NEW METAPHORS FOR NETWORKED LEARNING

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Current Transformations

What has propelled network learning so far? What transformations are already in progress?

View of the Future

Which metaphors generate new ideas that become new practices?

Networked Learning

Which metaphors explain to others a universe they have not yet experienced?

Why Metaphors?

What metaphors and images open our thinking about new social, technical and pedagogical approaches to learning?

What metaphors and images – *beyond networks* – help make sense of new learning challenges

Where are we and where are we going next?
WHY METAPHORS?

You don't see something until you have the right metaphor to let you perceive it. (Thomas Kuhn)

We talk about arguments [as war] because we conceive of them that way – and we act according to the way we conceive of things. (Lackoff & Johnson)
What work do metaphors do for us?

- Structure our language and our expectations of experience
- Explain new and abstract areas with analogies to more concrete ones
- Open up new ways of looking at experience

“Try to imagine a culture where arguments are not viewed in terms of war, where no one wins or loses, where there is no sense of attacking or defending, gaining or losing round. Imagine a culture where an argument is viewed as a dance, the participants are seen as performers, and the goal is to perform in a balanced and aesthetically pleasing way.”

(Lackoff & Johnson, 1980, p. 4-5)

Examples from L&J. Wordle.net
Images of Organizations (Gareth Morgan)

- Structuring our responses to organizations, including how we react to them as employees and managers
- Organizations as:
  - Machines
  - Organisms
  - Brains
  - Cultures
  - Political systems
  - Psychic prisons
  - Flux and transformation
  - Instruments of domination

Panopticon -- Jeremy Bentham's penitentiary plan (public domain; wikipedia)
Images of Learning

Higher Education …
- Engineering
  - Efficiency, throughput, retention rate, graduation rate, modelling
  - Nimble, agile (Twidale & Nicols, 2013)
- Authoritative
  - Professors, experts, leading researchers
  - Teachers
- Parental
  - First year programs, dorms
- Self-actualizing
  - Exploration, survey courses
  - Professional identity
  - Personalized learning
- Goal-oriented
  - Metrics: graduation rates, grant amounts, numbers of publications
  - Profession, career oriented
- Place-based
  - Campuses
  - Contexts

Knowledge …
- Emergent
  - Nimble, agile, responsive, contextual, divergent, multiple trajectories, ‘lived experience’
- Individual
  - In the head, memory, autonomic skill
- Collective
  - Communities, crowds, peer-based
  - Social learning, pooled information
- Networked
  - Social, structural, relational
  - Connected, interactive
- Aesthetic or Instrumental purpose
  - Aesthetic or Efferent reading (Rosenblatt)
  - Synergistic reading (Dresang)
  - Career or work vs play, ‘serious leisure’
  - Productive (Carvalho & Goodyear, 2014)
Learning
- journey, process
- acquisition, conduit (Sfard, 1998)
- ‘adventure in discernment and self-actualization’ (Campbell, 2016, re Kuh’s 2008 high impact practices)
- ladders, trees, networks
- ubiquitous (Cope & Kalantzis)
- knowledge creation, participation

“Books are a uniquely portable magic.”
Stephen King
<table>
<thead>
<tr>
<th>Internet Metaphors</th>
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<tbody>
<tr>
<td><strong>Water</strong></td>
</tr>
<tr>
<td>Streaming, flow, deluge, leak, tsunami</td>
</tr>
<tr>
<td>Surf, navigate, anchor, pirate; Sea of information</td>
</tr>
<tr>
<td><strong>Land</strong></td>
</tr>
<tr>
<td>Frontier (unfenced, borderless, uncharted)</td>
</tr>
<tr>
<td>Islands (second life)</td>
</tr>
<tr>
<td>Commons</td>
</tr>
<tr>
<td><strong>Hunting/Farming/Food</strong></td>
</tr>
<tr>
<td>Information seekers, hunters (fr. chasseurs); Foragers, gleaners (fr. butineurs) (Jamet, 2010)</td>
</tr>
<tr>
<td><strong>Resource</strong></td>
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<tr>
<td>Mining, gold farming, data mining</td>
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<tr>
<td>Freedom</td>
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<tr>
<td>-------------------------</td>
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<tr>
<td>Free as in libre, free as in free beer</td>
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<table>
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<tr>
<th>Play and Adventure</th>
<th>Space, Place and Time</th>
</tr>
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<tbody>
<tr>
<td>(Netscape) Navigator, (Internet) Explorer, (Mac) Safari Wizard, surfer, ‘silver surfers’ Second life, Yahoo Walk, trip, journey (Jamet, 2010) Revolution!</td>
<td>“The space of flows has taken over the logic of the space of places” (Castells) Timeless time (Castells, 2009) ... a borderless space, which should not be subject to the laws applied to places [wikipedia]</td>
</tr>
</tbody>
</table>

