

A black dog is sitting on a wooden deck, looking out a window. The dog's back is to the camera, and its head is turned slightly to the right. The window shows a view of a green lawn, trees, and a wooden pergola. The text is overlaid on the image.

# The Next Generation of MOOCs

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National Research Council Canada

for

Iranian Conference of Health Professions Education  
(ICHPE)

May 18-20, 2022

Although only 15 years old, Massive Open Online Courses (MOOCs) have captured the imagination of online learners.

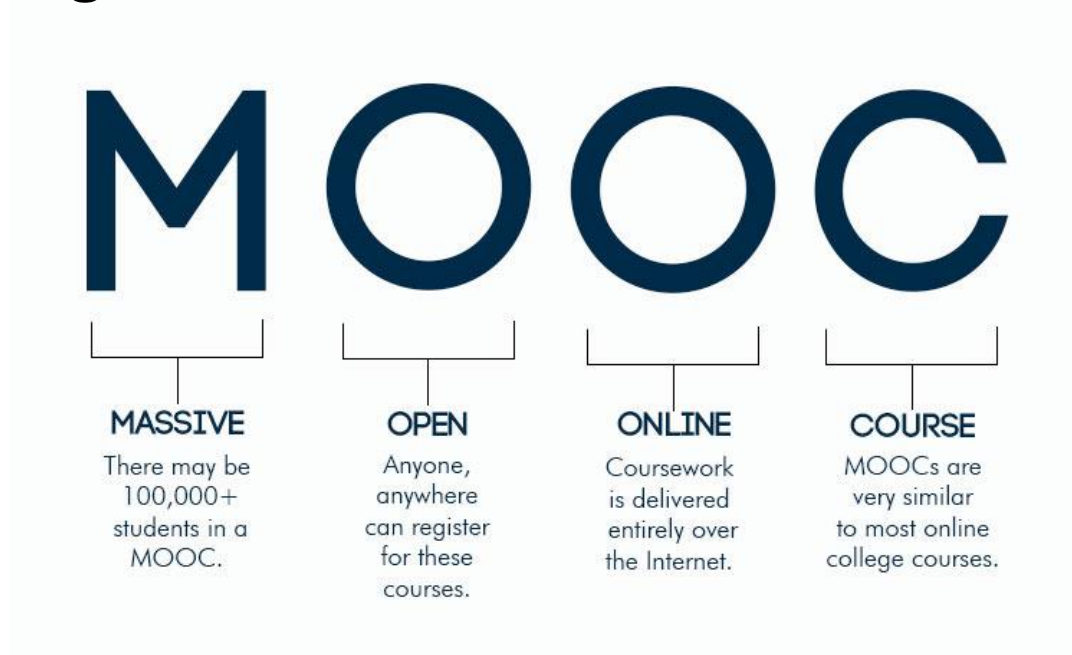
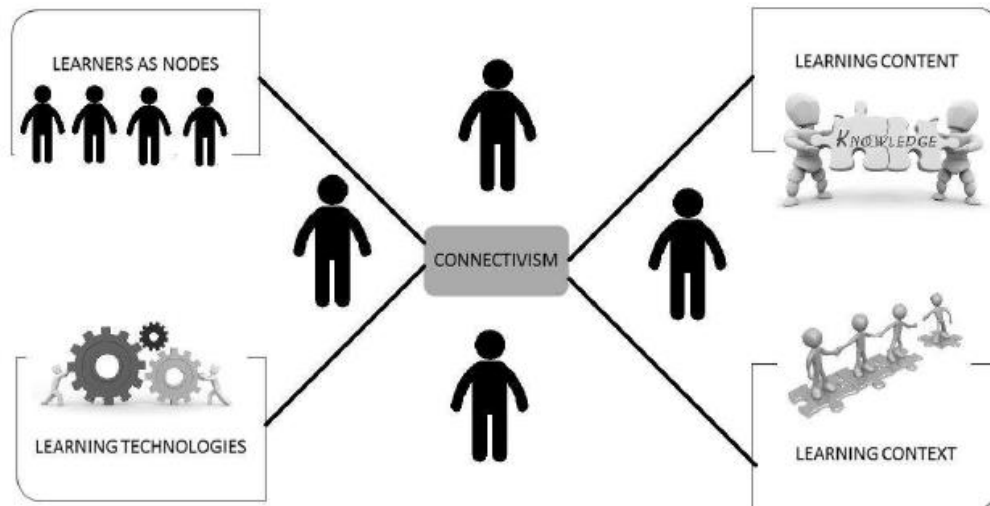


