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A close-up photograph of a flowering plant with numerous small, bright pink flowers and buds clustered together. The leaves are green and serrated. The background is a soft-focus green.

# Free Learning from a Development Perspective

Stephen Downes

National Research Council Canada

July 18, 2014

Presented to Foreign Affairs, Trade and  
Development Canada

# Some Background....

- My expertise is focused around a few core areas:
  - educational theory - specifically, ways of describing how we learn, framed as 'network learning' or 'connectivism'
  - educational technology - models and systems for supporting and distributing learning through technology
  - policy and process supporting free and open access to learning

# Currently...

- I have worked at the National Research Council since 2001
  - Previously: taught philosophy for University of Alberta, Athabasca University, Grande Prairie Regional College
  - Instructional technology developer for Assiniboine Community College and the University of Alberta
  - Currently serving as Program Leader for Learning and Performance Support Systems (LPSS) at NRC, \$19 million to develop personal learning technology

# My International and Development Focus

- Experience in development education in Canada
  - with Arusha Centre and Development Education Coordinating Council of Alberta (Calgary)
  - Experience traveling to and teaching in First Nations communities in Northern Alberta, Manitoba
- Work with projects internationally
  - supporting OOPS in Taiwan, EduCamp Colombia, francophonie MOOC, work with Arab League nations

# Free Learning

- The idea that learning should be freely and openly accessible to people around the world
  - Free as in *gratis* – the idea that there should be no cost, either in terms of money or information
  - Free as in *libre* – the idea that you can reuse and share the materials and results of your learning experience
  - Open as in *door* – the idea that access to learning and learning resources is not limited by prior conditions, social status, etc.

# Three Perspectives

- What I would talk about is the idea of 'free learning' from three perspectives.
  - what can be done ('free learning' as a pedagogical approach, supported by learning theory)
  - what has been done (systems and technologies, such as open licensing, MOOCs and learning repositories, to support free learning)
  - what should be done (policy framework supporting free and open learning worldwide)

# What Can be Done

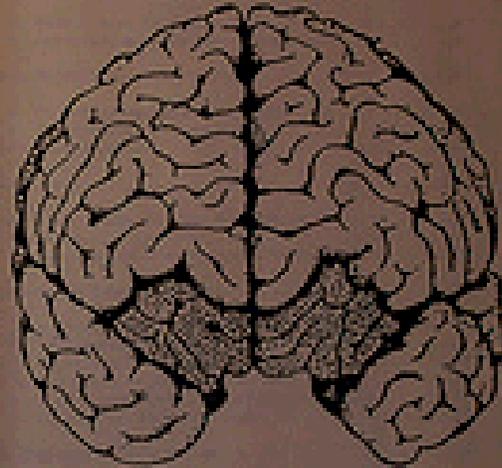
- Already occurring – the shift from instruction to engagement
  - Instruction based on behaviourist ideas of stimulus and reward, outcome based on memorization and rote
  - New constructivist pedagogies based on engagement in authentic problems, outcome based on creation of cognitive or conceptual understanding
  - Though vocal sceptics remain, constructivism is a proven approach and employed by world-leading countries (including Canada)

# Connectivism

- Knowledge is created by networks of connected entities
  - Can be personal knowledge, as in neural networks
  - Can be computational knowledge, as in connectionist software
  - Can be social, as in social network theory
- Learning is the *development* of these networks
  - A focus on both personal experience and social networks
  - Learning is a matter of practice and reflection
  - To *know* is to *recognize*

**THE  
NETWORK  
PHENOMENON**

EMPIRICISM and the NEW CONNECTIONISM



**STEPHEN DOWNES**

DEPARTMENT OF PHILOSOPHY  
UNIVERSITY OF ALBERTA

SUBMITTED FOR CANDIDACY EXAM  
22 NOVEMBER 1990

# Network Development Principles

- These inform both personal development and social development
- They are based on underlying principles supporting dynamic and responsive networks (ie., networks that can learn):
  - *Autonomy* – each entity has its own values and objectives and decides for itself
  - *Diversity* – each entity in a network is unique, both in terms of internal constitution as well as in terms role, function and perspective
  - *Openness* – membership in the network is fluid; content (signals, messages) can enter and exit the network
  - *Interactivity* – knowledge in the network is created by the interactive process (as opposed to the content of signals propagated through the network)

# Free Learning and Connectivism

- These reinforce and depend on each other
- For example, autonomy as a pedagogical principle creates a requirement for:
  - *Access* to learning materials and resources without cost or barriers
  - *Connection* with other learners by means of sending signals to other network entities (learners, instructors, friends and associates)
  - *Open learning* or the ability to join networks regardless of qualifications or social standing

