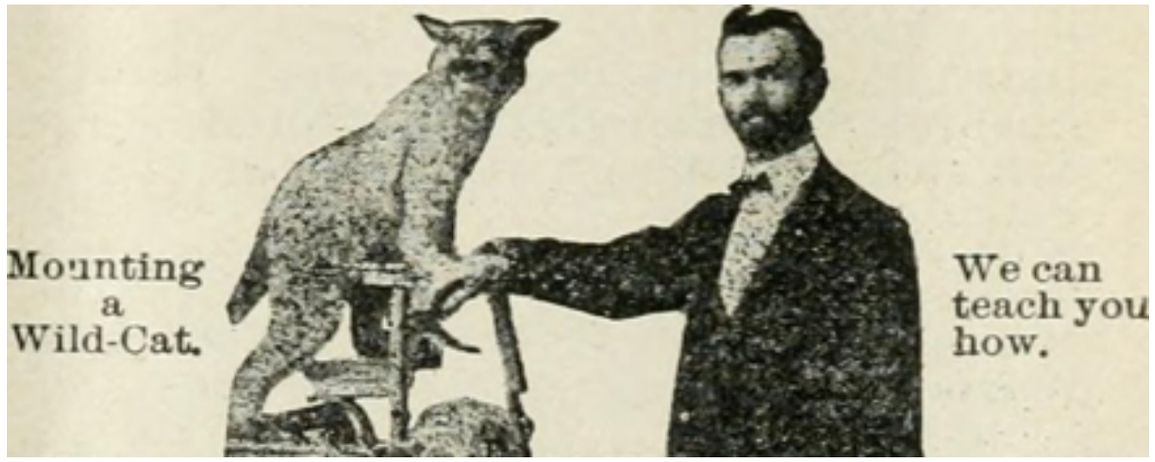


Technology, technique and teaching

Jon Dron

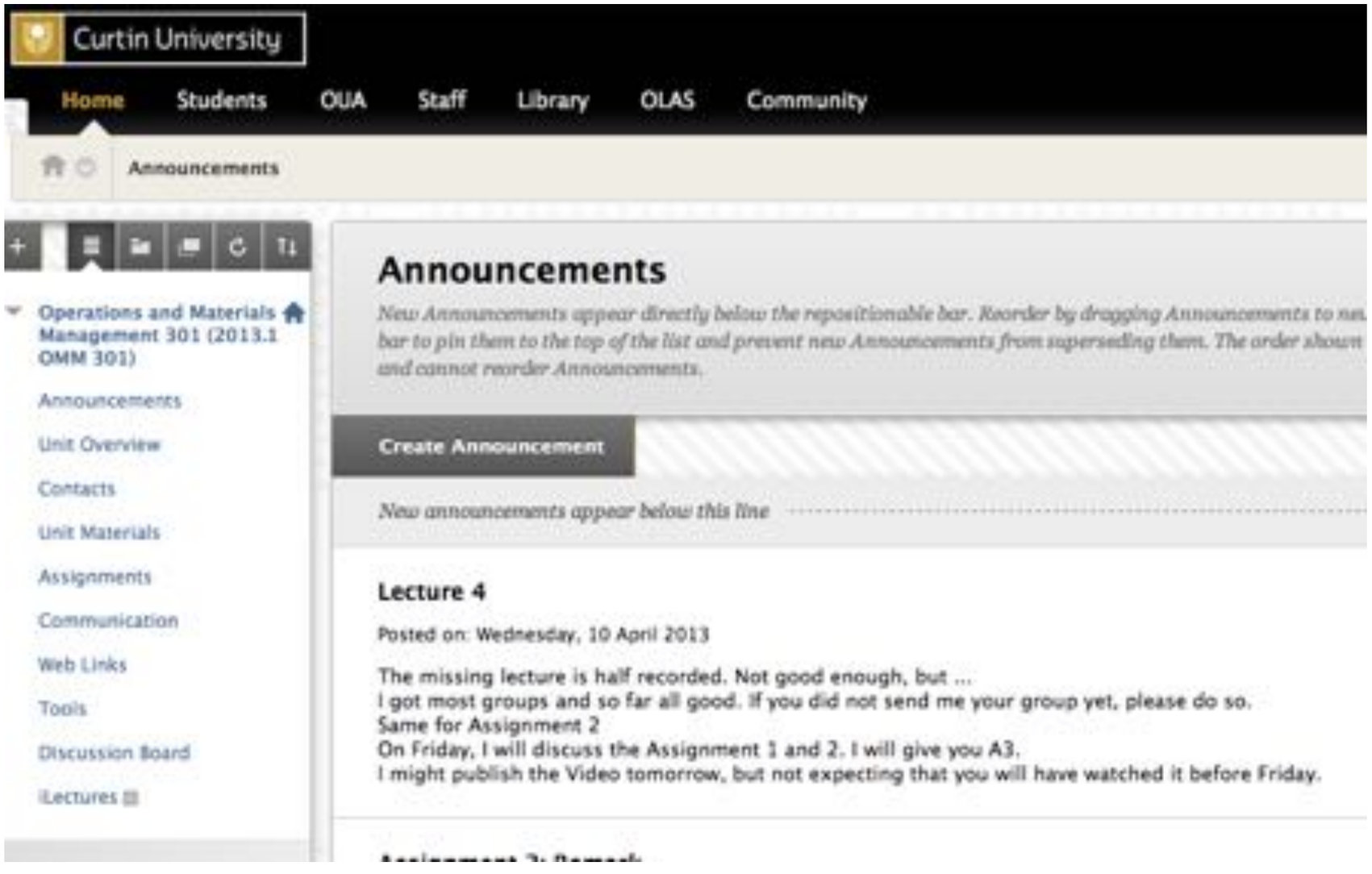
Pace University, October 2019

jond@athabascau.ca
https://jondron.org/
@jondron

CC BY SA

Athabasca University
FACULTY OF SCIENCE & TECHNOLOGY
School of Computing & Information Systems

Is there a learning technology in this picture?



Is there a learning technology in this picture?

Is there a learning technology in this picture?

Is there a learning technology in this picture?

Is there a learning technology in this picture?

What is *a* technology?

tech·nol·o·gy/tekˈnäləjē/

Noun:

1. The application of scientific knowledge for practical purposes, esp. in industry: "computer technology"; "recycling technologies".
2. Machinery and equipment developed from such scientific knowledge.

Synonyms:
technics · engineering - technique

"Anything invented after you were born" (Kay)

"Everything that doesn't work yet" (Hillis)

"Ways that people get complicated things done" (Bessant & Francis)

"A combination of artefacts and what you do with them" (Nye)

"Tools with a context" (Papert)

"Not a thing but a verb" (Kelly)

"The way things are done around here" (Franklin)

tech·nol·o·gy/tekˈnäləjē/

“the orchestration of phenomena to some use”

W. Brian Arthur

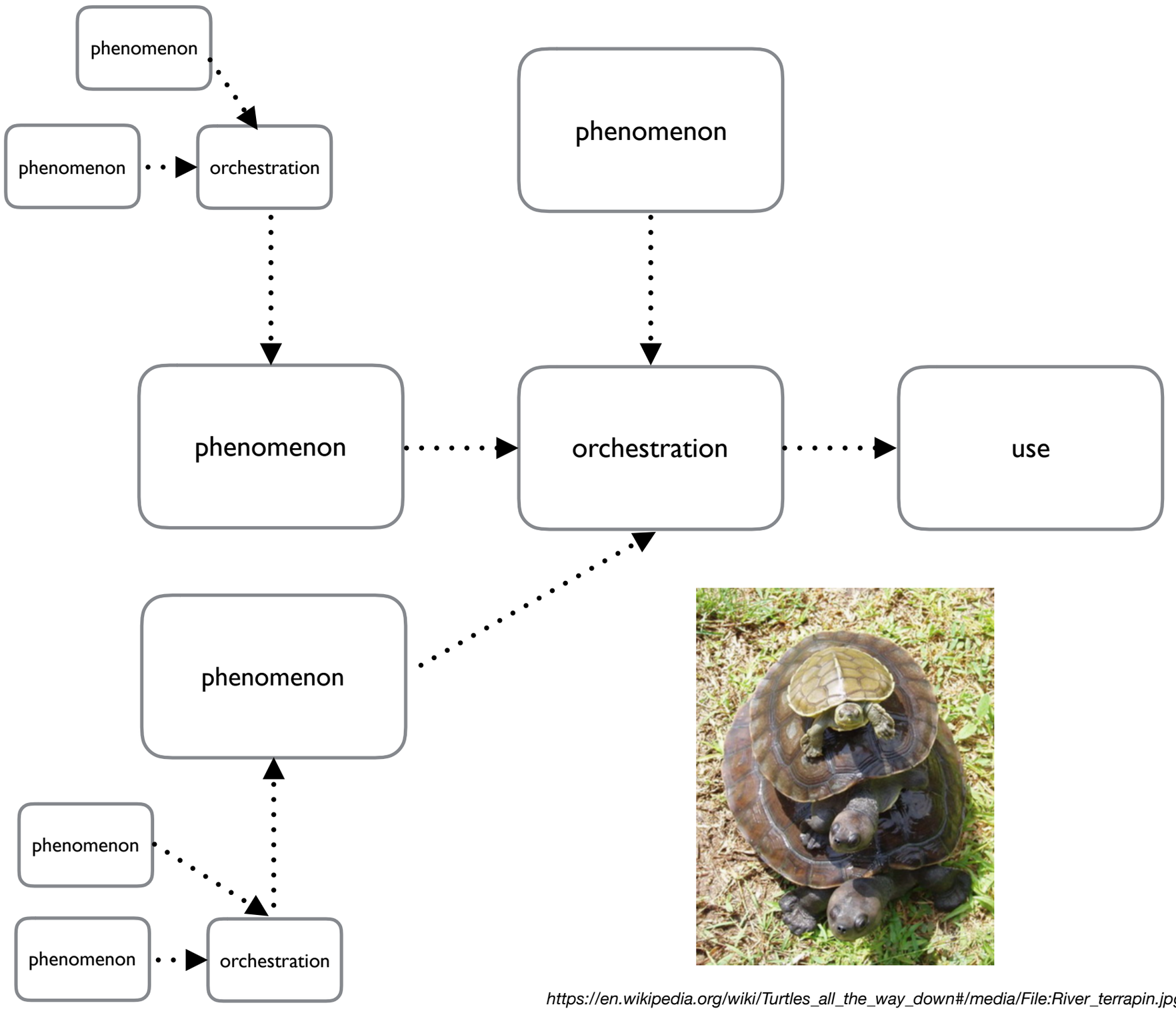
Arthur, W. B. (2009). *The Nature of Technology: what it is and how it evolves*. New York, USA: Free Press.

Technologies are assemblies

technologies are made of technologies

technologies are orchestrated assemblies

it’s turtles all the way down



https://en.wikipedia.org/wiki/Turtles_all_the_way_down#/media/File:River_terrapin.jpg

Arthur, W. B. (2009). *The Nature of Technology: what it is and how it evolves*. New York, USA: Free Press.