Image: <https://www.codlearningtech.org/2015/11/23/5-questions-what-you-need-to-know-about-moocs/>



The *c* in cMOOC stands for *connectivist*.



Connectivism is the thesis that knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks

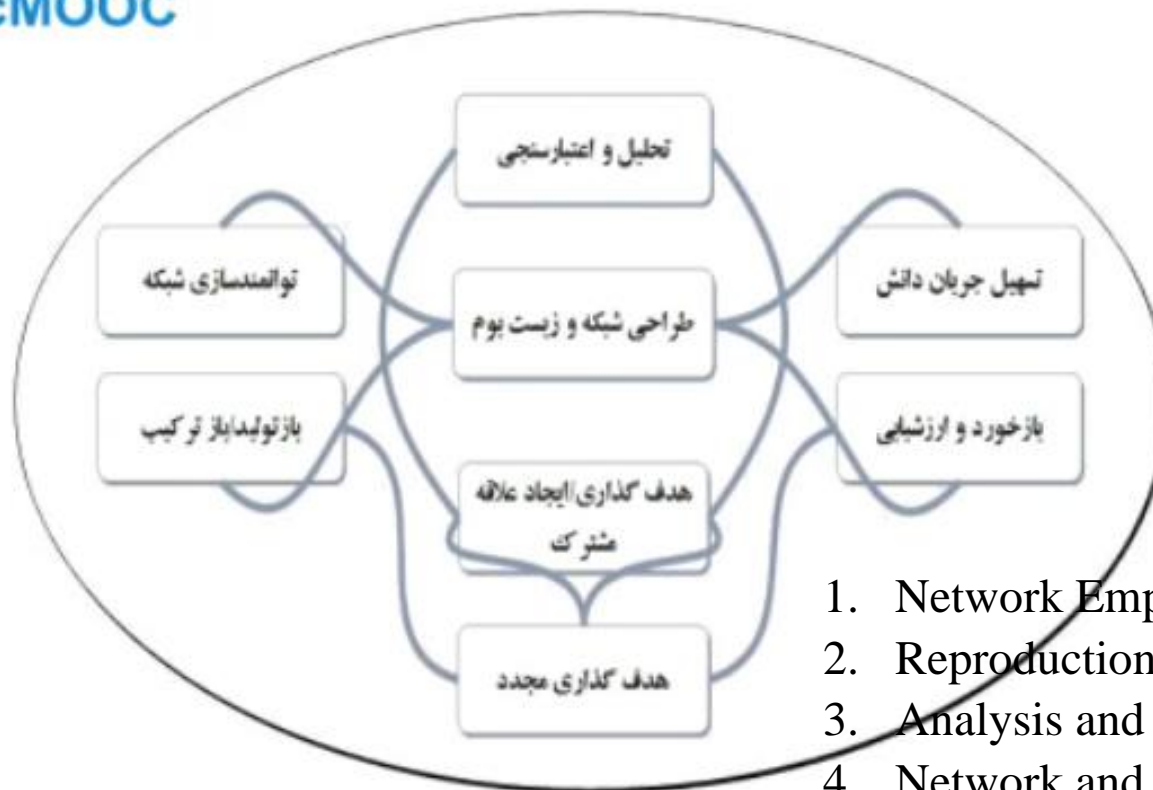
Stephen Downes, 2022, Connectivism.