Yet more Internet Metaphors
Explain new and abstract experiences through established and concrete experiences

• “The world of Second Life consists of nearly a half million acres of virtual land, and almost all of it belongs to other users, or Residents. As more new users join Second Life, we keep adding more and more virtual land - so the world actually gets bigger every day. Think of it this way: the world of Second Life is like a 3D version of the web, where you can explore and interact with everyone else who is using it at the same time. Virtual land is like a 3D web site: a blank space where you can make anything happen.”

  https://secondlife.com/land/faq/ (Apr 26, 2016)
  [emphasis added]

• Social media is like standing in the middle of the room and yelling ‘I LIKE BAGELS!’ and one person yelling back ‘I LIKE THAT.’
  • Ok, it’s a simile

  From ‘20 metaphors that explain social media perfectly’,
  https://blog.bufferapp.com/what-is-social-media
Gleanings - some thoughts generated by exploring metaphors

- From gleaners to seekers/hunters (chasseurs)

- What does a change from gleaners to hunters – this purposive search – mean for networked learning?
- Is our current online teaching practice grounded in the need for a critical mass of hunters rather than gatherers?
- E.g., people seeking out – hunting – for MOOCs
- And if so, what does this tell us about learning in the 21st C?

Millet, Les Glaneuses (from wikipedia)
WHAT WORK HAS THE NETWORK METAPHOR DONE FOR US?
Networked Learning

Relational, hybrid, mulit-modal, space defining, ramifying, emergent

We define networked learning as learning in which C&IT is used to promote connections: between one learner and other learners, between learners and tutors; between a learning community and its learning resources.

Some of the richest examples of networked learning involve interaction with on-line materials and with other people. But use of on-line materials is not a sufficient characteristic to define networked learning.

The interactions between people in networked learning environments can be synchronous, asynchronous or both. The interactions can be through text, voice, graphics, video, shared workspaces or combinations of these forms.

Consequently the space of possibilities for networked learning, and the space of potential student experiences, is vast.

Creating cross-boundary spaces

Sonia Livingstone: “The idea of connected learning as Mizuko Ito and others developed it … is not just that tech can link home and school but thereby school can develop the student-led interest-driven learning, knowledge and expertise that students have developed out of school.”

Drew Paulin: the ‘new’ phenomenon is that students … are bringing problems and issues from their work and ‘crowdsourcing’ them with the course community to find a solution.

Michelle Kazmer: online students connecting home community, work and local university to course university, other students workplaces and other communities – and v.v.

http://csalt.lancs.ac.uk/jisc/definition.htm
Emphasis on active, dynamic, emergent

- Networked learning
  - Actor-networks
  - Social networks
  - Activity networks
  - Socio-technical networks
  - Communities of practice
- Connecting crowds and communities (Haythornthwaite)
- Connectivism (Siemens, Downes)
- Transactional Distance (Moore)
- Connected learning (Ito et al)

Emphasis on active, dynamic, relation
- “Networks are dynamic systems that rely on self-reinforcement, without sustaining activity networks become moribund, the non-animate links and connections may remain, skeleton like, but without activity the flows across the network die out.”

The network animator can
- ‘inhibit certain features and to mobilize others’;
- ‘encourage …integration and the distribution of information across the network’;
- ‘encourage both process and practice and the reification of network activity into products of one kind or another’
  - (Jones & Esnault, 2004)
Network visualizations

SNA-Network metaphors: density, centrality, stars, brokers, isolates, cliques, structural holes, paths, reachability

Collaborating on class work

A 2-d rendering (representation, reduction) of at least a 3-d network
Wordle representation of NLC paper titles (2016)

[Removed: education, in higher *, learning, networked; plurals;
Produced from wordle.net]
WHERE ARE WE NOW AND WHERE IS THIS LEADING?