# The learning process

- To learn is to practice and reflect; to teach is to model and demonstrate – each member of the network both learns and teaches
- A rough outline of a learning process:
  - *Aggregate* – seek out connections and obtain resources through those connections
  - *Remix* – join the resources from multiple connections together
  - *Repurpose* – adapt the remixed resources
  - *Feed Forward* – send the newly created resources on to the next nodes in the network

# What Has Been Done

- Network theory is established in multiple domains
  - Foundation in mathematics, as graph theory
  - Computer science – connectionism and neural networks
  - Biology – ecology and ecosystems
  - Sociology – social network analysis
  - Physiology – perception, neuroscience
  - Philosophy – information theory, distributed representation

# Examples of network in operation

- Networks in nature, such as the murmuration
- Social organization, such as corporate networks, political networks
- Infrastructure, such as the electrical grid
- The internet, a worldwide information network
- Social networks, such as discussion boards, web sites, Facebook, Twitter

# Identification of Network Principles

- The internet – based on a distributed and connective architecture
- Open Source Software as a form of organization (the Cathedral and the Bazaar)
- Forms of organization – networks are conversations (the Cluetraion Manifesto) – small pieces loosely joined
- Open Access and Open Archives Initiative

# Open Educational Resources

- A subset of open access in general, focused on learning resources
  - Defined as a concept by UNESCO in 2002
- May be based in a set of educational standards defining learning resources specifically
- The status of OERs may vary considerably depending on the licensing adopted