<http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/623>

Image: Denzil Chetty, 2013, Connectivism: Probing Prospects for a Technology-Centered Pedagogical Transition in Religious Studies  
[https://www.researchgate.net/publication/269071838\\_Connectivism\\_Probing\\_Prospects\\_for\\_a\\_Technology-Centered\\_Pedagogical\\_Transition\\_in\\_Religious\\_Studies\\_1](https://www.researchgate.net/publication/269071838_Connectivism_Probing_Prospects_for_a_Technology-Centered_Pedagogical_Transition_in_Religious_Studies_1)

# Elements of a cMOOC

cMOOC



From a presentation by Eisa rezaei

1. Network Empowerment
2. Reproduction/ Recombination
3. Analysis and Accreditation
4. Network and Ecosystem Design
5. Targeting / Creating a Common Interest
6. Re-Targeting
7. Knowledge Facilitation
8. Feedback and Evaluation

# xMOOC

The **x** in xMOOC stands for **eXtended**

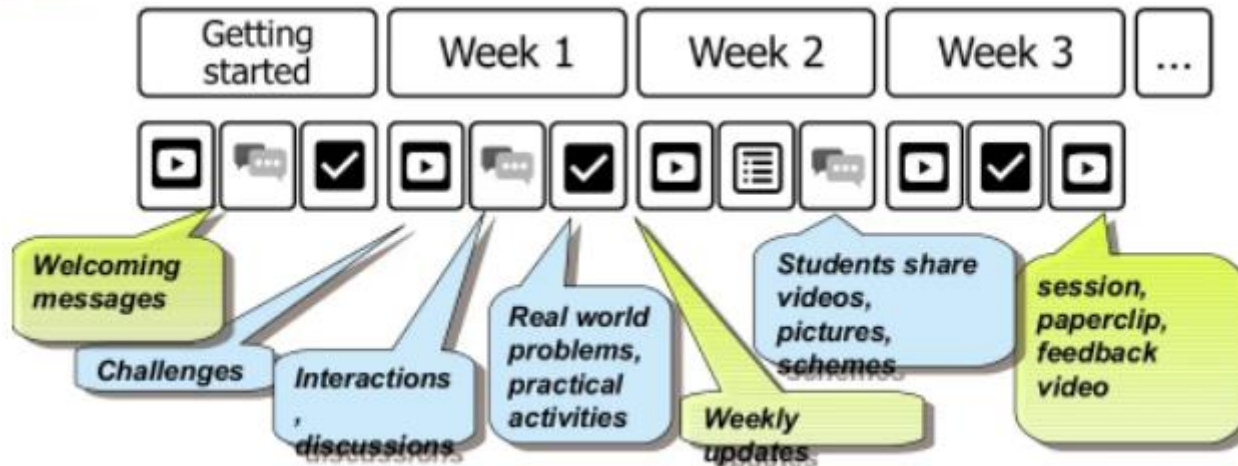
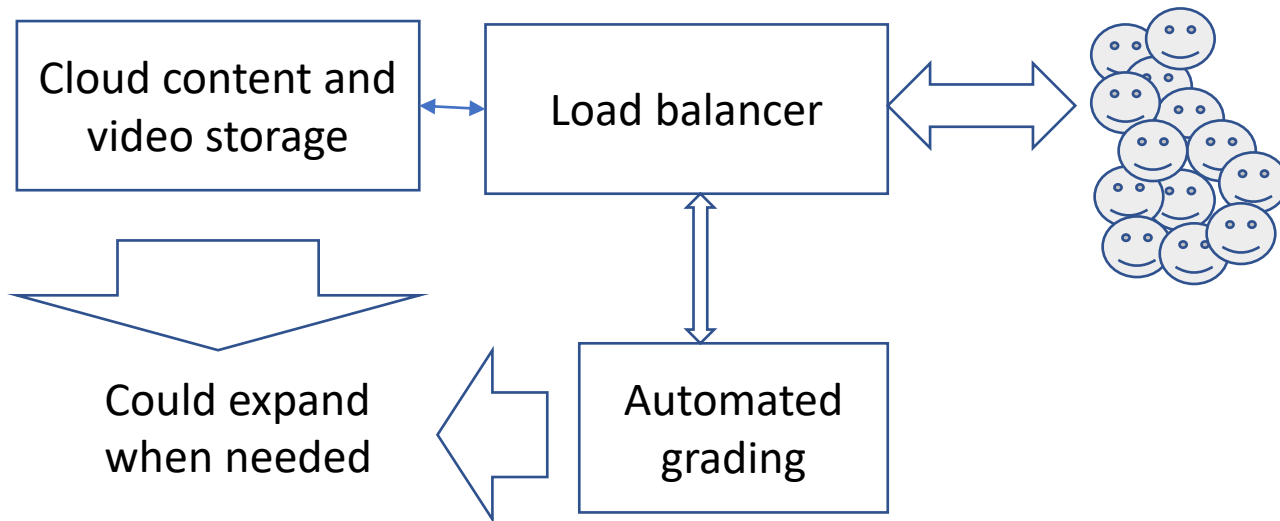


