligence will challenge our perspective of change in society.
2. Handheld and mobile computing are tools that will become assistants of life.
3. Blockchains make human beings measurable but don’t take into account the subjects’ dreams, fears, desires, ie, their actual humanity.
4. Cognition is left to machines so the only cognitive effort left to mankind is to remember where our iPhones are.
5. Games, sims and virtual reality: we could see it coming. Change was coming and it came. And we don’t know where it will go from here.
6. Collaborative technologies increase the number of interactions but diminish their quality.

Reflections….

- Autonomy
- Diversity
- Openness
- Interactivity

http://www.downes.ca