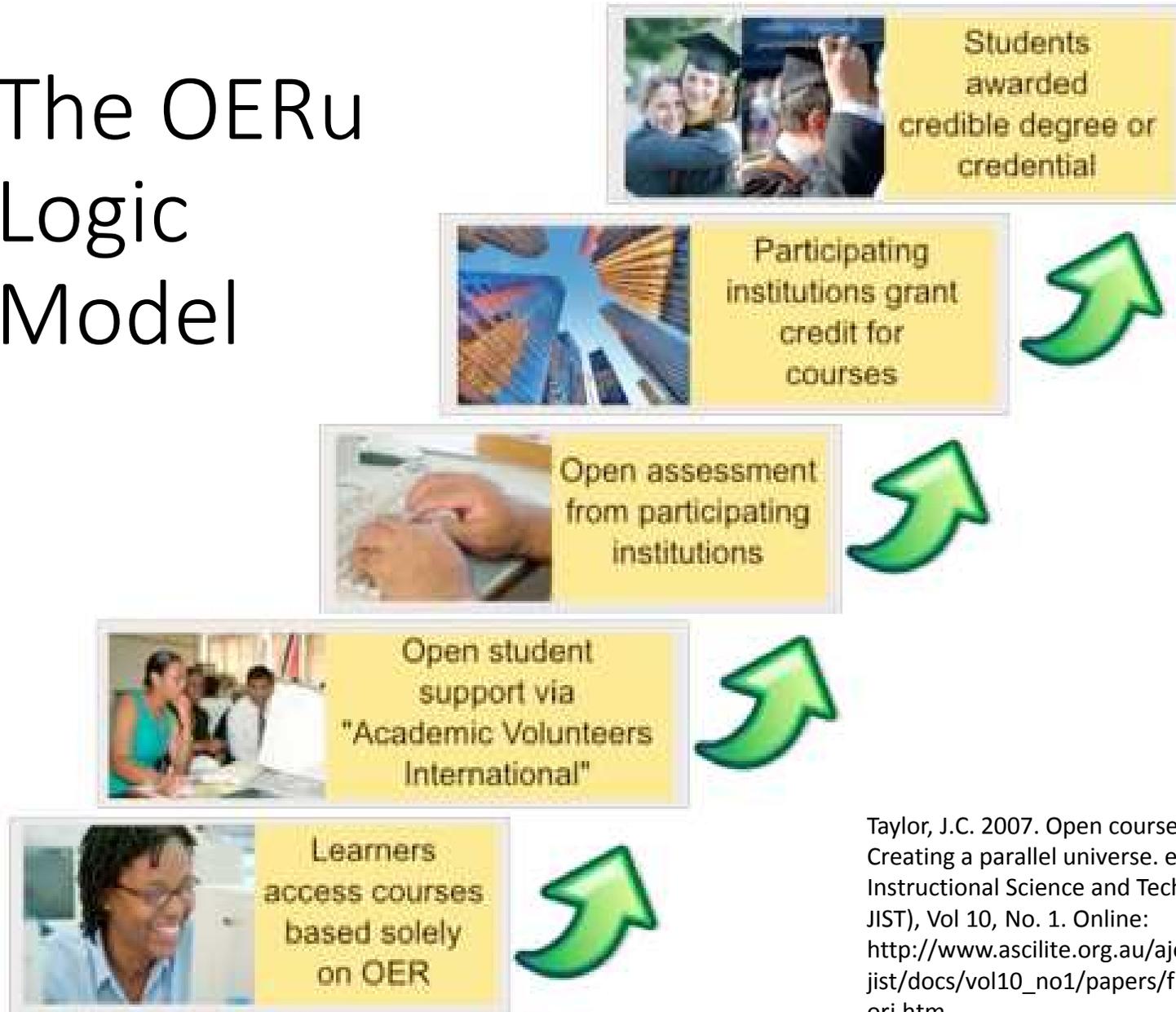
# Licensing Models

- GPL or 'viral' licensing – enables free sharing of resource, on the condition that the license travels with the resource, even if the resource is adapted – for documents, GFDL
- Creative Commons – a set of licences supporting free sharing, with 'some rights reserved' by the author
  - Attribution, Share-Alike, Non-Commercial, No-derivatives
- Open access, rights reserved – copyright content enabled for free access (eg. YouTube videos) but *not* licensed for reuse or sharing

# OERs in Traditional Courses

- Course components or entire course packages are created and made available online, suitable for discovery and redistribution
  - Rice University's *Connections* – a course building resource
  - WikiEducator / OERu– OERs built using a wiki system (also: Wikiversity, Curricki)
  - MIT OpenCourseware – learning resources only
  - Open University OpenLearn – complete learning packages
- The focus is on reuse by educators or other teachers, who would access these materials and adapt them to local use

# The OERu Logic Model



Taylor, J.C. 2007. Open courseware futures: Creating a parallel universe. e-Journal of Instructional Science and Technology (e-JIST), Vol 10, No. 1. Online: [http://www.ascilite.org.au/ajet/e-jist/docs/vol10\\_no1/papers/full\\_papers/taylorj.htm](http://www.ascilite.org.au/ajet/e-jist/docs/vol10_no1/papers/full_papers/taylorj.htm)

# Criticism of the Logic Model

- Traditional Curricular based approach
  - a focus on articulation & credit transfer
  - closed federation of traditional institutes
- Tight link to traditional credentials
- The Black Box problem – ‘open’ this or that (eg. ‘open business model’) unstudied and undeveloped

