The World Beyond the Word



Destination: Innovation, Banff Centre, August 18, 2012

• Presentation Page:

– <u>http://www.downes.ca/presentation/299</u>

 View slides, save to view video, listen to audio, etc. etc.

• The Abstract

One of the primary tasks of an educational system is to foster creativity and innovation in its students - but what does that mean? We are inclined to tie innovation to phenomena that can be described in so many words - "if it can't be measured it can't be managed," or so the saying goes. In the field of education, however, we deal every day with learning and discovery that goes beyond what we can describe. This is a form of 'knowledge by recognition' - and can be as simple (and difficult) as 'how to recognize a cat' or as difficult as advanced pattern recognition in complex systems such as weather patterns, ecosystems, and human society. In order to manage the deluge of data produced by modern technology, a rapidly changing society, and challenging environmental and economic systems, we need to relearn what we understand as social and scientific literacy. The students of today and the innovators of tomorrow will speak languages we barely recognize today. What are the fundamentals of these new literacies, how do we learn them and teach them, and how do they redefine innovation in the future? In this talk Stephen Downes describes a future in which learning is a creative act and the environments and technologies that will be needed to support this learning.

- Tomorrow morning... Becoming an Astronaut
 - Join Major Jeremy R.
 Hansen as he discusses his journey to becoming an astronaut and the multidisciplinary training required for space flight.



August 20; 8:45 a.m. — 9:45 a.m.

 One of the primary tasks of an educational system is to foster creativity and innovation in its students - but what does that mean?

- Innovation*
 - is the creation of better or more effective [stuff] that are readily available to markets, governments, and society.
 - innovation refers to the use of a better and novel idea or method, whereas invention refers more directly to the creation of the idea or method itself.

(*) Wikipedia - http://en.wikipedia.org/wiki/Innovation

Cover Image: The World's (Phone) Reactions to Obama's Inauguration http://radar.oreilly.com/2009/06/the-worlds-phone-reactions-to.html

• An overwhelming preference for engineering and health (with a nod to environment)



Reported from the Canada Foundation for Innovation, Annual Report 2010-11 p. 7, http://www.innovation.ca/en/AboutUs/PublicationsandReports/Annualreport

 Some innovations: http://www.nytimes.com/interactive/2012/06 /03/magazine/innovations-issue.html The five ways of Aquinas*



- Argument from Motion everything that moves is moved by another
- Argument from Efficient Cause there must be a First Cause
- Argument to Necessary Being existing things depend upon other things for their existence
- Argument from Gradation there must exist something that is an Absolutely Good Being
- Argument from Design a Great Designer exists.

(*) Lovingly listed for us at http://philosophy.lander.edu/intro/aquinas.shtml

- metaphysical theory of innovation
 - innovations result from prime causes, first movers, or 'drivers'
 - Drucker* "purposeful search for innovation opportunities" such as:
 - unexpected occurrences, incongruities
 - process needs, industry & market changes
 - demographic changes, perception changes
 - new knowledge

(*) Liberated from the copy-protected source at HBR, 'The Discipline of Innovation', Peter Drucker, p. 4, http://www.omegaproject.info/uploads/9/4/7/3/9473028/_the_discipline_of_innovation.pdf

- character theory of innovation
 - being an innovator requires having the right 'character'
 - typically this means having certain traits, for example, 'willing to take chances', 'Driven and aggressive, yet sensitive'*, etc.
 - what's missing is (a) a process for acquiring these characteristics, and (b) a link between these characteristics and innovative acts

(*) Shamelessly stolen from Lemke, slide 14,

http://ncliteracy.metiri.wikispaces.net/file/view/NC-Creativity%26Innovation2.pdf

- Cheryl Lemke, Creativity and innovation in K-12
 - "How do we keep creativity and innovation alive in schools? And more basically, what is it? What does does creativity look like in a 3-year-old? In a grade 4, 7, or 10 student?"

Monday August 20; 2:30 p.m. — 3:30 p.m.