Image: Eisa rezaei, 2018, Teaching And Learning Models in MOOCs.

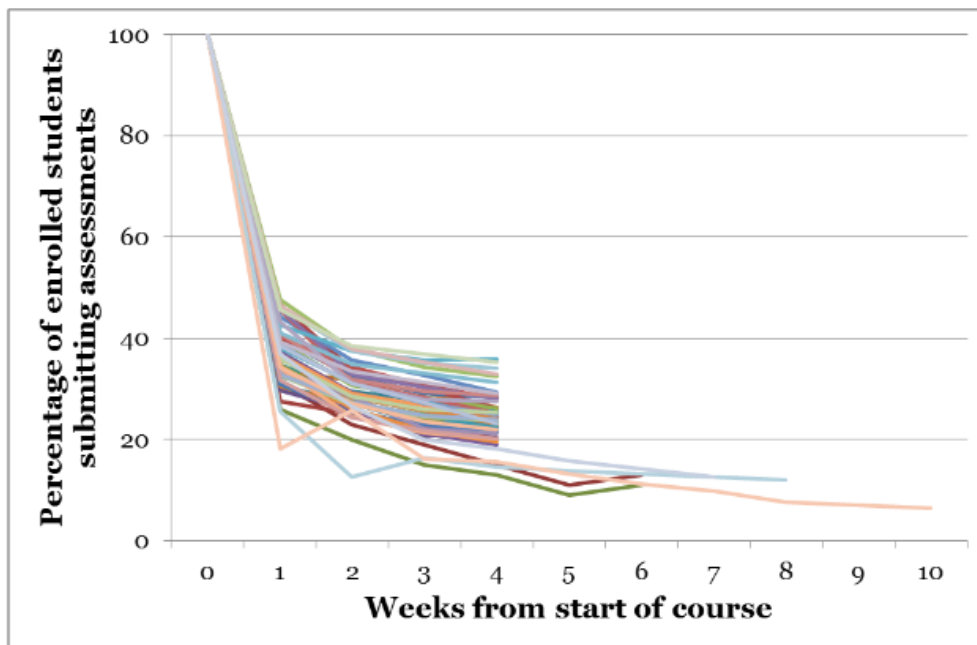
<https://www.slideshare.net/rezaeieisa/teaching-and-learning-models-in-moocs>

The xMOOC adapted video, cloud technologies and artificial intelligence to automate course delivery to massive audiences