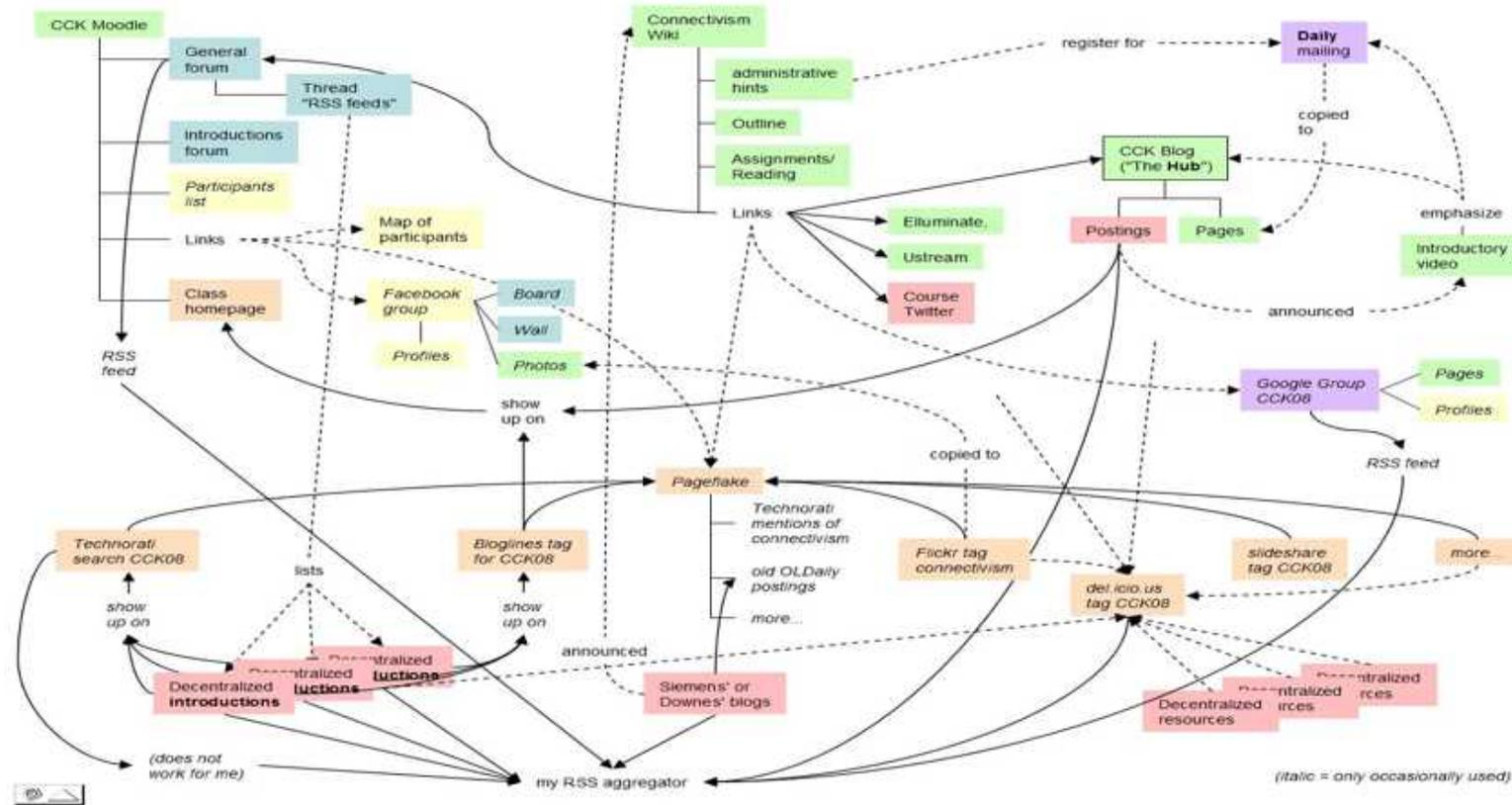
# The Connectivist MOOC (cMOOC)

- Instead of seeing a course as a series of contents to be presented, envisions a course as a network of participants who find and exchange resources with each other (2008)
  - An initial structure is developed and ‘seeded’ with custom-built or (preferably) existing OERs
  - Participants are encouraged to use *their own sites* to create or share resources
  - A mechanism (gRSShopper) is employed to *connect* these disparate sites with the course core and distributed participant sites

<http://www.connectivistmoocs.org/what-is-a-connectivist-mooc/>

<http://change.mooc.ca/how.htm>

# A Map of the Community



Connectivism: A Theory of Personal Learning  
Stephen Downes, December 3, 2008, Educational Development Centre, Ottawa  
<http://www.downes.ca/presentation/208>