- teleological theory of innovation
 - innovation works according to a design or plan
 - innovators are expected to be goal- or outcomedirected
 - a 'prior art' is typically required, eg. 'innovation means asking good questons'

- environmental theory of innovation
 - create the right environment, and creativity will follow
 - most famously: the Googleplex, MIT Media Lab, etc. (every engineer a foosball table)
 - can be expressed negatively, as descriptions of environments that stifle creativity* such as monitoring, testing, competition, etc
 - (*) Again, see Lemke, slide 24,

http://ncliteracy.metiri.wikispaces.net/file/view/NC-Creativity%26Innovation2.pdf

- functional theory of innovation
 - "categorizing firms and individuals in terms of the functional relationship through which they derive benefit from a given product, process, or service innovation."*
 - Eg, airline firms are users of aircraft because the benefit they derive from existing types of aircraft
 - So: find the function, find the innovation eg. find user sources of innovation

(*) Eric von Hippel's text 'Sources of Innovation' was found to be useful here. Ch. 1., p. 3, http://web.mit.edu/evhippel/www/sources.htm

- economic theory of innovation
 - there is a financial return to be derived from innovation
 - von Hippel: "innovating firms could reasonably anticipate higher profits than noninnovating firms."
 - therefore, profit is a motivating factor for innovation (and innovation can be found through maximizing profits)

(*) Eric von Hippel's text 'Sources of Innovation' had the money quote. Ch. 1., p. 6, http://web.mit.edu/evhippel/www/sources.htm

We are inclined to tie innovation to phenomena that can be described in so many words - "if it can't be measured it can't be managed," or so the saying goes.

A Frame to talk about Innovation

- Consider the article on innovation in ecducation*
 - "...trying to find innovative ways to bring greater access, lower costs ... to drive better learning efficacy."
 - "several factors have changed the opportunity landscape for investors, including policy changes at the federal and local levels (etc.)"
 - "a major difference between the environment now and the one a decade ago seems to be the talent and experience of the people leading the innovation"

(*) Schooled by GigaOm, Investment in K-12 education innovation is soaring, but it's not all rosy, http://gigaom.com/2012/08/02/investment-in-k-12-education-innovation-is-soaring-but-its-not-all-rosy/

- Democratizing innovation*
 - "users of products and services—both firms and individual consumers—are increasingly able to innovate for themselves."
 - "Users that innovate can develop exactly what they want, rather than relying on manufacturers to act as their (often very imperfect) agents."

(*) Eric von Hippel's text 'Democratizing Innovation' gets my vote, http://web.mit.edu/evhippel/www/democ1.htm



- Democratizing innovation (2)
 - users often freely reveal what they have innovated (a practice that long predates open source)
 - von Hippel: "if the information needed to innovate in important ways is widely distributed, the traditional pattern of concentrating innovationsupport resources on a few individuals is hugely inefficient."

- Mark Edwards, a framework for leadership in the digital world
 - "the use of digital resources and leveraging a distributed leadership team will be topics of review and discussion"
 - democratizing technology conversion?
 - elements of democracy: autonomy, diversity, etc...

Monday August 20; 1:00 p.m. — 3:30 p.m. Tuesday August 21; 11:00 a.m. — 12:00 p.m.



What makes a *society* innovative?

 Where does innovation come from? Not from measurement, management or market focus.
 No, it comes from literacy.

Traditional Literacy

- Traditional literacy*: Literacy refers to the ability to read for knowledge and write coherently and think critically about the written word.
- UNESCO: "Literacy is the ability to identify, understand, interpret, create, communicate and com- pute, using printed and written materials associated with varying contexts." •

(*) Wikipedia, where else? htp://en.wikipedia.org/wiki/Literacy
(*) UNESCO declafed this, The Plurality of literacy and its Implications for Policies and Programmes, 2004 http://unesdoc.unesco.org/images/0013/001362/136246e.pdf

In the field of education, however, we deal every day with learning and discovery that goes beyond what we can describe.

 What is literacy? It isn't just language and numbers; literacy is the capacity to *recognize* what is relevant, useful, true

Functional Literacy

- "Literacy as Freedom" UNESCO
- "the concept of "functional literacy" marked a turning point in the modern history of education. It allied education and especially literacy with social and economic development."
- Paulo Freire political dimension of literacy -"conscientization"

- Keith Krueger, Reimaging Learning
 - Or 'reimagining learning'?
 - "society has moved to a more Participatory Culture where information and expertise is increasingly less hierarchical and society is more participatory."
 - Speaking in LOLCats?

Monday August 20; 11:00 a.m. — 12:00 p.m.