Transformations
Translations
Trends
CURRENT TRANSFORMATIONS

Transformations we – NL researchers – have speculated and written about, helped prepare audiences for, that are now all but mainstream
Transformation in **who learns what, from whom, where, when, and under what circumstances** …

- Who originates, validates, authorizes knowledge, affecting the
  - Direction of knowledge flow
  - Sources, sites and sinks for knowledge
- Where and when learning occurs
  - Mobile regarding place, device, participants
  - Enacted in multiple, daily instances
    - Just in time, and ‘In as much time as I have’
- How knowledge is continuously emergent
  - Flexibility of the knowledge base and knowledge location
  - Continuous engagement created through, and creating assemblages of the technical and social
Redefining E-learning

• More than a transfer of learning to an online stage
• Learning *not bound* by institutional structures, embracing flow across physical, geographical, disciplinary boundaries
• Sustained over a *lifetime*, yet enacted in multiple, daily instances
• *Mobile*, learning from and in new and different locations as needed and on the devices at hand.
• Engaged act created through *technical and social* decisions
Changes in learning happening against a background of transformative trends

- Networked learning
- Communities
- Knowledge building communities
- **Learning to learn with others**
- **Learning to operate in networks**

- Entrepreneurial and self-directed learning
- Networked to people and resources
- Personalized
- **Learning to be e-learners**

- Change in authority structures
- Crowdsourcing
- Contributory behavior
- **Learning to be social and participatory learners**

- Learning analytics
- Human computation
- Ethics
- Data and visualization literacy
- **Learning digital literacy**

**Integrative** – learning across platforms

**Nimble and Agile** – for a continuously emergent landscape of practice
Networked Translations

‘Translation’ in actor-network theory (Latour, as used in Jones, 2015)
• “Translation in ANT describes the links, the connections between actors. Translation is not a force or another actor it is the dynamic transformation and association that takes place between actors: ‘So, the word ‘translation’ now takes on a somewhat specialized meaning: a relation that does not transport causality but induces two mediators into coexisting’ ([Latour] 2005, p. 108).” (Jones, 2015, p. 103)

The constructive life of networks
→ Networked learning that changes the actants – learners, teachers, knowledge producers
• Learners change from listeners, to self-directed leaners (heutagogy), to learner-leaders (Montague), braiders, participatory contributors
Gleaning

• What changes – in research, practice, understanding – If we see networked learning as the *outcome* rather than the input, how does that change what we do? Networked learning as that which emerges out of the translation processes, the active engagement.

• From
  • “Networked learning as learning in which C&IT is used to promote connections”

• To
  • Networked learning is that which results from the active engagement of connected individuals
BIG TRENDS AND THEIR METAPHORS

Social Media
Big Data
Hybrids and Hybridity
Complexity
SOCIAL MEDIA

Like wind energy — Wind is free but the wind generator is not. (Kevin Mullett via Dragon Search)

Like a puppy — It’s cute and cuddly and looks easy to take care of at first, and then you realize that it needs constant attention and care. (NextGov)

https://blog.bufferapp.com/what-is-social-media
Social Media in Teaching

- **Project on Learning Analytics for the Social Media Age**
  - Anatoliy Gruzd, Marc Esteve del Valle, Drew Paulin, Sarah Gilbert, Rafa Absar
  - Exploring mindset and experience of using SM in teaching through a questionnaire (n=333 participants primarily from English speaking countries)

- **Three reasons from literature for using social media in teaching**
  - Exposing students to practices of the expected future work and communication settings;
  - Extending the learning environment to engage with sources and views outside the classroom setting;
  - Promoting a collaborative approach to learning that involves learning with others, building knowledge communities and greater reflection
Use inside or outside the LMS
Distribution of uses of SM in Teaching

How the “most useful social media tool” was used in their courses(s)

How social media was used in one specific recently taught class
Factor Analysis of coded data

PROMOTING COLLABORATION, LEARNING WITH OTHERS, GREATER REFLECTION
Individual, group and community orientation

Factor 1: Facilitating Engagement
- facilitating student participation, interaction and reflection; student learning behaviors.

Factor 4: Enhancing Student Learning
- support reflection, collaboration through group work and a group way into reflection; moving the locus of action from the teacher-student relationship to the student, and student-student relationship.

Factor 5: Building a Community of Practice
- Foster communities of practice through use of social media.