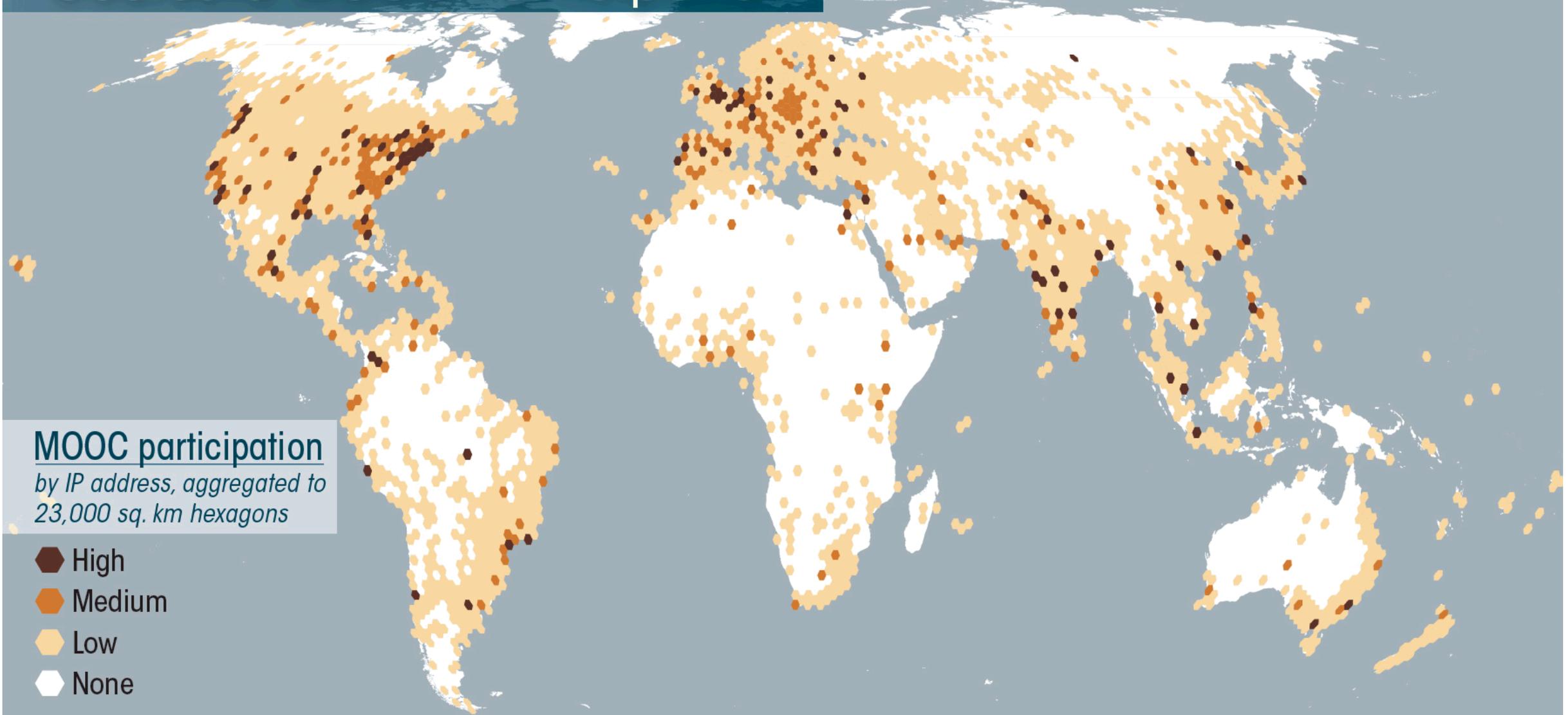
# The eXtended MOOC (xMOOC)

- Combines open access and traditional course structure
  - First such was Stanford's AI course (2011)
  - Content tends to be open access only and is bespoke created
- Spawned a number of highly visible initiatives
  - Coursera, Udacity launched by Stanford AI founders
  - EdX created by a consortium of eastern universities (MIT, etc)
  - Open University launched FutureLearn
  - Existing LMS companies have created 'open' versions of their platforms
  - Numerous other initiatives (eg. Codeacademy)

# What We Know

- There is a huge pent-up demand for open online learning (market projected to have 58% CARG)
- This demand is world-wide (initial results notwithstanding)
- The widespread adoption of open online learning will require both infrastructure and policy initiatives

# Coursera MOOC Participation



3+ million of 5+ million locatable IP addresses represented on the map

<http://www.insidehighered.com/blogs/globalhighered/mapping-courseras-global-footprint#sthash.gim8di2J.dpbs>