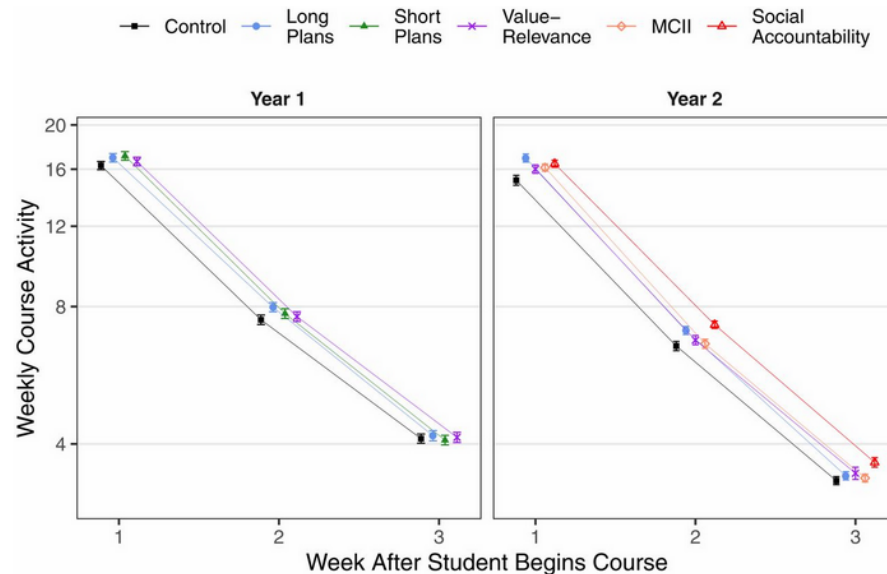
The xMOOC

Early MOOCs faced pedagogical challenges, however. Students needed to be able to manage their own learning, and the lack of personal contact and community resulted in low completion rates.





A study “found that efforts to put ‘interventions’ at the front of MOOC classes did not boost completion rates, even though the authors had good reason to think they would.”



*Average student activity (count of course platform events) in the first 3 wk after exposure to each intervention. Points show covariate-adjusted means on a logarithmic scale (to match the log-transformed outcome in the regression model) with cluster-robust SE bars.*

Derek Newton, 2020, <https://www.forbes.com/sites/dereknewton/2020/06/21/the-depressing-and-disheartening-news-about-moocs/?sh=28f4fcf176ed>

René F. Kizilcec, Justin Reich, Michael Yeomans et.al., 2020, Scaling up behavioral science interventions in online education <https://doi.org/10.1073/pnas.1921417117>

# Other MOOCs



networks



tasks



<http://ds106.us/history/>

contents



<https://www.ai-class.com/>



<https://www.coursera.org/>

<http://lisahistory.net/wordpress/2012/08/three-kinds-of-moocs/>



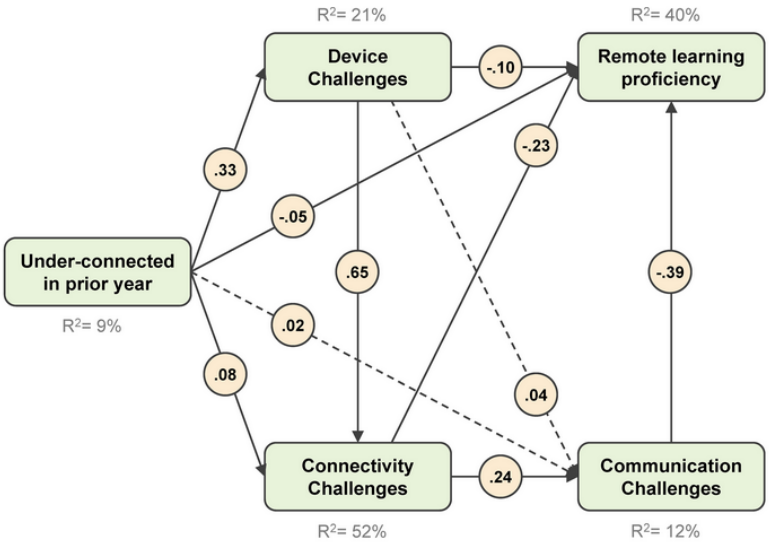
<https://sites.google.com/site/themoocguide/home>

With the recent pandemic forcing much learning to move online, educators have been catching up with MOOCs. They are bringing with them the sense of interaction and community they develop in the classroom and moving it online.