Hard technologies

Orchestration of phenomena embedded in the technology

May need skill to use them *correctly*

Soft technologies

http://commons.wikimedia.org/wiki/File:François_Barraud_-_Palette_et_Pinceaux.jpg

Active orchestration of phenomena by users

Skill needed to use them *well*

harder

softer

continuum

ease of use

speed

accuracy

.is easy

.is hard

control

creativity

diversity

hard

soft

replicability

precision

flexibility

resilience

continuum

pre-orchestrated

orchestrated at run-time

Baby Bear's bed

Steel, Flora Annie. *English Fairy Tales*. Arthur Rackham, illustrator. New York: Macmillan Company, 1918.

pedagogies are

soft technologies

(for teachers)

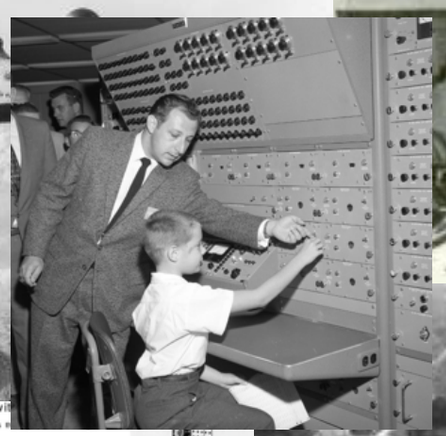
points of view

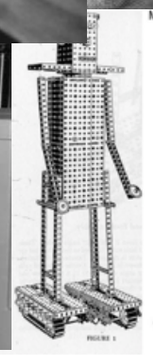
Image by Jules Feiffer, from The Phantom Tollbooth, by Norton Juster

learning technology

technology that includes pedagogical method(s)* in its assembly

* “pedagogies” for short




Models Built wit

The Set that Builds

Instructions for Building
The Mysterious Walking Robot Model

For many years, scientists all over the world have tried to build a robot or walking man. Now with your 020 Erector set or by purchasing enough additional parts to your smaller set, you can build a walking man.

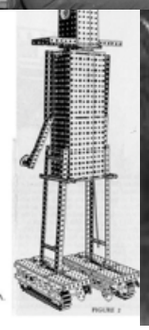
Before starting to build the model you should become familiar with the various Erector parts and methods of assembly. The numbers (CH, AA, C, B, A, etc.,) referred to in this description and on the diagrams are called trade numbers. Trade numbers and pictures of the parts can be found in the index of your Erector manual.

Figure 1 shows the front view of the completed model. Figure 2 shows the rear view of the model. Study these, as well as all the other views very carefully.

As in all construction and model building it is best to start with small assemblies and build up to the final, completed model.

The first sub-assembly to build is shown in Figure 3.

THE A. C. GILBERT CO., NEW HAVEN, CONN., U.S.A.



anyone/anything can be part of that assembly

especially (and *always* primarily) the learner

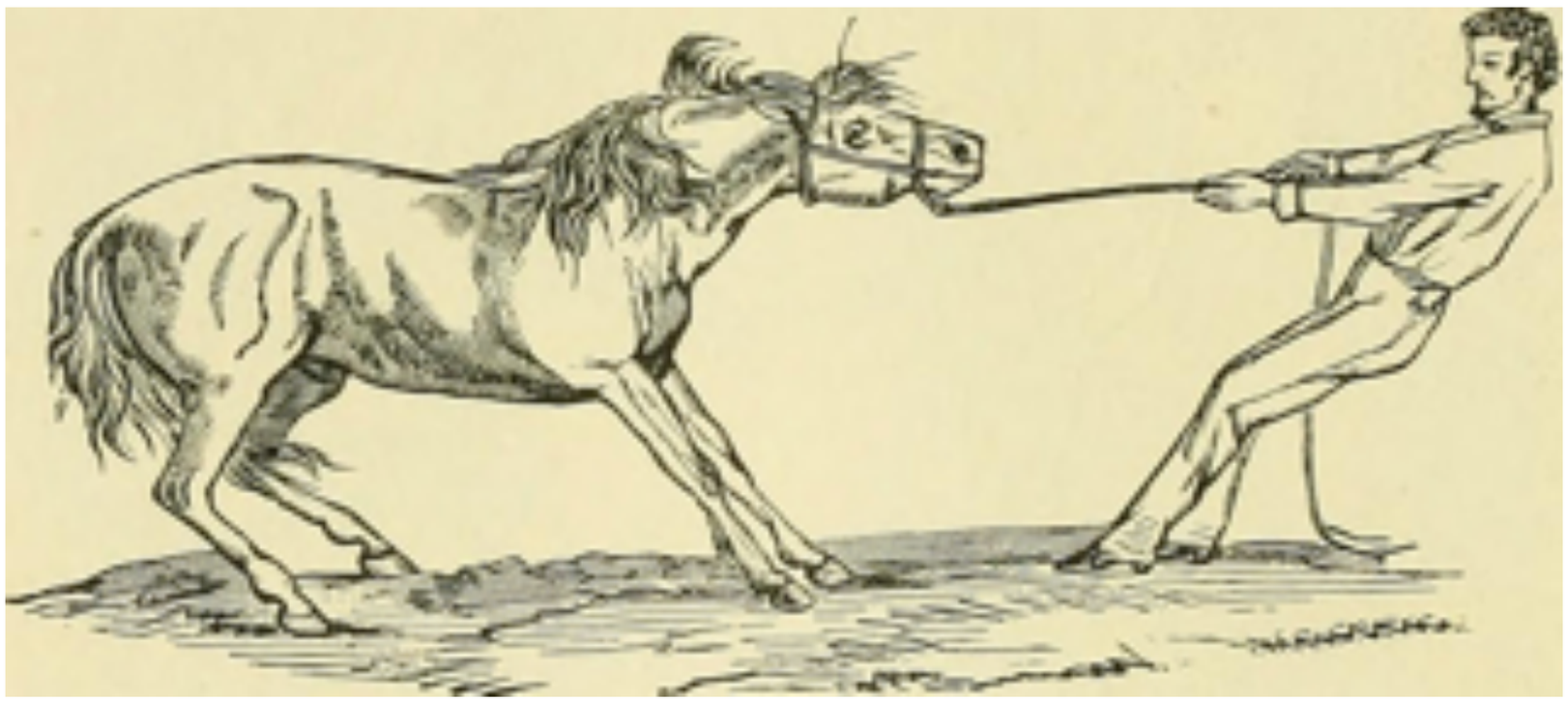
It makes no more sense to investigate the effects of computers on learning than to investigate the effects of nuts and bolts on learning.

What matters is the assembly.

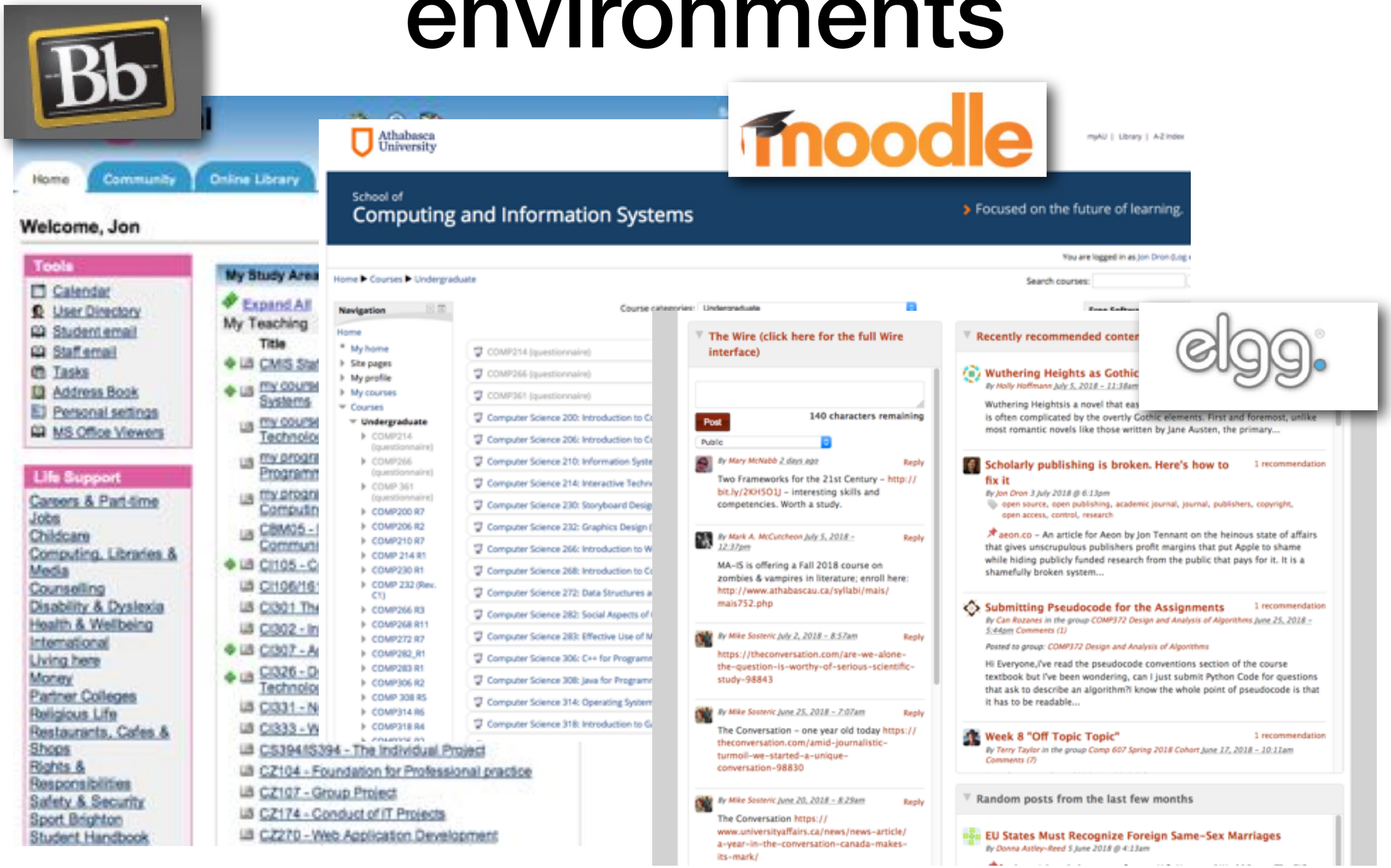
but…

the mode matters

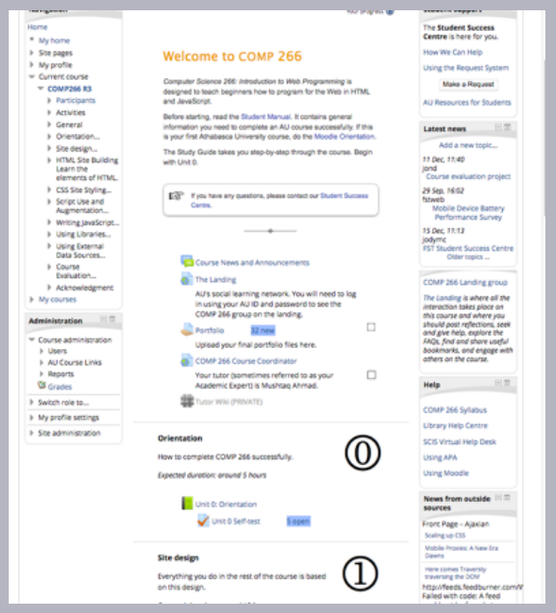
Why do we not ban cellphones in online classrooms?