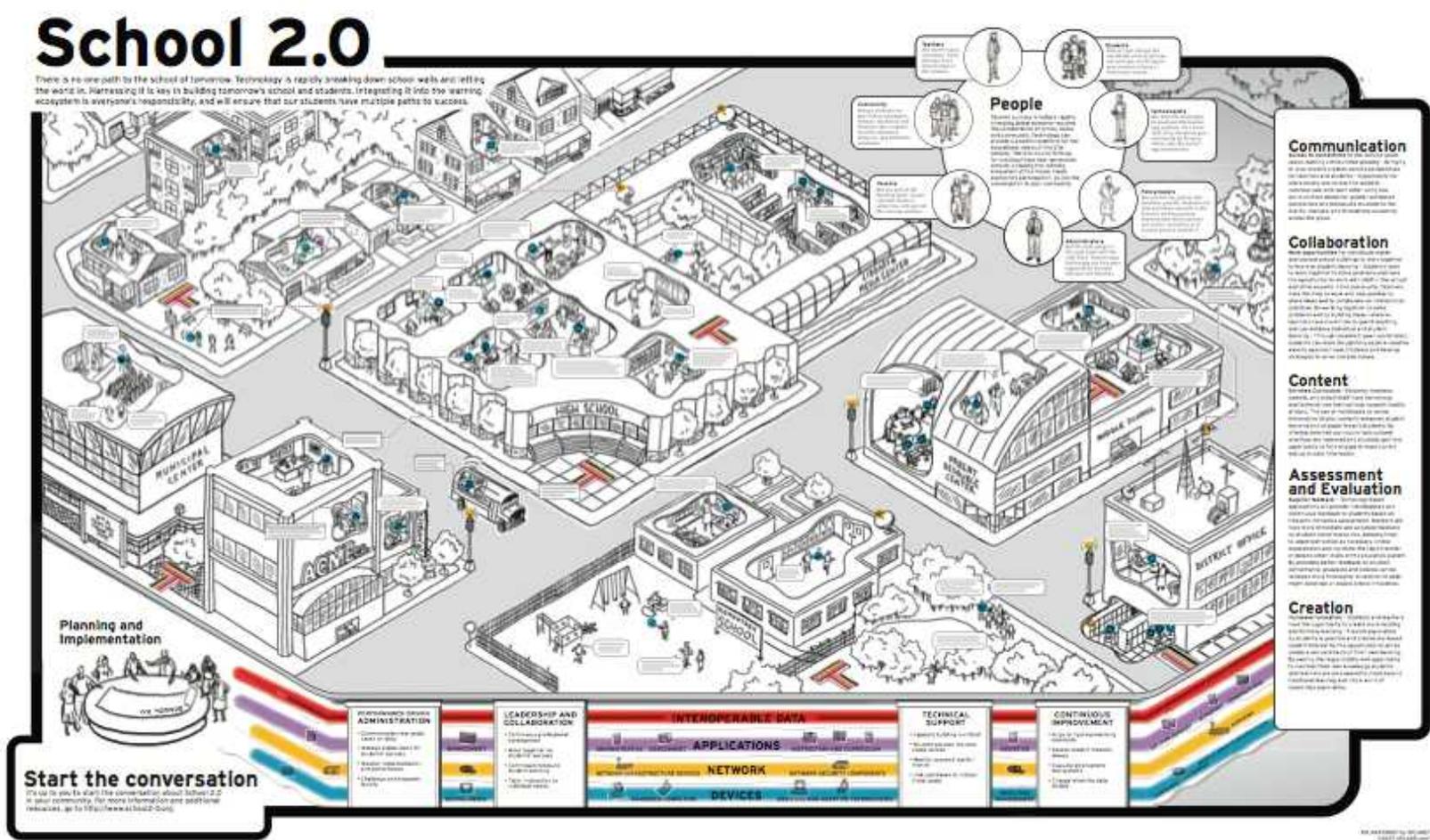
# What Should be Done

- Criticisms of MOOCs (and especially xMOOCs)
  - Content is often open access only, and cannot be shared
  - Traditional course structure is instructivist in nature
  - They serve mostly educated professionals from the developed world who already have degrees
  - Significant internet overhead required to provide access

# A Connectivist System

- We began by applying connectivism to courses only
- Ultimately, network learning is best supported with a connectivist system
  - This has a basis in *personal learning* rather than the existing community focus
  - Note: not 'personalized' but actually *personal*
- Personal learning is based on the needs of individuals, in the context of their actual community
- It is an emphasis on informal and practical learning, such as performance support