EXPOSING STUDENTS TO PRACTICES

Factor 3: Reaching Outside
- connect the class experience to knowledge and work worlds, beyond the institution or classroom

EXTENDING THE LEARNING ENVIRONMENT

Factor 6: Discovery (very few cases)
- Use for information discovery by instructor or by students.

OTHER

Factor 2: Organization for Teaching
- facilitating the organization of the activity of teaching; management of teaching practice.

Attitudes and experiences that arise from and influence ideas about SM, student population, institutional support
BIG DATA
Big data metaphors (Awati & Buckingham Shum, 2015)

What is different or not listed that would be in a vision of NL?

Can metaphor comparisons help us understand others’ perspectives?
Would you like your data raw or cooked?

- “Raw data is both an oxymoron and a bad idea; to the contrary, data should be cooked with care.” Bowker (2006)

- Data as a metaphor that drives reflection
  - “Data are not a simple reflection of a world that ‘is’ but are thoroughly produced and this has profound implications for the kinds of questions that can be asked, and answered.” (Halford, 2014, citing Bowker, 2006)

- Data cooked and served by and to programs
  - “Stephen Hawking, in his inaugural lecture for the Lucasian Chair of Physics at Cambridge … pointed to the day when physicists would not understand the products of their own work.
    With the world of string theory upon us, it is clear that we cannot “think” in the necessary 10+1 dimensions and the complex geometries they entail. Fields such as climate science or any others that deploy agent-based modeling systems are much the same. The intelligent citizen cannot read the programs that run our data sets; they can be “groundtruthed ” to some extent — though increasingly scientific models are compared primarily against other models. So let’s take the unnecessary human out of the equation and talk about the program-data-program or data-program-data cycle. (Bowker, 2013, p. 170-1, ‘Data Flakes’)
Gleaning: Complexity, 10+ dimensions, and learning analytics

- As we go further into big data – highly data and algorithmic intensive operations – the impossibility of grasping the entirety, the 10+1 dimensions, increases the need for images, metaphors, etc.

- Images then become the guiding understanding of hidden algorithmic action. The reduced set of representations become the manipulated objects. Their image becomes the motivating value for use.

- With NL, the need to understand and explain learning analytics may depend on the comprehension of the meaning, value and intention of each object that comprises the system.

- But, we’ll also need to know the algorithmic use of such objects – objects as particle and wave, or objects as agents capable of collective action, or (paradoxically) as learners, capable of processing new data.

We will need to know the computational language that informs object use and action in order to understand learning analytic object use and action.
HYBRIDS
Human-Computer Hybrids
Human-Computer Hybrids, Entanglements, Collaborations

Crowdsourcing
- Citizen science, journalism, etc.

Human sensors
- Digital traces, trails
- Digital volunteers, data collectors

Human computation
- Computing what humans (at present) do better than computers

Big data is people!

- Galaxy Zoo
  - https://www.galaxyzoo.org/
- reCAPTCHA
- Amazon Mechanical turk
  - https://www.mturk.com/mturk/welcome
- Open Street Map
  - https://www.openstreetmap.org/
- Wikipedia
  - https://en.wikipedia.org/wiki/Main_Page
Re-contextualizing

Re-attaching to personal life, local conditions, materiality, geography, etc.

Collective, shared effort to solve problems, to move toward common goals

Personal but shared need, facilitated through ICTs

And people make learning and sharing communities

- Rheingold The Virtual Community
- Wenger, Communities of Practice
- Hagar, Crisis Information Management

Hitsworthturking for: HIT (Human intelligence tasks) sharing community.
https://www.reddit.com/r/HITsWorthTurkingFor/
... Comes together in efforts like this

File:2015 04 26 Nepal Earthquake Kathmandu living lab.png

Kathmandu Living Lab

Established by Nama Budhathoki to teach mapping and enable mapping efforts in Nepal.

Ready, onsite to contribute after the 2015 earthquake

http://www.kathmandulivinglabs.org/
Hybridity of ‘New Artisans’

• Research in economics and labor suggest an increased need for human skills
  • “we expect to see growing employment among the ranks of the “new artisans”: licensed practical nurses and medical assistants; teachers, tutors and learning guides at all educational levels; kitchen designers, construction supervisors and skilled tradespeople of every variety; expert repair and support technicians; and the many people who offer personal training and assistance, like physical therapists, personal trainers, coaches and guides. These workers will adeptly combine technical skills with interpersonal interaction, flexibility and adaptability to offer services that are uniquely human.”
  • (Autor & Dorn, 2013, online, emphasis added)
Gleaning: One to Many

- Hybrid implies two
  - Human-machine
  - Human-animal
  - Two species
- What do you call it when it is more than two?
  - Mongrel, Mixed breed, Cross-breed, Cur
  - Designer
- Learners also come with lots of variety
  - First generation, next-generation, adult, independent, newbie, expert, for interest, career, etc.