**CONTROLS**

- Gender: Female
- Race/Ethnicity: Hispanic
- Race/Ethnicity: Black
- Race/Ethnicity: Asian
- Multiple Races/Ethnicities
- First-generation student
- Family economic insecurity
- Financial hardship
- Foreign student
- In-state student
- Private university
- School year (1-4)
- Past online classes

○ Standardized coefficient    —  $p < .05$   
  $p > .05$



$N = 2810$ ;  $\chi^2 = 21.9$ ,  $p = .001$ ;  $DF = 6$ ;  $RMSEA = .03$ ;  $SRMR < .01$ ;  $TLI = .96$ ;  $CFI = 1$

doi: <https://doi.org/10.1371/journal.pone.0246641.g002>

<https://journals.plos.org/plosone/article/figure?id=10.1371/journal.pone.0246641.g002>

# Teaching in a Digital Age



MOOC providers are learning from the experience of distance learning, as for example from the SECTIONS model

Image: ARMAN MOOC Website, Mohsen Keshavarz and Andrea Ghoneim, 2021, Preparing Educators to Teach in a Digital Age <http://www.irrodl.org/index.php/irrodl/article/view/4910>  
See also <https://www.irrodl.org/index.php/irrodl/article/view/4910/5460>

**S**tudents

**E**ase of use

**C**ost

**T**eaching functions, including pedagogical affordances of media

**I**nteraction

**O**rganizational issues

**N**etworking

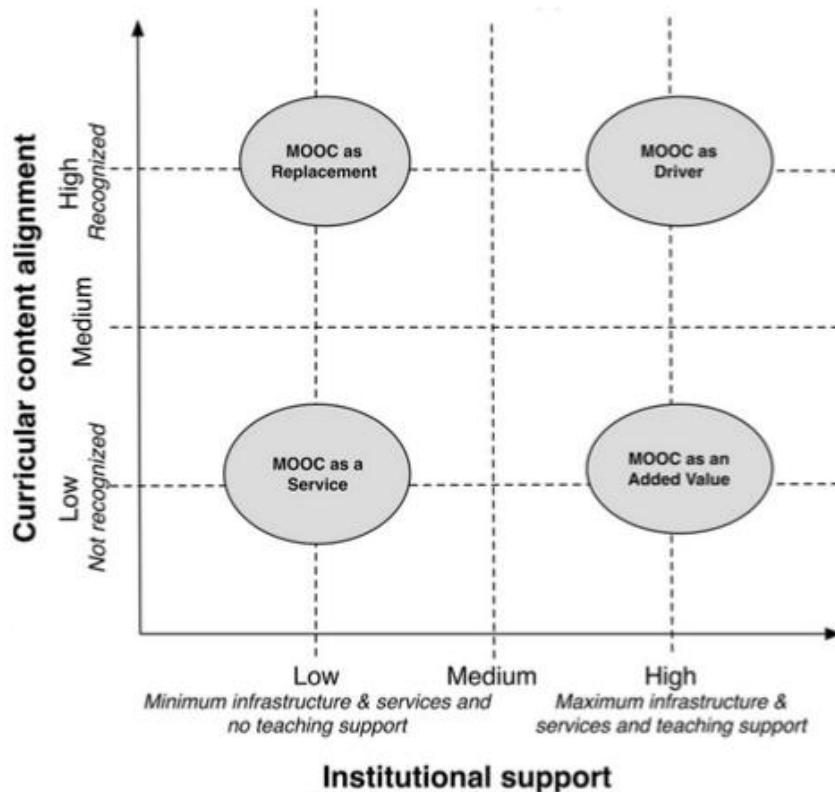
**S**ecurity and privacy



Tony Bates, 2019, Introduction to From Blackboard to MOOC

<https://www.youtube.com/watch?v=llTfFy6nKSQ>

# New models of technology and teaching enable a next generation of MOOCs.



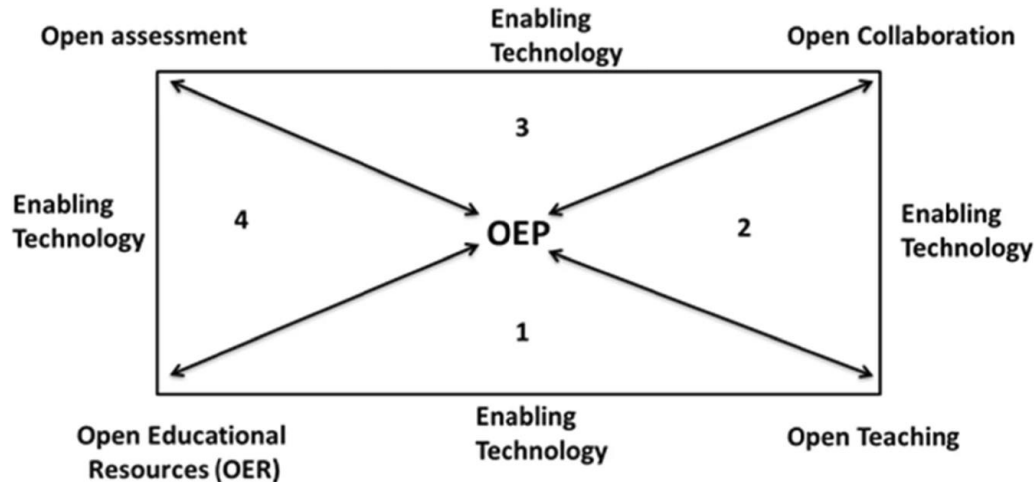
Pérez-Sanagustín, et.al, 2017, H-MOOC Framework: Reusing MOOCs for Hybrid Education.

<http://rdcu.be/oMnE>