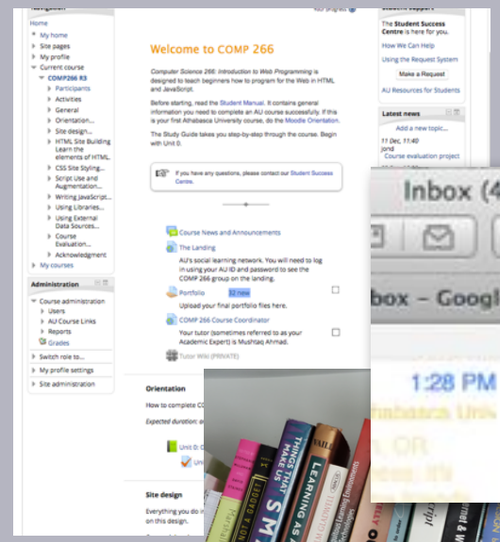
these are *not* learning environments

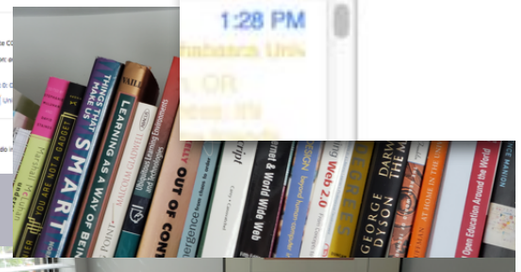


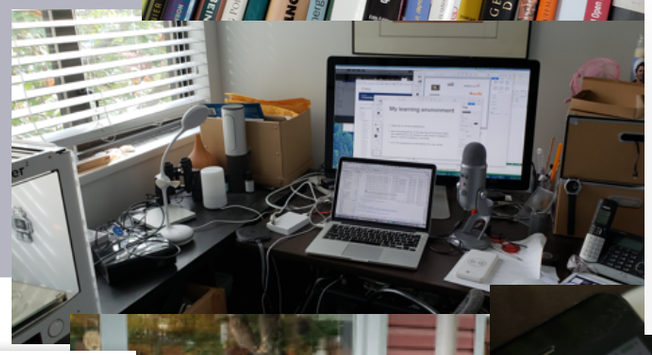
The teaching environment

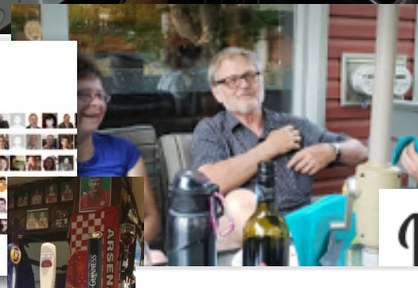


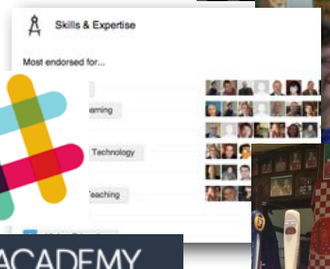
The learning environment

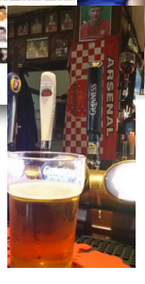


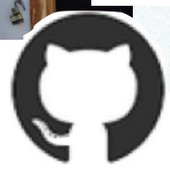


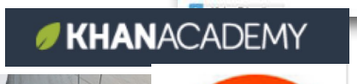


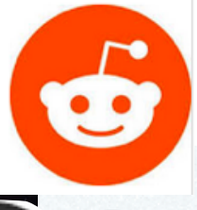




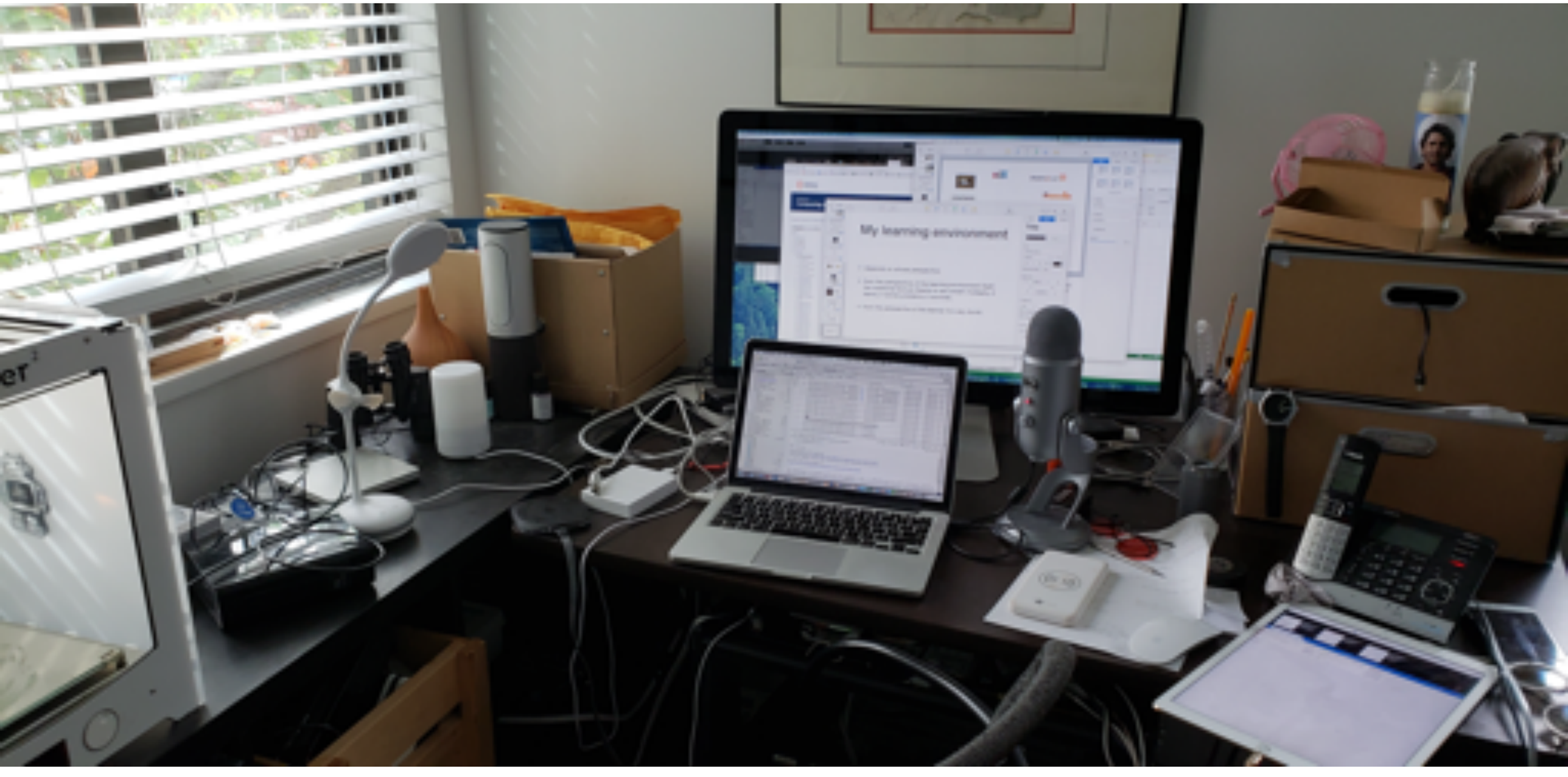






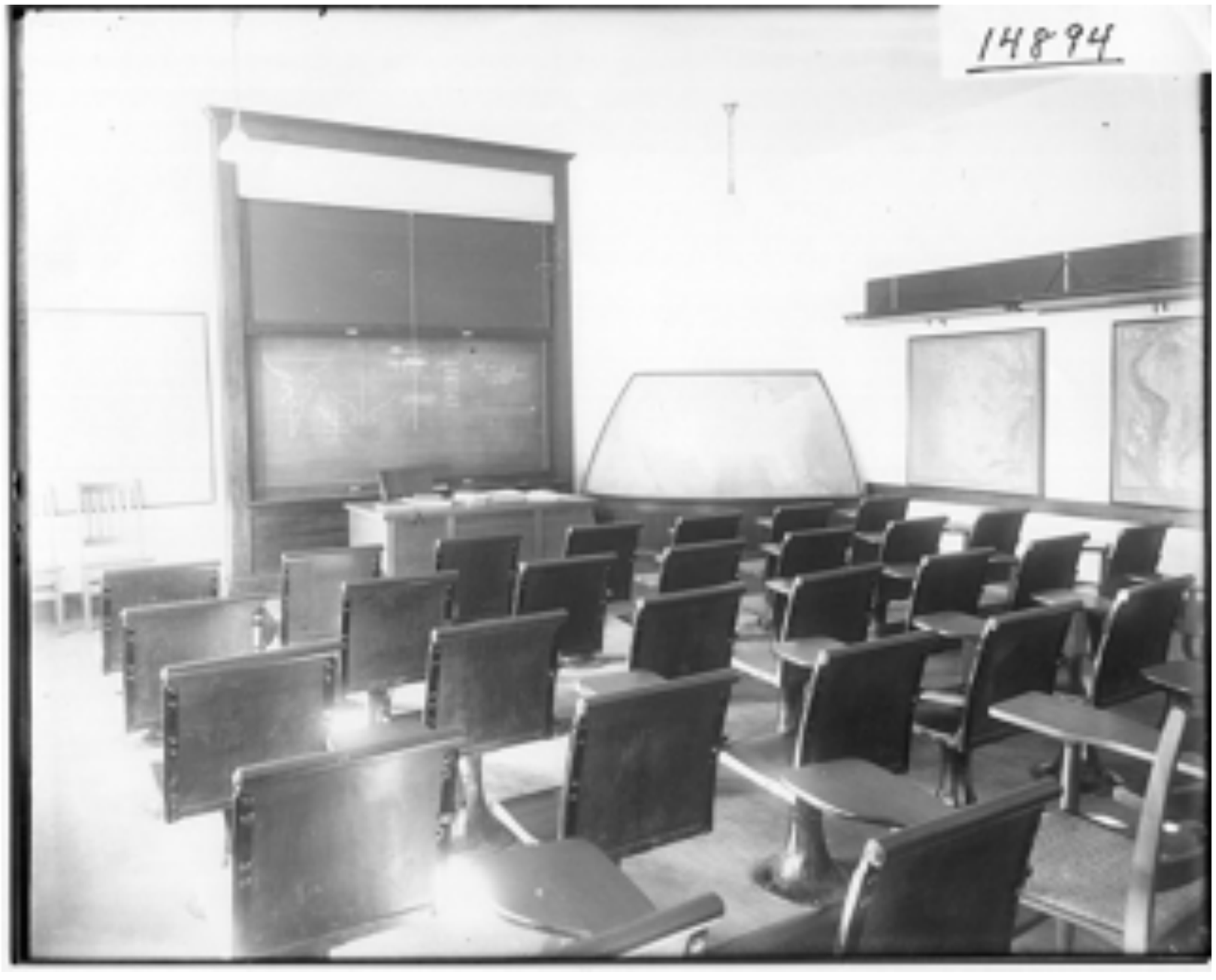


(part of) my learning environment



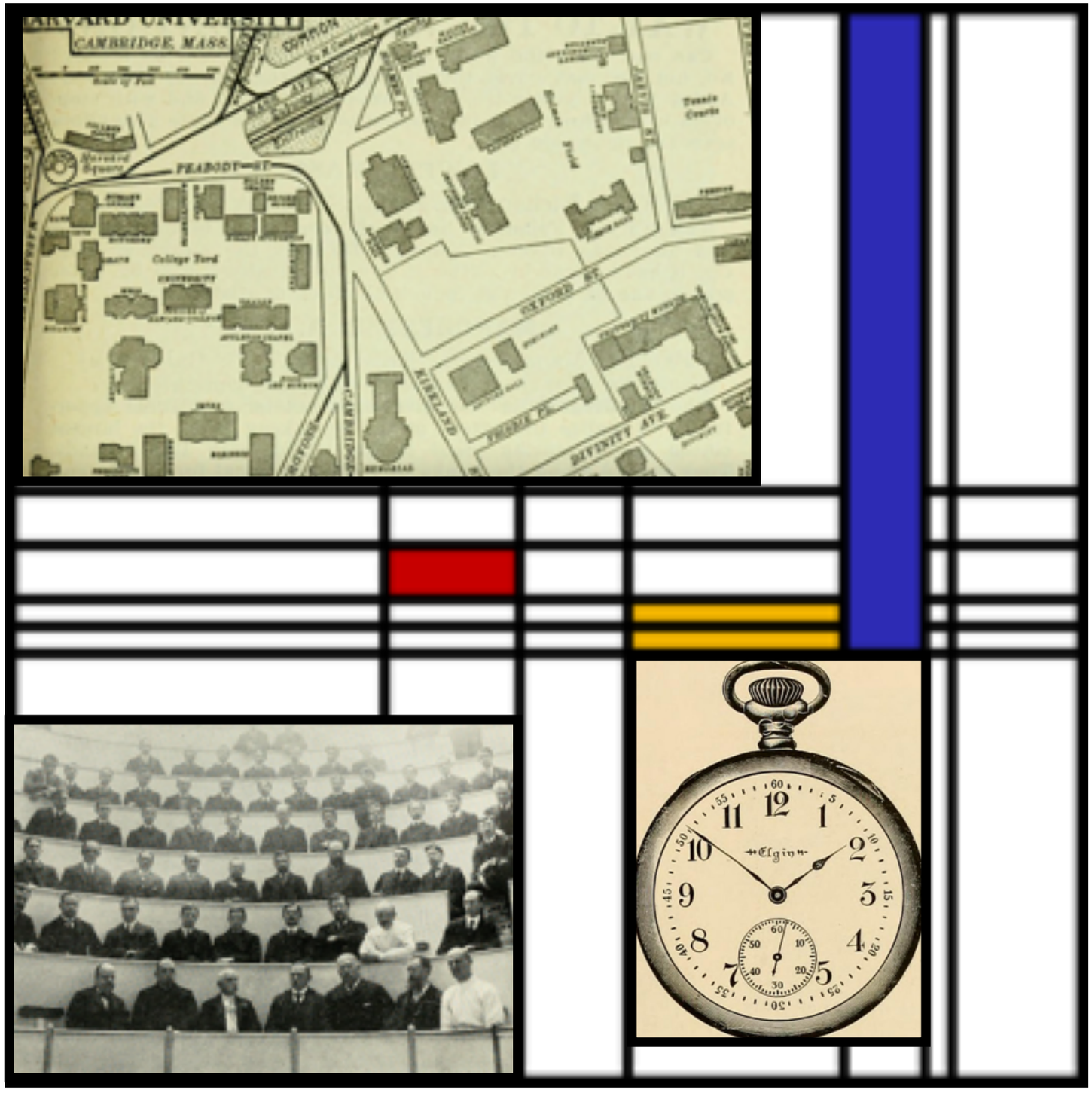
but...

this *is* a learning environment



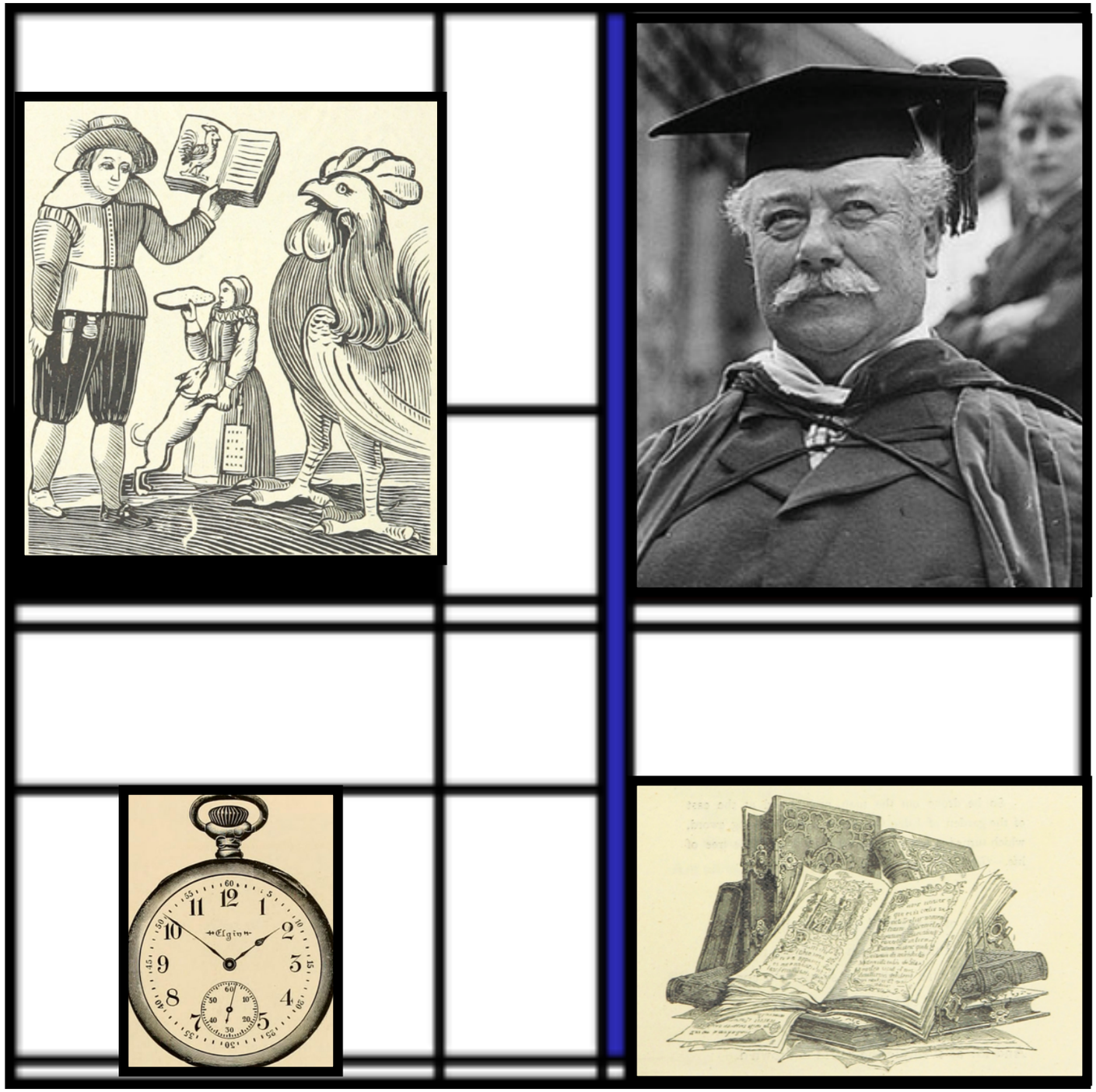
Traditional in-person pedagogy is a solution to…