Cavapoo (2)
(Cavalier King Charles x Poodle)

English Cocker (1)

Many
COMPLEXITY

Dealing with complexity, fluidity, emergence
Structure giving way to complexity

• “The clock time of the industrial age is being gradually replaced by what I conceptualized as timeless time:
  • the kind of time that occurs when in a given context, such as the network society, there is systemic perturbation in the sequential order of the social practices performed in this context.” (Castells, 2009, p. xii)

• “The concept of an educational pyramid of increasing specialization with mastery preceding originality is being dismantled
  • in favour of a mentoring-coaching-apprenticeship approach in which student are always actively engaged in the learning process.” (Gaffield, 2007, p. 6)

• “we are rethinking the established scholarly distinctions between the baccalaureate, master’s and doctoral levels.
  • Over the past decade, the emerging pattern is for all levels to adopt a construction-of-knowledge approach to the curriculum and to view a healthy research environment as a necessary condition for educational quality” (Gaffield, p.8)

• Interactions taking place within a course of nature which is not fixed and complete:
  • “The new center is indefinite interactions taking place within a course of nature which is not fixed and complete, but which is capable of direction to new and different results through the mediation of intentional operation” (Dewey, 1929, quoted in Buchanan, 1992)
METAPHORS FOR COMPLEXITY
Networks

“Networks have become the predominant organizational form of every domain of human activity. Globalization has intensified and diversified. Communication technologies have constructed virtuality as a fundamental dimension of our reality. The space of flows has taken over the logic of the space of places, ushering in a global spatial architecture of interconnected mega-cities, while people continue to find meaning in places and to create their own networks in the space of flows.” (Castells, 2009, p.xliv)
Lightweight & Heavyweight

Takes a social network analysis perspective and **ask about ties and relations**
Change metaphor from crowd and community to light- and heavy-weight

“Crowds”

**Lightweight** association between contributors and collective enterprise

e.g., SETI@Home

“Communities”

**Heavyweight** association between contributors and to collective enterprise

e.g., academic communities

MOOCs – who guides use?
Hashtags – how much weight does it take to participate?
An information ecology is a complex system of parts and relationships. It exhibits diversity and experiences continual evolution. Different parts of an ecology coevolve, changing together according to the relationships in the system. …

People’s activities and tools adjust and are adjusted in relation to each other, always attempting and never quite achieving a perfect fit. This is part of the dynamic balance achieved in healthy ecologies - a balance found in motion, not stillness.

Evolution implies a past, as well as a future. An information ecology as a persistent structure over time acquires its own history. It displays the stable participation of an interconnecting group of people and their tools and practices.
Activity System

Redefining how we think about systems, how identity is formed

Mediating Artifacts:
Tools and Signs

Subject

Object

Sense Meaning

Rules

Community

Division of labour

Outcome

Engeström’s activity system for ‘Learning by Expanding’

Important points: This is an **active** system, continuously in tension between the elements, with the outcome continuously emergent.
Building in the wicked problem

- Rapid change leads to increasing difficulty with the wicked problem of change-induced change
  - E-learning facilitated new roles for participants
    - Learner-leaders, teachers as tech support
  - Global reach and open enrolment
    - Change the make-up of the learner community
    - Wider range of reasons for participation: Interest, career, aesthetics
  - Change in technology operation
    - Google Flu Trends
  - New divisions of labour change work dynamics
    - Microlabour of Mechanical Turk – The Sheep Market
      - ‘Gig-work’ (like musicians taking ‘gig’s)
  - Change ownership of ideas, data, contributions
    - Wikis, citizen science and journalism, art
    - cf Lanier, Who owns the future

Working in the Gig Economy Is Both Desirable and Detestable. Fortune, April 27, 2016

The Sheep Market
Aaron Koblin (2006)
http://www.thesheepmarket.com/
‘Building an airplane in the air’

- “A bottom-up approach reflects a community of practice ... As a result, questions about when it begins or ends, and whether it reaches its goals make less sense. A revised set of questions then arises.”