Multiple Literacies

- "Visual literacy includes in addition the ability to understand all forms of communication, be it body language, pictures, maps, or video."*
- Howard Gardner "proposes eight different intelligences to account for a broad range of human potential in children and adults."
- They are:

(*) Wikipedia again

(*) Nicole Guevara gives us the list on her website, https://sites.google.com/site/multipleliteracies/howardgardner/home/assessment/videos/literacies



Ilustrated for us from Nicole Guevara, https://sites.google.com/site/multipleliteracies/howardgardner/home/assessment/videos/literacies

- Jenkins needed skills in a 21st century culture
 - play experiment with one's surroundings
 - performance adopt alternative identities
 - simulation build dynamic models
 - appropriation sample and remix
 - multitasking scan and shift focus

— etc (several others) Appropriated from Henry Jenkins, Confronting the Challenges of Participatory Culture, http://digitallearning.macfound.org/atf/cf/%7B7E45C7E0-A3E0-4B89-AC9C-E807E1B0AE4E%7D/JENKINS WHITE PAPER.PDF

- The flipped classroom
 - places the emphasis on the application of skills in the classroom
 - Patrick Bohnet and Ken Hakstol, Flipping Your Instruction

will model the process that you could use with your students.. will demonstrate a variety of ways to adapt your instruction to the flipped instruction model and you will experience the process for yourself.

Monday August 20; 1:00 p.m. — 3:30 p.m.



21st Century Skills Literacies



The 'skills' described by Jenkins and others *performance, simulation, appropriation, etc* - are actually *languages* and should be understood *through a framework of literacy*

Image swiped from http://spotlight.macfound.org/btr/entry/new_media_literacies/

- There's even an 'innovation literacy'*:
 - "the ability to think creatively, evaluate, and apply problem-solving skills to diverse and intangible issues within industrial problems and multidisciplinary contexts."
 - See also OECD 'Skills for Innovation and Research' +

(*) Innovatively and literately created by George Brown College – http://applied-research.blogspot.ca/2009/01/innovation-literacy.html
(*) Blocked from the rest of us by OECD at http://www.oecdbookshop.org/oecd/display.asp?sf1=identifiers&st1=9789264097490

- How do we understand and teach these multiple literacies without dividing knowledge into a series of 'literacy silos'?
- Andrew Flowerdew (today on Google+)*: "Whilst well meaning, often these lesson fail to move learning forward in a morass of unconnected, disjointed segments that may confuse as much as they do enlighten."

(*) G+ed here: https://plus.google.com/u/0/109526159908242471749/posts/B2zz9HgUi8Z

This is a form of 'knowledge by recognition' and can be as simple (and difficult) as 'bow to

and can be as simple (and difficult) as 'how to recognize a cat' or as difficult as advanced
pattern recognition in complex systems such
as weather patterns, ecosystems, and human
society.

Critical Literacies

- Critical literacies are the elements in common across all literacies
- They give us a mechanism for understanding what it means to be 'visually literate', 'musically literate', 'computer literate', etc.

Critical Literacies



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

21st Century Literacies

Literacies	Verbal	Visual	Bodily (and so on)
Elements			
Syntax			
Semantics			
Pragmatics			
Cognition			
Context			
Change			

Syntax

For example, rules and grammar



What is it 'to know' syntax? What is 'syntax literacy?'

- The many forms of syntax (audio)
 - Forms: archetypes? Platonic ideals?
 - Rules: grammar = logical syntax, punctuation
 - Operations: procedures, motor skills
 - Patterns: regularities, substitutivity (eggcorns, tropes)
 - Similarities: Tversky properties, etc
- Ag. audio syntax
 - <u>http://www.soundsnap.com/search/audio/inhale+woman/sco</u>
 <u>re</u> (once you hear this in video, you can't unhear it)
 - the Wilhelm Scream http://www.youtube.com/watch?v=cdbYsoEasio

- Universal design for learning a syntax?
- Kathy Howery 21st Century Inclusive learning
 - Moving UDI from the promise to the practice

"three principles of UDL, providing multiple means of representation, expression and engagement can be practically achieved with today's technologies."



Tuesday august 21; 1:00 p.m. — 3:30 p.m.