Physical boundaries



Traditional in-person pedagogy is a solution to…

Scarce resources



classes

faculties

semesters

terms

schools

universities

tests

textbooks

accreditation

timetables

assignments

exams

seminars

What follows…

convocations

lectures

courses

programs

tutorials

learning outcomes

curricula

rules & regulations

libraries

desks

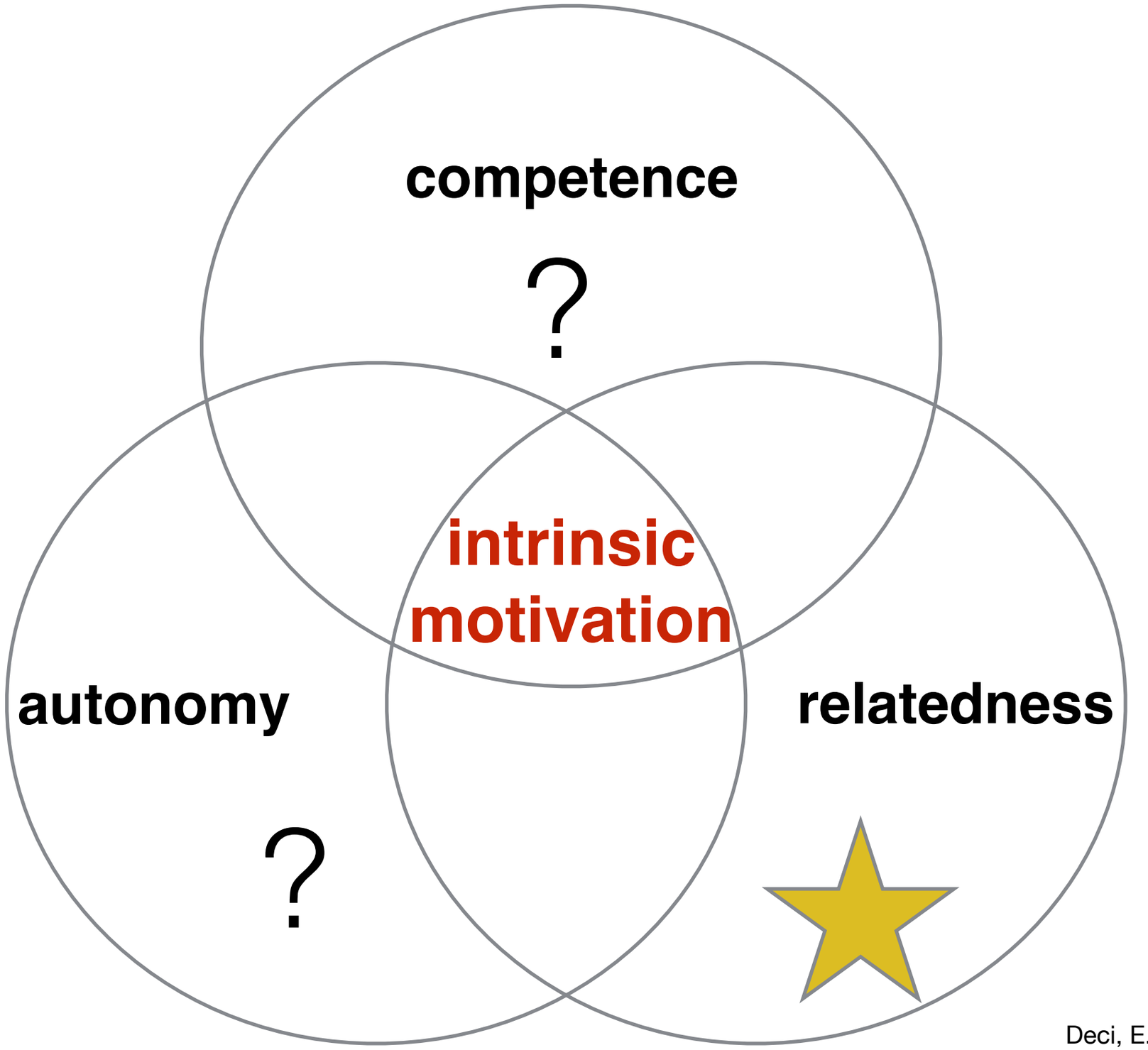
and, most importantly…

people that *do not want to be there*

a context that is *by definition*

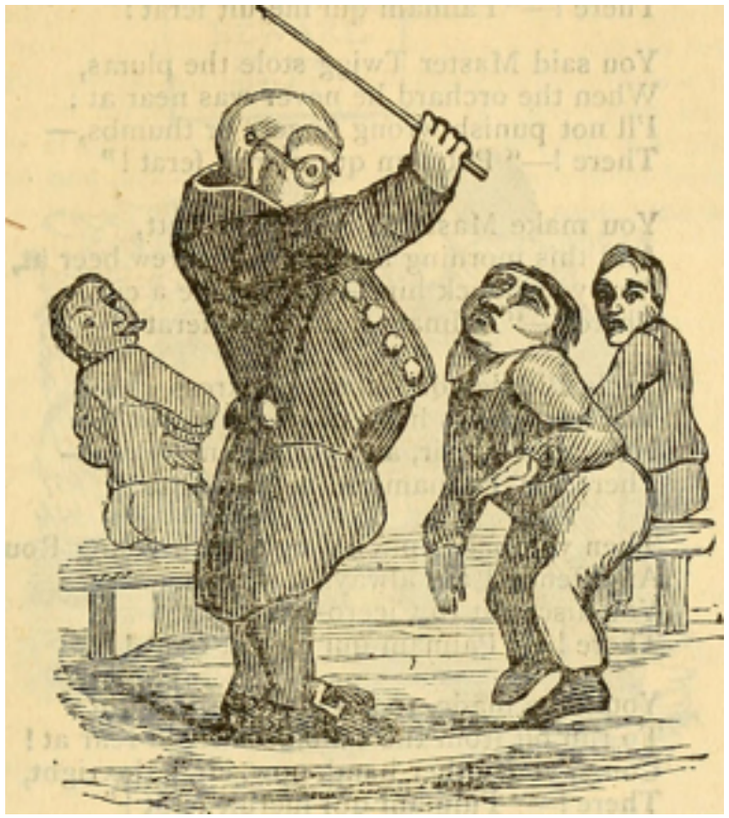
demotivating

Classroom motivation



http://selfdeterminationtheory.org

Deci, E.L., & Ryan, R.M. (2000). The “What” and “Why” of goal pursuits: Human needs and the self-determination of behaviour. Psychological Inquiry, 11, 227-268