- What does the community value? How does it evolve? How do members facilitate interaction?
  - Bruce, 2010
IMPLICATIONS

Reframing questions we ask
Reframing what constitutes learning
Reframing for new work conditions
High impact practices?
Reframing the questions we ask

• To questions about static conditions add questions about dynamic, interactive, emergent conditions and needs for working and learning
  • how to create structure → how to manage complexity
  • how to deal with uncertainty → how to deal with equivocality
  • individual knowledge acquisition → community knowledge-building
  • community knowledge-building → building from crowds and community
  • how to retrieve information → how to create knowledge
  • being in a class → defining what it means to be in a class
  • creating closed systems → working with open systems
  • authority knowledge production → peer production
  • connecting to capital → connecting to networks (Lankes, OLA)
  • connecting to employers → connecting to networks
Reframing what we consider part of learning and knowledge construction

Information
• News, research, educational materials, experience, opinion

Debate
• Discussion, argumentation; performance, play

Evaluation
• Commentaries, reviews, voting, ranking; links, page views, citations

Behaviour
• Norms, content, language, performance, FAQs; Monitoring, policing, sanctions

Experience
• Of events, life changes; as patients, parents, etc.

Practices
• Technology use; collaboration, participation, use, ethics; retention of data, information

Connectivity / Networking
• Between resources, people, ideas, media
Reframing for new working conditions

- Gig work
- Networked work
- Crowdsourced work
- Entrepreneurship
- New Artisans

What are the implications for networked learning if we use these metaphors?
- Gig learning?
- Uber learning?

Towards an Entrepreneurial Culture for the Twenty-First Century

Stimulating Entrepreneurial Spirit through Entrepreneurship Education

In Secondary School

Chapter II
Entrepreneurship: A challenge for secondary education

(ILO & UNESCO, 2006)
High Impact Practices?

• Can we now aim for a set of ‘high impact networked learning practices’ ala Kuh’s (2008) practices?

Kuh’s *High-Impact Educational Practices* (2008)
• First-Year Seminars and Experiences
• Common Intellectual Experiences
• Learning Communities
• Writing-Intensive Courses
• Collaborative Assignments and Projects
• Undergraduate Research
• Diversity/Global Learning
• Service Learning, Community-Based Learning
• Internships
• Capstone Courses and Projects

https://www.aacu.org/leap/hips
High Impact Networked Learning Practices:

*Literacy & Membership*  -- nb. Just a start!

**Networked information literacy**
- Retrieve, evaluate, critically evaluate, and synthesize information from multiple sources, engage in synergistic reading

**Networked digital rhetoric and literacy**
- Reading, writing, commenting, debating, voting, and critical analysis of networked texts, including multimedia and multimodal texts

**Networked reading**
- “connecting specialized information sets, [where] the connections that enable us to learn more are more important than our current state of knowing” (Siemens, 2005)

**Networked information evaluation and decision making**
- Continuous evaluation of the current state of networked knowledge in response to continuous acquisition of new information

**Networked membership**
- Participation, cooperation and collaboration in networked publics, citizenship, workplaces, learning settings and other collectives

**Network formation and management**
- Creation, maintenance, exploration and support of networked coalitions, crowds, communities

**Networked knowledge-building**
- Contribution to collective knowledge through synthesis, discussion, and context-sensitive networked engagement
- Shared synergistic reading, collective sense-making
FINAL THOUGHT
Final thought

• Networked Learning – make a meal of it!

http://www.upmcmyhealthmatters.com/tag/how-to-build-a-better-lunch/

Handbook of E-learning Research

2nd edition
May 2016

CFP: Learning within Digital and Social Media Minitrack

Hawaii International Conference on System Sciences
HICSS-50: January 4-7, 2017 | Hilton Waikoloa Village
Acknowledgements

- This presentation was also informed by
  - Postings from the 2015-16 Networked Learning hot seat session, particularly the weeks by Mike Sharples on ‘what works at scale’ and Sonia Livingston on ‘boundaries and limits’
  - Personal communication with members of the SSHRC funded ‘project for Learning Analytics for the Social Media Age’ (pLASMA): Anatoliy Gruzd (co-PI), Marc Esteve del Valle, Sarah Gilbert, Drew Paulin
  - Personal communication with Drew Paulin on networked learning directions
Further Reading

Although the ideas in this presentation are generally new, the closest papers at present are:


References

References