# The Old School 2.0





# New Roles for Government

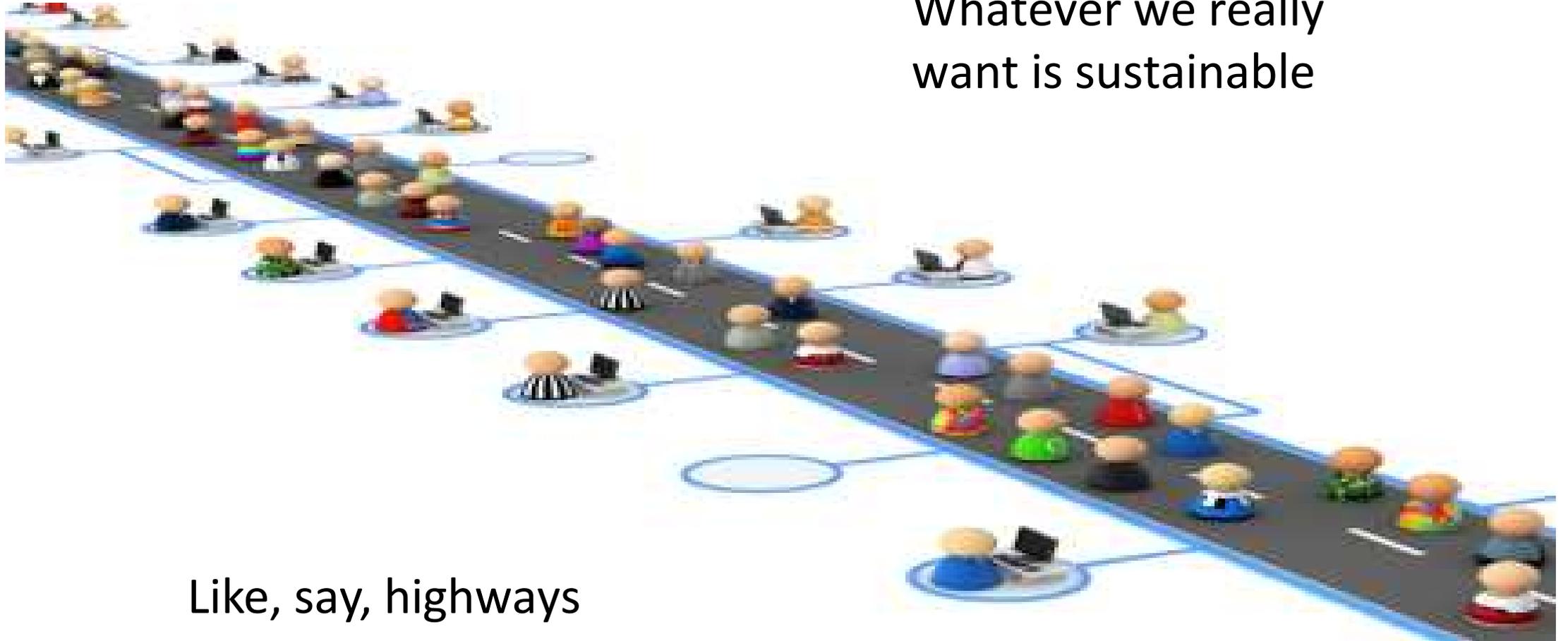
- Communications and Education Infrastructure
- Support for Open Educational Resources
- Support for Free Learning
- Management of assessments and credentialing

# The Digital Infrastructure

- Public high-speed backbone networks
  - used not only for education but for other public services: police, fire and emergency, hospital, municipalities, etc.
- Local Access
  - eg. CAP Centres
- Legal Framework
  - policy on digital rights and copyright
  - net neutrality and similar regulations

# A Note on Sustainability

Whatever we really  
want is sustainable



Like, say, highways

# Sustaining Infrastructure

- Support for existing programs and services
  - cost reductions in communications overhead
  - improved efficiency of public service delivery
- Overhead on entertainment and commercial infrastructure
  - similar to broadcast 'CanCon' requirements

# Standards

- Embrace standards that are syntactic in origin, resist standards that are semantic in origin
  - ‘syntactic standards’ are mechanisms that support connection and communication (like the mechanisms for connecting phones, specification of how a lightbulb screws into the socket)
  - ‘semantic standards’ address the content of the network (like the conversations people have on the phone system, like the type of bulb or colour of light it emits)

# Open Educational Resources

- Traditional Resources
  - Already developed and paid for by government
  - Open access initiatives
- Public Policy Resources
  - design to serve a public end or objective
  - focus on basic literacies & community empowerment

# Sustaining OERs

- Redirection of existing resource allocations
  - eg. OA mandates for grants and programs
  - community outreach for existing agencies
    - eg, NASA
- Support for community-based OER process
  - integration of OER development and use within publicly supported curricula
  - use of OERs in public services and programs

- Stephen Downes, Models for sustainable Open Educational Resources, [ijklo.org/Volume3/IJKLOv3p029-044Downes.pdf](http://ijklo.org/Volume3/IJKLOv3p029-044Downes.pdf) <http://www.downes.ca/presentation/76>

- OER Help with Keynote Slides, OER-Forum <http://lists.esn.org.za/pipermail/oer-forum/2011-October/thread.html>

# Software and Service Support

- Software and environment support
  - eg. Public Knowledge Project Open Journal Systems, Moodle, et
- Service networks and support
  - JISC / CETIS, EdNA, etc.
  - Common Services - eFramework

# Sustaining Support Systems

- Development and systems research support
- Public adoption of open licensing
  - FLOSS
    - GNU/GPL, BSD, etc
    - Creative Commons
  - directs resources toward multi-sector development
- Community service requirement for commercially sourced software