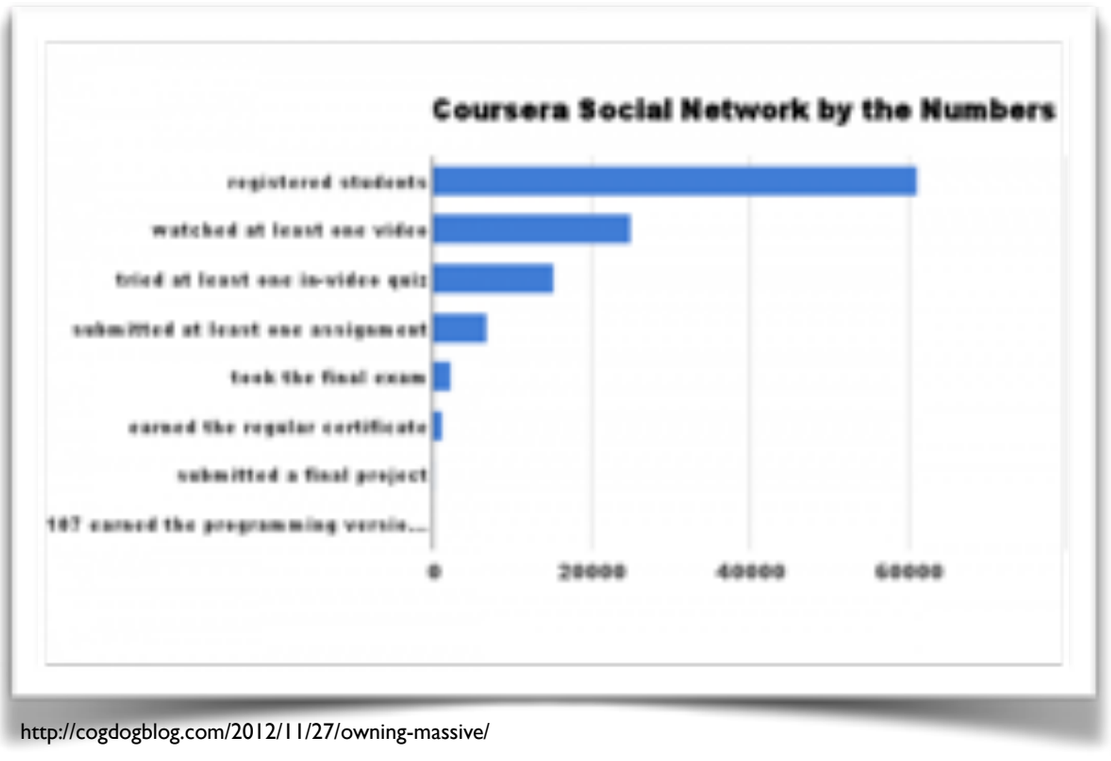
sticks and carrots

Extrinsic motivation crowds out Intrinsic motivation

The reward, or avoidance of punishment, becomes the purpose (and *stays* that way)

http://selfdeterminationtheory.org/

What happens when you take away the power of the teacher (but keep the same pedagogies)?



http://cogdogblog.com/2012/11/27/owning-massive/

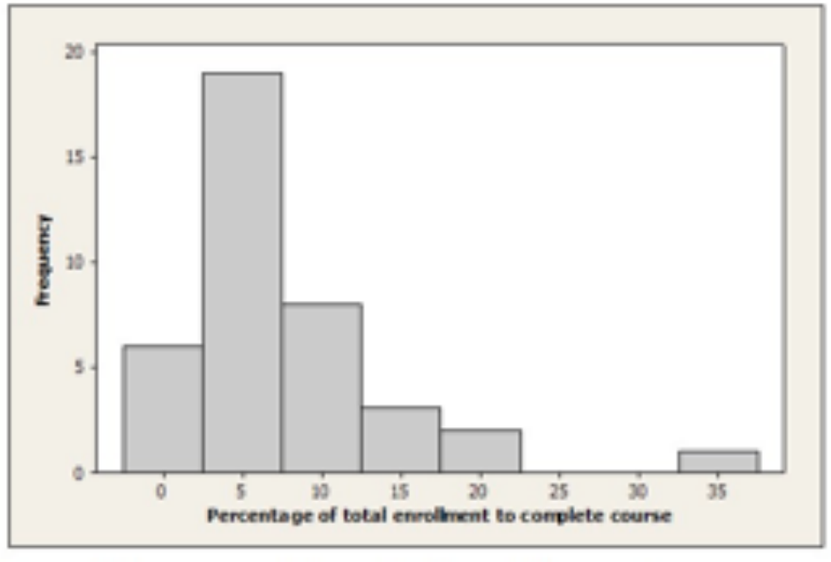
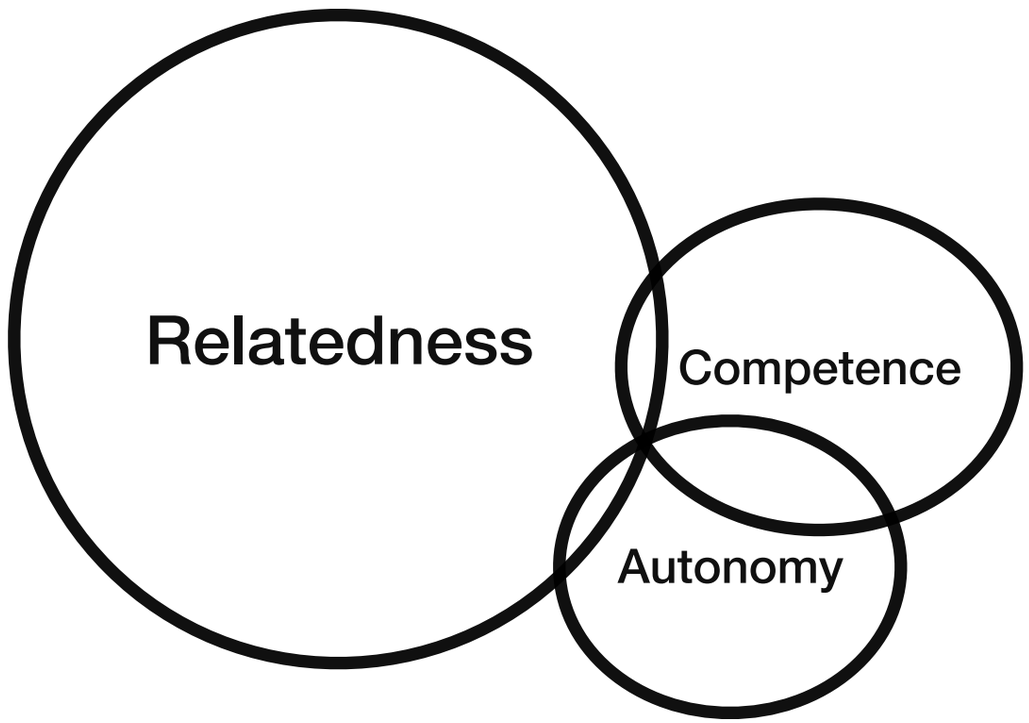


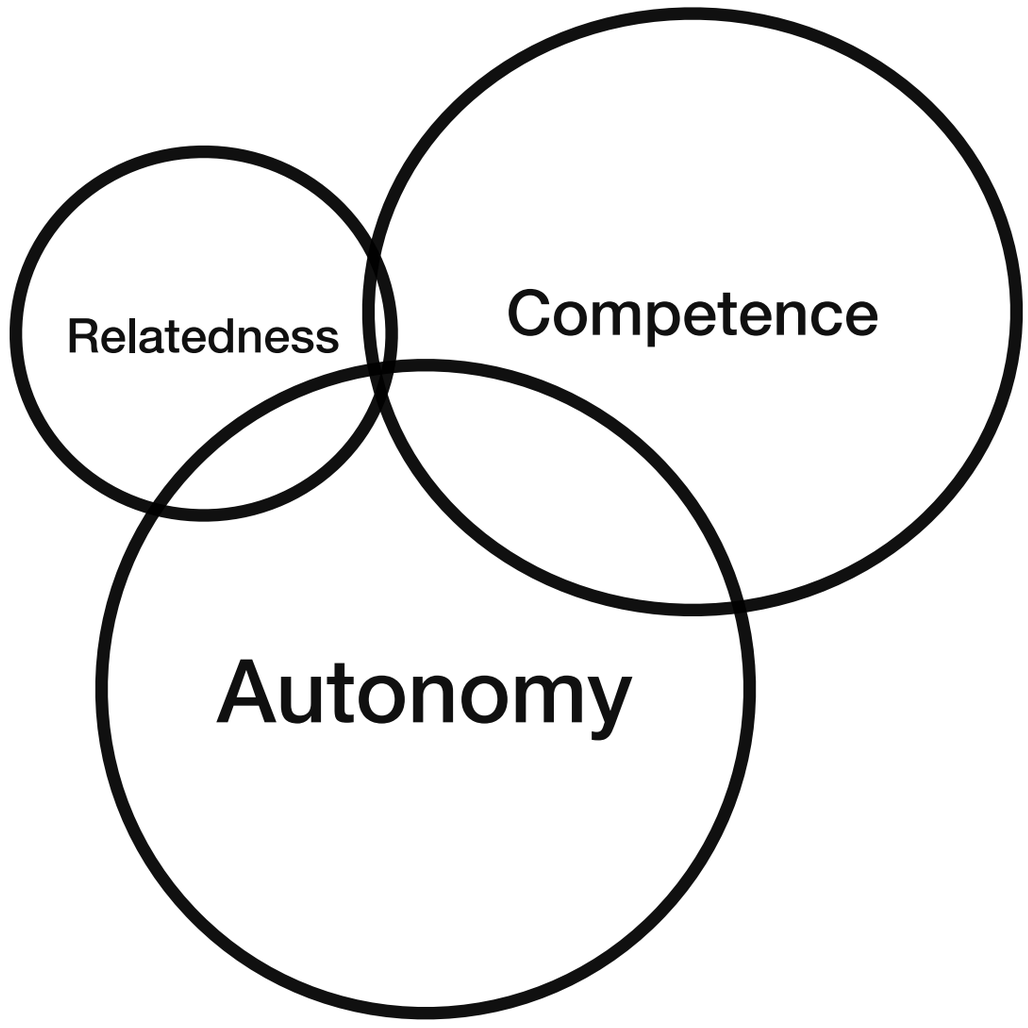
Figure 4. Histogram of completion rates for the sampled courses (n = 39).

"Completion rates range from 0.9% to 36.1%, with a median value of 6.5%"

Katy Jordan, 2014: http://www.irrodl.org/index.php/irrodl/article/view/1651/2774



in-person learning



distance learning

Motivation in classrooms vs motivation online

Good institutional pedagogy:

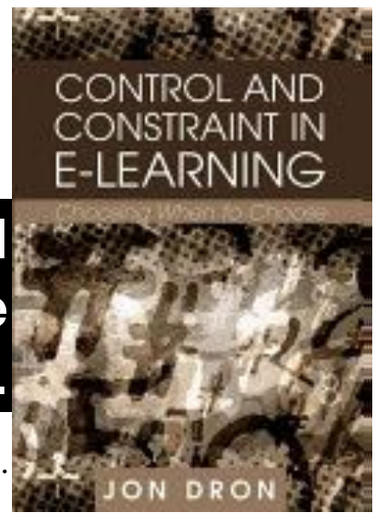
- puts learners in control*

- supports the challenged, and challenges the unchallenged

- leverages the social

Direct Instruction
Active Learning
inquiry-based learning
problem-based learning
Mastery Learning
reflective practice
project-based learning
learning portfolios
scaffolding
Anchored Learning
experiential learning
debate
case-based learning
situated learning
Communities of Inquiry
social construction
Cognitive Apprenticeship
flipped classrooms

*IMPORTANT: choice alone is not equal to control: we must be able to choose *not* to choose.