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/

- Literacy Levels
 - The very idea of literacy levels* eg.
 - Level 1 basic word recognition, memorization
 - Level 2 plain language reading only
 - Level 3 words and concepts 'in the marketplace'

Level 4,5 – technical reading, jargon, etc.
 Problem: this is mostly a depiction of literacy as remembering – most 'simple' theories of literacy have this form – remembering word / sound / object association

(*) Leveling up from Windsor Public Library http://www.windsorpubliclibrary.com/literacy/levels.php

- More on Literacy Levels
 - Logographic is defined as reading and writing that relies on context.
 - Alphabetic reading is defined as the attempt to use sound-letter correspondences in reading and writing.
 - Orthographic highly sophisticated and complex understanding of written language

Written very well by Education Service Center, Region 2 in http://www.esc2.net/centers/instructional/ADTech/FACES-Language%20Arts/Literacy%20Levels.doc.pdf

- Varying conceptions of knowledge:
 - 'knowledge' as 'remembering'
 - 'knowledge' as 'understanding'

– etc.

- Note how the definition of 'innovation' in this context is focused on:
 - 'knowledge' as 'using'
 - 'knowledge' as 'applying'
- Bloom's will take us further...

• Bloom's Taxonomy / Revised Bloom's



Image applied at Concordia, http://teaching.concordia.ca/resources/teachingwith-new-technologies/using-clickers/pedagogical-faqs/ • Karen Brennan

From unaware to everywhere: young people as designers of interactive media



Karen shares how work at the MIT Media Lab supports the transition to creating, rather than consuming, digital

media.

Tuesday August 21; 8:45 a.m. — 9:45 a.m.

• A taxonomy for syntax literacy:

Create (intuitively)
 Choose
 Discover
 Recognize
 Rember (rules, patterns, principles, etc)

 Why these? They are based on a theory of knowledge as recognition rather than remembering, understanding, applying, etc.





To create one of these

Knowledge consists of *neural* connections, not facts and data

Simple vs complex – text vs network

"Paris is the capital of France"



It is the difference between:

- 'Knowing' that 'Paris is the capital of France' or even some sort of 'knowing how' (these are *external* definitions of this knowledge) and
- What it *feels like* to have geographical knowledge;
 what it *feels like* to be a speaker of a language

Learning a discipline is a *total state* and not a collection of specific states

- Learning a discipline is a *total state* and not a collection of specific states
- It is obtained through *immersion* in an environment rather than acquisition of particular entities
- It is expressed functionally (can you perform 'as a geographer'?) rather than cognitively (can you state 'geography facts' or do 'geography tasks'?)



By perfomance in this

There are not specific bits of knowledge or competencies, but rather, personal capacities

Semantics

theories of truth / meaning / purpose / goal



- Curriculum as semantics?
 - makes me think of Elliott Soloway and Cathie Norris, Education in the Age of Mobilism

Schools have used computers – desktops to laptops, standalone to online – to "better" implement the existing curriculum – a curriculum that was initially design by the Committee of Ten to prepare students to enter Harvard -- in 1892.



Wednesday August 22; 8:45 a.m. — 9:45 a.m.

- The Semantics of Pedagogy (Soloway and Norris, cont.)
 - "the transformation of the classroom from 'I Teach' a teacher-centric, didactic, direct instruction, 19th century, boring and ineffective pedagogy to 'We Learn,' a student-centric, project-based, inquiry-oriented, 21st-century pedagogy."
 - Changing bases of truth, authority, object, goal

- The many meanings of semantics
 - 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
 - Value, objective, goals, desires, meaning (as in 'of life')

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)

- Critical thinking skills...
- Howie Diblasi, Cultivating creativity and critical thinking in education
- Ten web 2.0 projects...

I will be looking for the link between creativity and critical thinking



Monday August 20; 1:00 p.m. — 3:30 p.m.

Workshop Tuesday August 21; 1:00 p.m. - 3:30 p.m.

Context

placement, environment

			instrumental	Savoring	mophactonal
Instrumental Eating to get things done	Savoring Engaging in food for the sake of plea- sure or entertainment	Inspirational Epicenter of trends; incubator of things to savor in the future			23
INC	REASING SOPHISTICATION		RED BULL	STARBUCKS	TINY FRENCH VINTNER
 Price sensitivity Iconic experience Quick and easy Moderation Positive nutrition Absence of negatives Functional benefits 	 Freshness Flavor distinction Narrative Local Seasonal Street Culinary tradition Culinary assistance 	 Small craft production Heirloom / heritage Knowledge Passion Technoemotional Slow 			

Inchinational Inchinational I

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



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

• We used to speak in metaphors. Today, we can live our metaphors.



http://amnestyusa.org/pussyriot





http://www.youtube.com/watch?v=X0il0pgTUx0

- <u>http://www.downes.ca</u>
- Free Learning

Stephen Downes