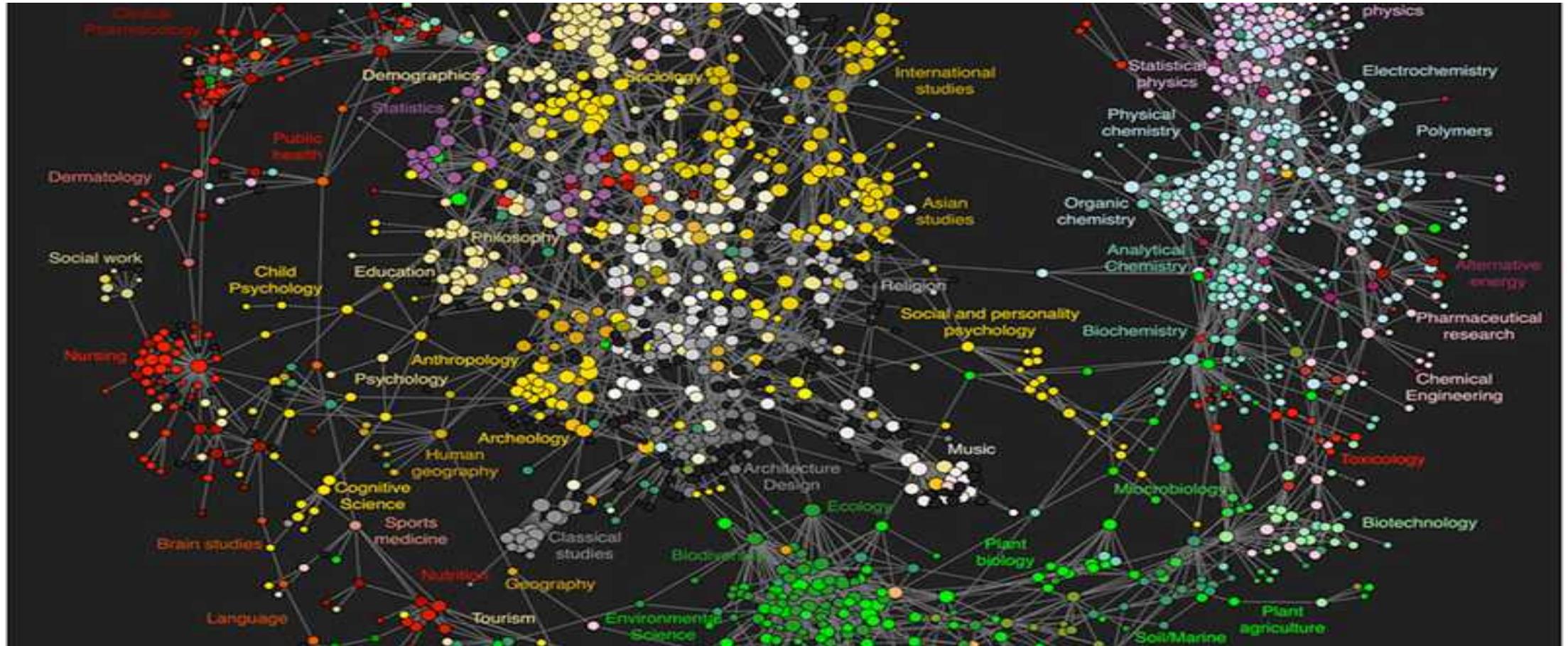
# Assessment and Credentialing

- Major policy initiatives
  - separation of delivery and assessment
    - an end to Digital Diploma Mills
  - management of credentialing by professional associations under a regulatory framework
  - development of community-based assessment metrics and infrastructure
    - move away from simple testing, toward authentic community engagement and referrals

# Assessment and Credentialing (2)

- Support for Personal Learning
  - provision of personal learning environments and frameworks
    - promote lifelong learning
    - link to skills database, corporate training registries
    - direct support for employment and funding
  - personal portfolios and credential banks
    - voluntary, self-managed
    - optional identity frameworks

# New Roles for Research



# Community = Interactions

- Not 'spreading the word'
- Not 'amplification'
- But rather, the creation of our own society, together
  - emergent from the free actions of each of us
  - not based on the ideas of one (or a small number) of individuals

# Open Communities are Free



Dave Pollard, the Metamovement <http://howtosavetheworld.ca/2011/10/20/the-metamovement-moving-beyond-marches-and-people-in-the-street/>

- I'll be clear at the outset that my expertise is not in the area of providing basic education. So there are aspects of what you do in your office that I will not be able to touch upon. Rather, my expertise is focused around a few core areas:
  - educational theory - specifically, ways of describing how we learn, framed as 'network learning' or 'connectivism'
  - educational technology - models and systems for supporting and distributing learning through technology
  - policy and process supporting free and open access to learning

So, what I would talk about is the idea of 'free learning' from these three perspectives. In particular, the talk could break into three phases:

- what can be done ('free learning' as a pedagogical approach, supported by learning theory)
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How is that?