Dron, J. (2007). *Control and Constraint in E-Learning: Choosing When to Choose*. Hershey, PA: Idea Group International.

but

everything works (especially Direct Instruction)

Hattie, J. (2013). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. Taylor & Francis.

but

most pedagogical methods are solutions to problems created by the classroom context

how many make sense outside the classroom?

education is technology, not science

Tain’t what you do…

…it’s the way that you do it

That’s what gets results

What’s the first thing you do when you want to learn something?

me too

+

YouTube CA duolingo Elements of AI Makerspaces .com reddit edutopia Quora KHANACADEMY Slashdot stackoverflow facebook CANADA LEARNING CODE etc, etc, etc

61,503 views | Oct 22, 2019, 09:47am

The End Of College Is Coming

Stephen McBride Contributor

Markets

The editor of RiskHedge Report

The New York Times

Why This Tech Executive Says Her Plan to Disrupt Education Is Different

DISRUPTION in Education

25 Trends Disrupting Education Right Now

October 31, 2017 in The Future Of Learning 4 min read

Trending

What Is Bloom Definition For "

University education is ripe for disruption

STEPHEN ELOP AND ISHWAR PURI

CONTRIBUTED TO THE GLOBE AND MAIL

PUBLISHED MAY 12, 2019

Education has already been disrupted (despite appearances to the contrary)

(but *not* like this edX Future Learn UDACITY coursera OPEN 2 STUDY EDUCATION BILL & MELINDA GATES foundation **!)**

Credentials have not (and will not be any time soon)

native distance learning

Spot the teacher

Spot the teacher

learners

schools

authors

buildings

librarians

buttons

sys admins

universities

editors

designers

timetables

rules

legislators

playgrounds

lecture halls

TVs

books

doorknobs

desks

artists

instructional designers

directors

researchers

cooks

postal workers

The teaching gestalt

pens

tweets

games

committee structures

hashtags

interfaces

architects

Wikipedia editors

technicians

LMSs

actors

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chairs

indexes

photographers

cleaners

bloggers

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programmers

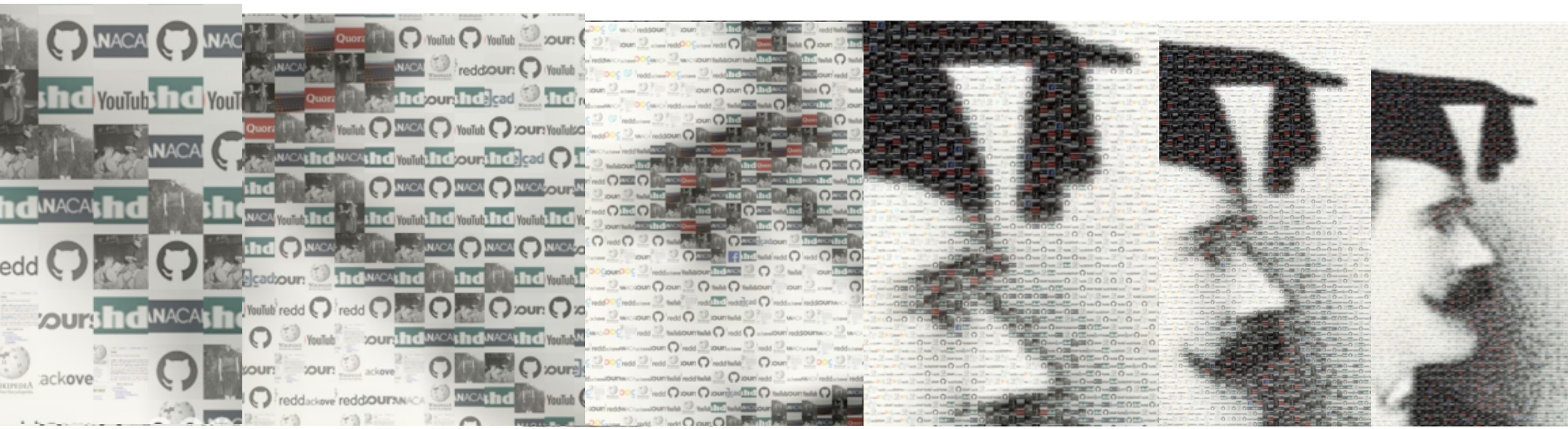
governments

exam boards

teachers

films

clothing designers

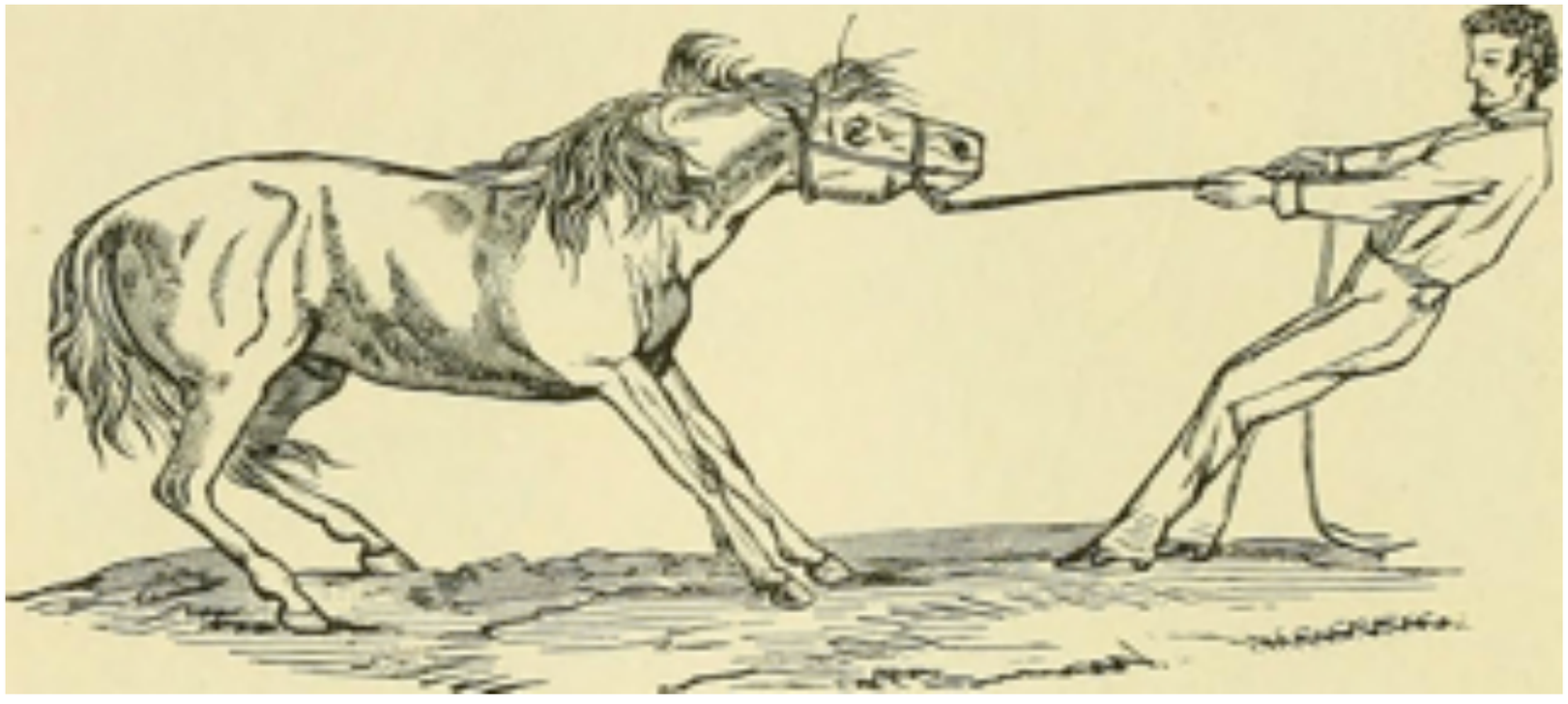


the teaching gestalt

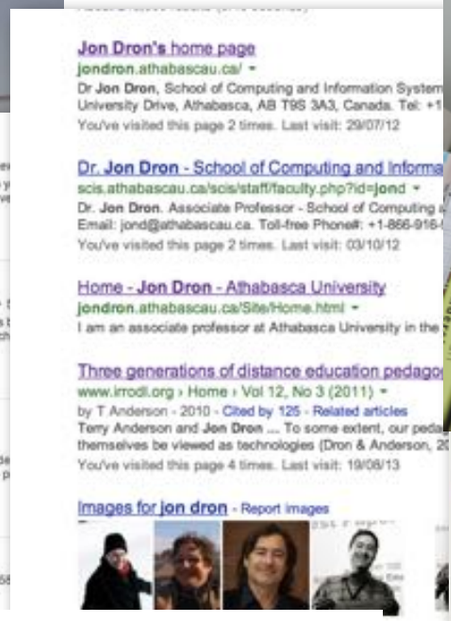
Online, we swim in a sea of teachers

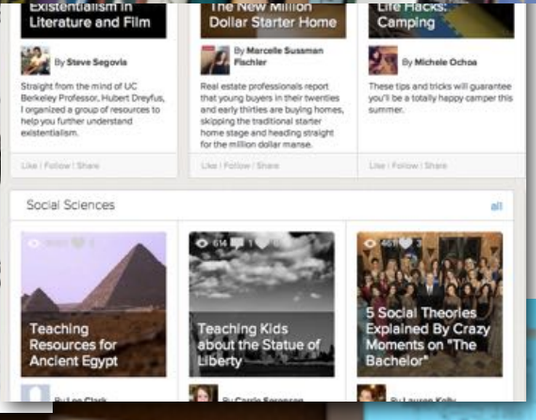
What is teaching like when you let go…

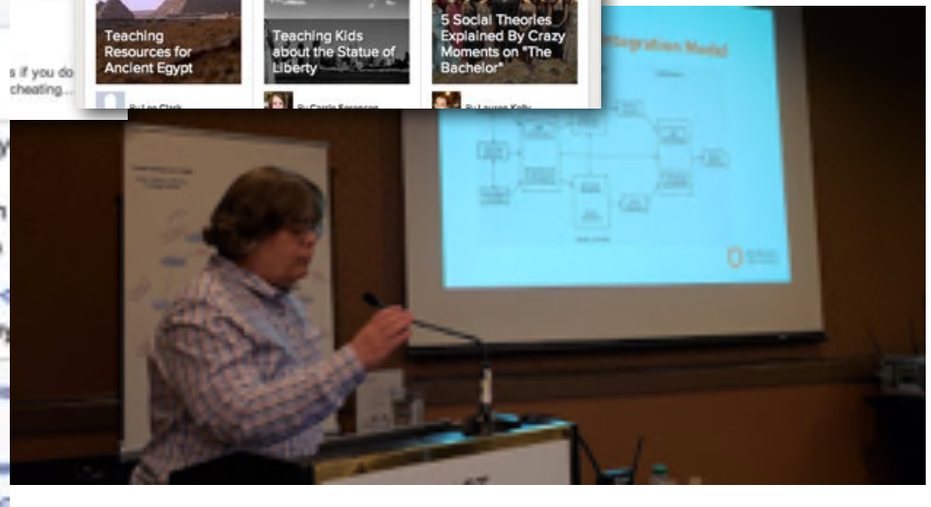
…and when you have no means of coercion?



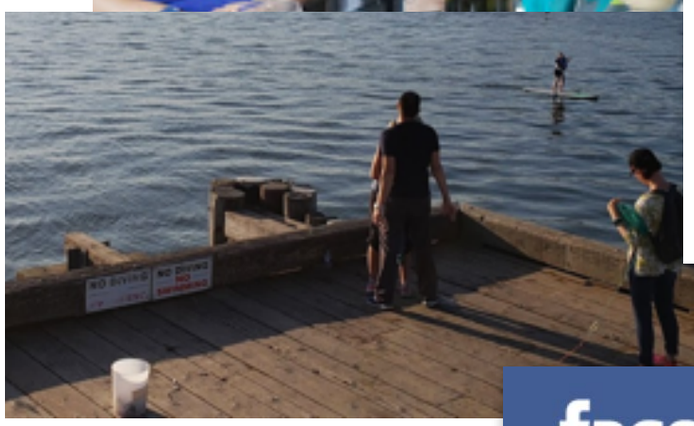
Distributed content

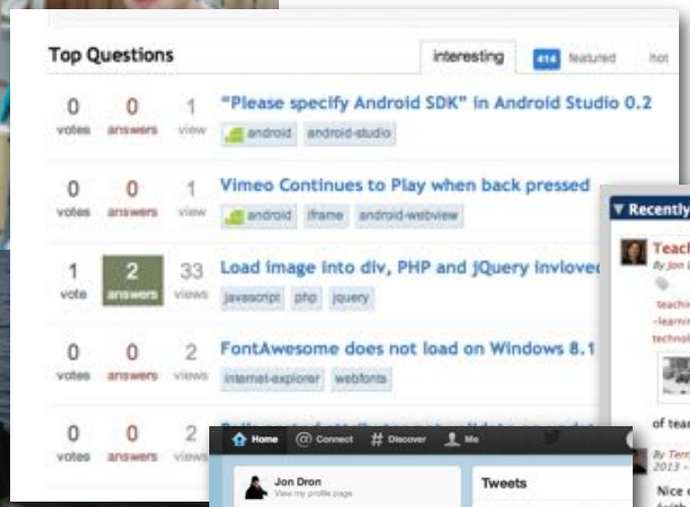


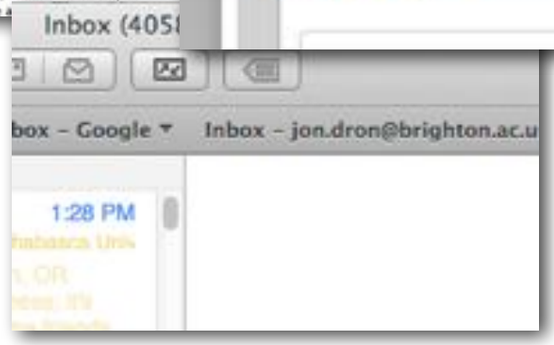


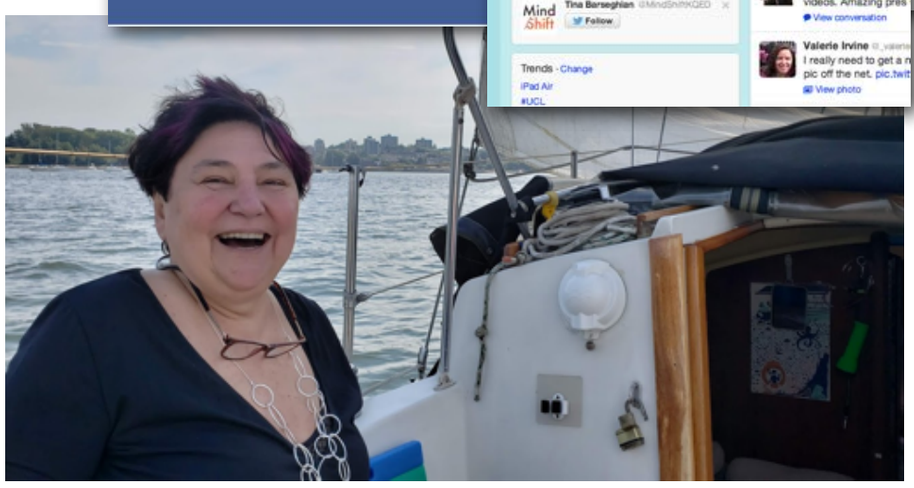


Distributed support

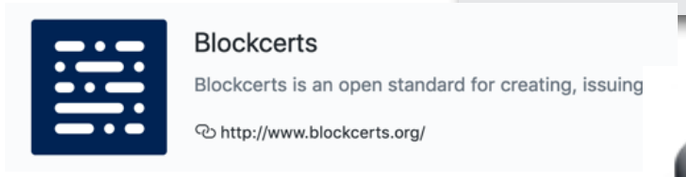


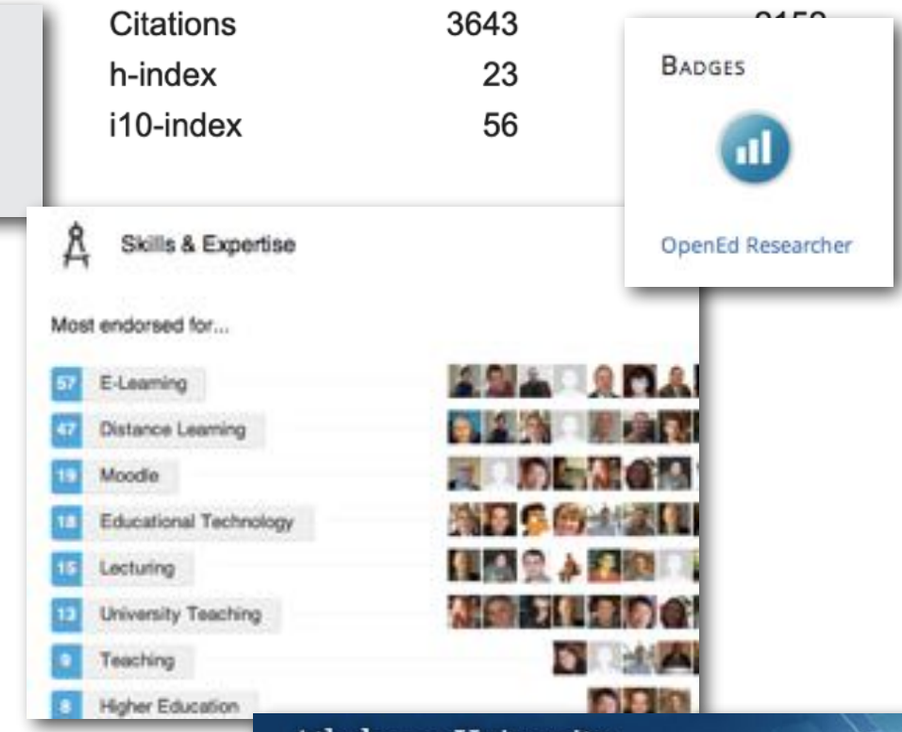


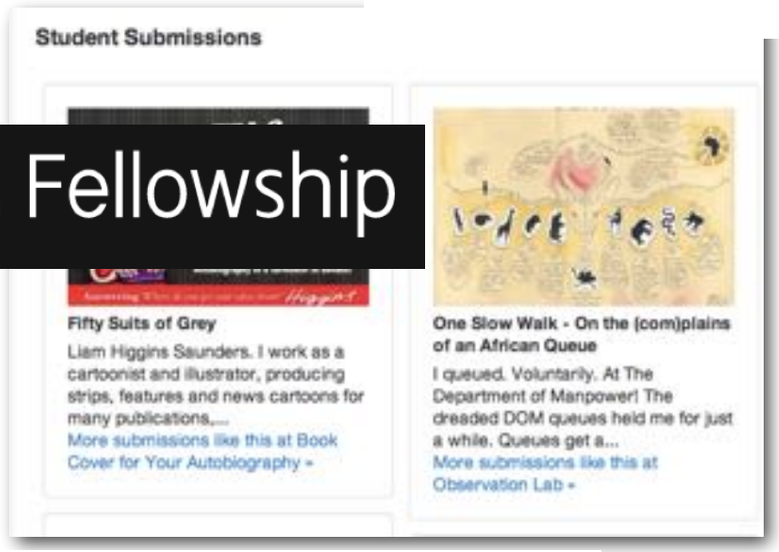




Distributed accreditation







THIEL Fellowship

Athabasca University
E-LAB PORTFOLIO

Athabasca University

Undergraduate Challenge for Credit Registration Form

Not all courses are available for challenge. Before you complete

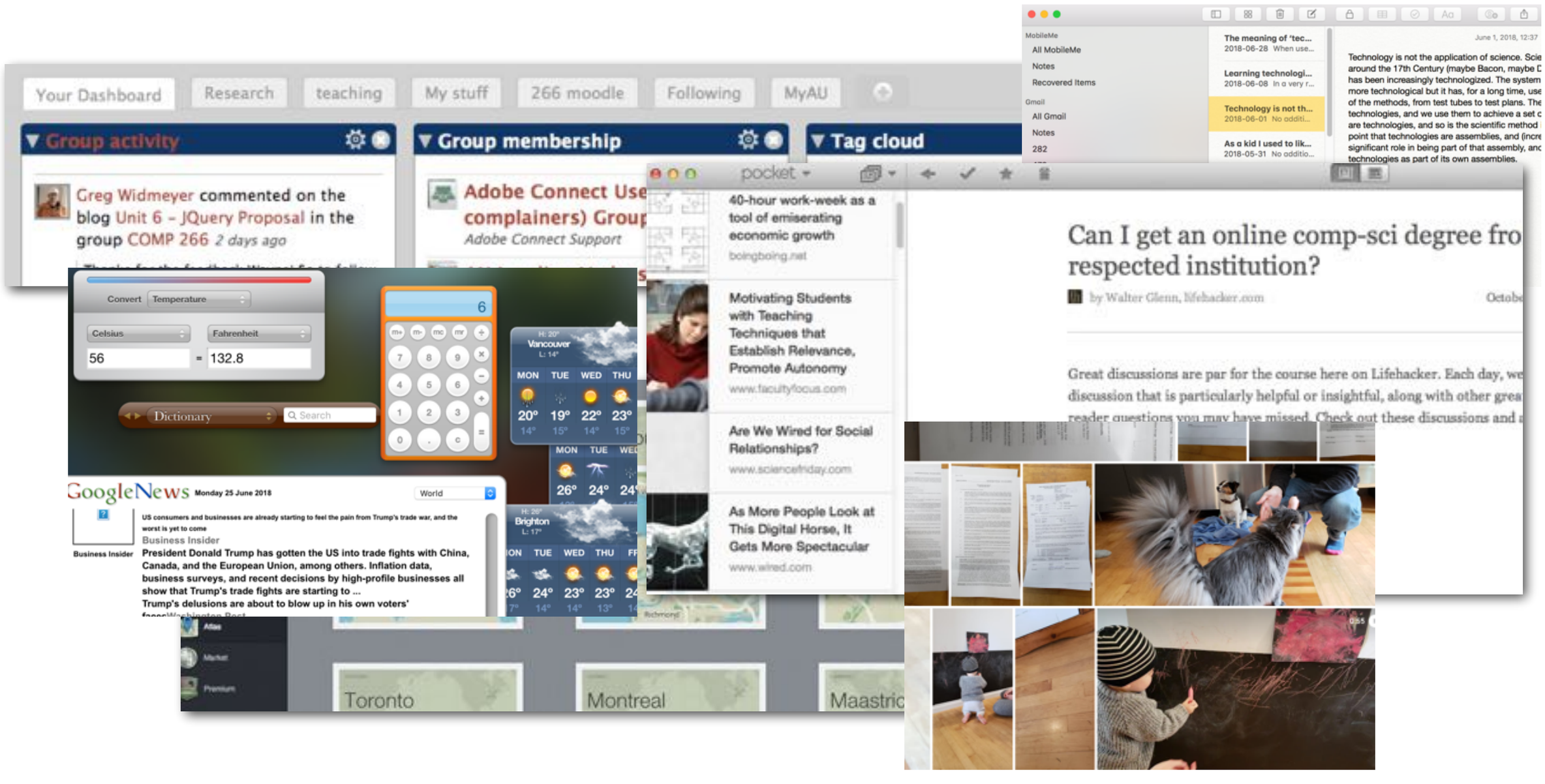
Digital Diploma debuts at MIT

Using Bitcoin's blockchain technology, the Instit

WESTERN GOVERNORS UNIVERSITY
ONLINE. ACCELERATED. AFF

Nanodegree Program

Personal sense-making



Pedagogies of the gestalt

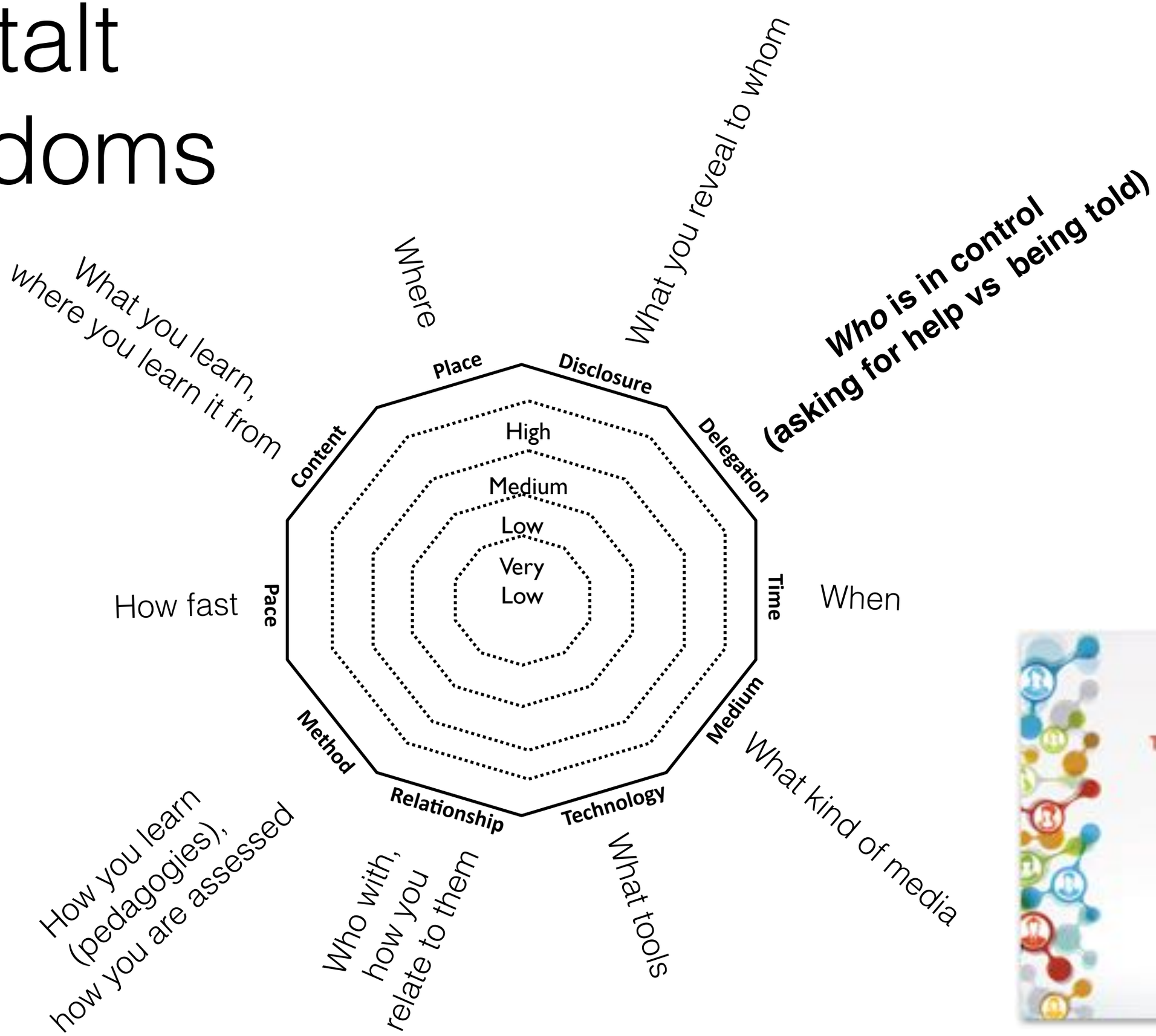
Complexivist family examples:

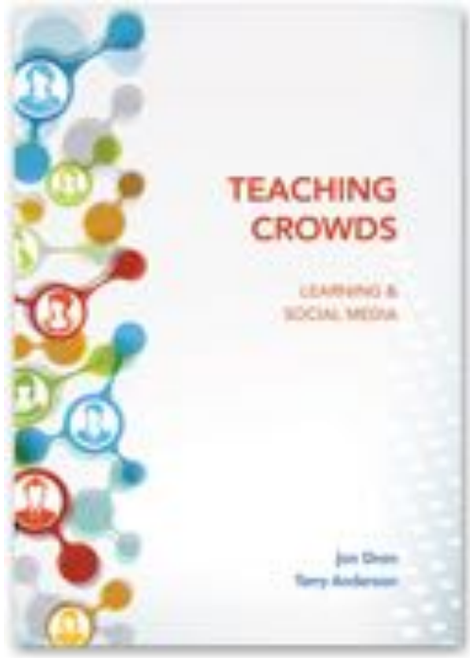
- Connectivism (Siemens, Downes)
- Distributed cognitive apprenticeship (Seely Brown)
- Rhizomatic learning (Cormier)
- Networks of practice (Wenger, Trayner & deLaat)
- Heutagogy (Hase & Stewart)
- Transactional control (Dron)

Common traits:

distributed cognition;
sense making, wayfinding, filtering, navigation;
personal but networked/networked individualism;
complex systems, emergence;
connection not consumption;
learner control;
social construction;
reification, persistent traces;
networks of people, artifacts & machines;
cooperation more than collaboration;
creation, engagement, sharing, openness

Gestalt freedoms





http://teachingcrowds.ca - Dron & Anderson 2014 - extending Morten Paulsen's theory of cooperative freedom

Leonardo's to-do list

CALCULATE

FIND

DISCOVER

GET nnn TO SHOW YOU

TALK TO

ASK

DRAW

EXAMINE

FIND A MASTER

TRY TO GET (a book)

https://www.npr.org/sections/krulwich/2011/11/18/142467882/leonardos-to-do-list

serves

builds networks/*is* a network

creates

challenges

supports

assembles

inspires

discusses

models

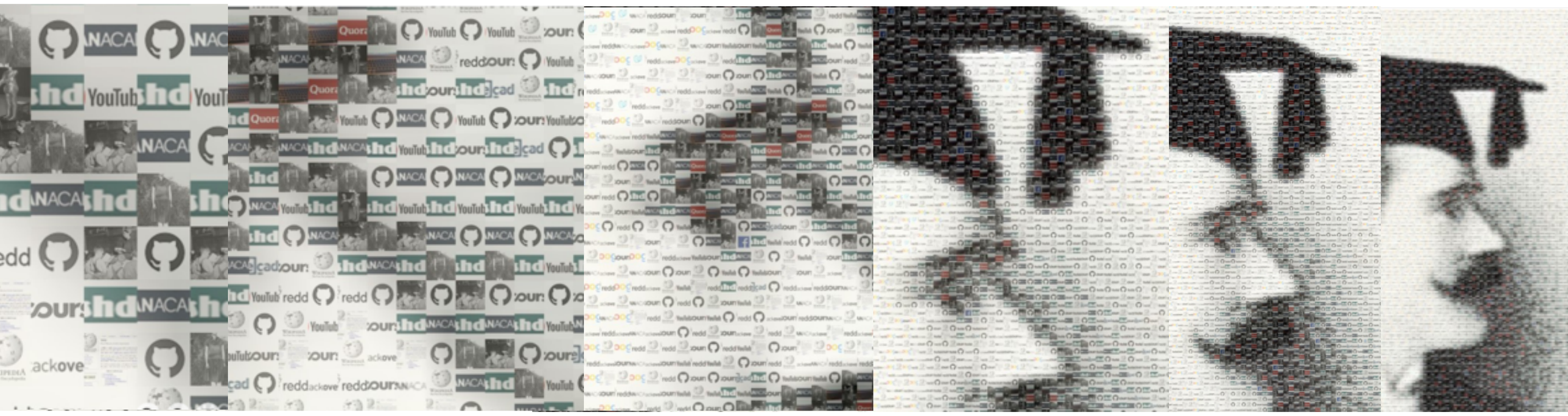
discovers

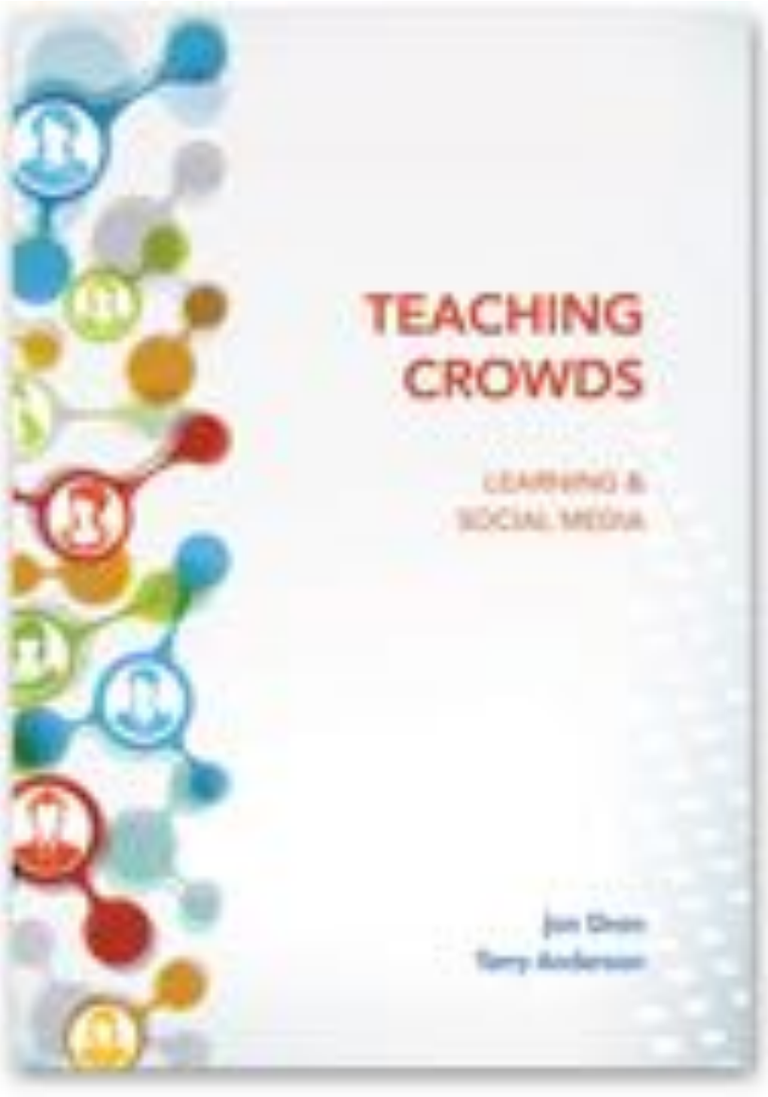
focuses

emerges

the gestalt teacher

engages connects reflects shares cares





https://teachingcrowds.ca/

Thank you

✉ jond@athabascau.ca

@jondron

https://jondron.org/