Pérez-Sanagustín, 2021, MOOCs and University Courses during COVID-19 Pandemic

<https://mperezsanagustin.wordpress.com/2021/01/18/moocs-and-university-courses-during-covid-19-pandemic/>

# Open Educational Practices



1. OER-Enabling technology-Open teaching
2. Open teaching- Enabling technology-Open collaboration
3. Open collaboration- Enabling technology-Open assessment
4. Open assessment- Enabling technology-OER

OEP “draw upon open technologies that facilitate collaborative, flexible learning and the open sharing of teaching practices”

Ronghuai Huang et.al., 2020, Disrupted classes, undisrupted learning during COVID-19 outbreak in China: application of open educational practices and resources.

<https://slejournal.springeropen.com/articles/10.1186/s40561-020-00125-8>

Beetham, H., Falconer, I., McGill, L. and Littlejohn, A. Open practices: briefing paper. JISC, 2012

<https://oersynth.pbworks.com/w/page/51668352/OpenPracticesBriefing>

# Collaborative Online Document Authoring

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<b>Roles:</b>	<b>Activities:</b>
Writer	Brainstorm
Consultant	Converge on a plan
Reviewer	Outlining
Scribe	Drafting
Facilitator	Reviewing
	Revising
	Copyediting <sup>1</sup>
<b>Document control methods:</b>	<b>Writing strategies:</b>
Centralized	Single author (i.e., scribe)
Relay	Parallel writing (divide and conquer)
Independent	Reactive writing
Shared	Parallel writing (different roles)
<b>Work modes:</b>	Sequential writing
Degree of proximity	Mixed mode
Degree of synchronicity	

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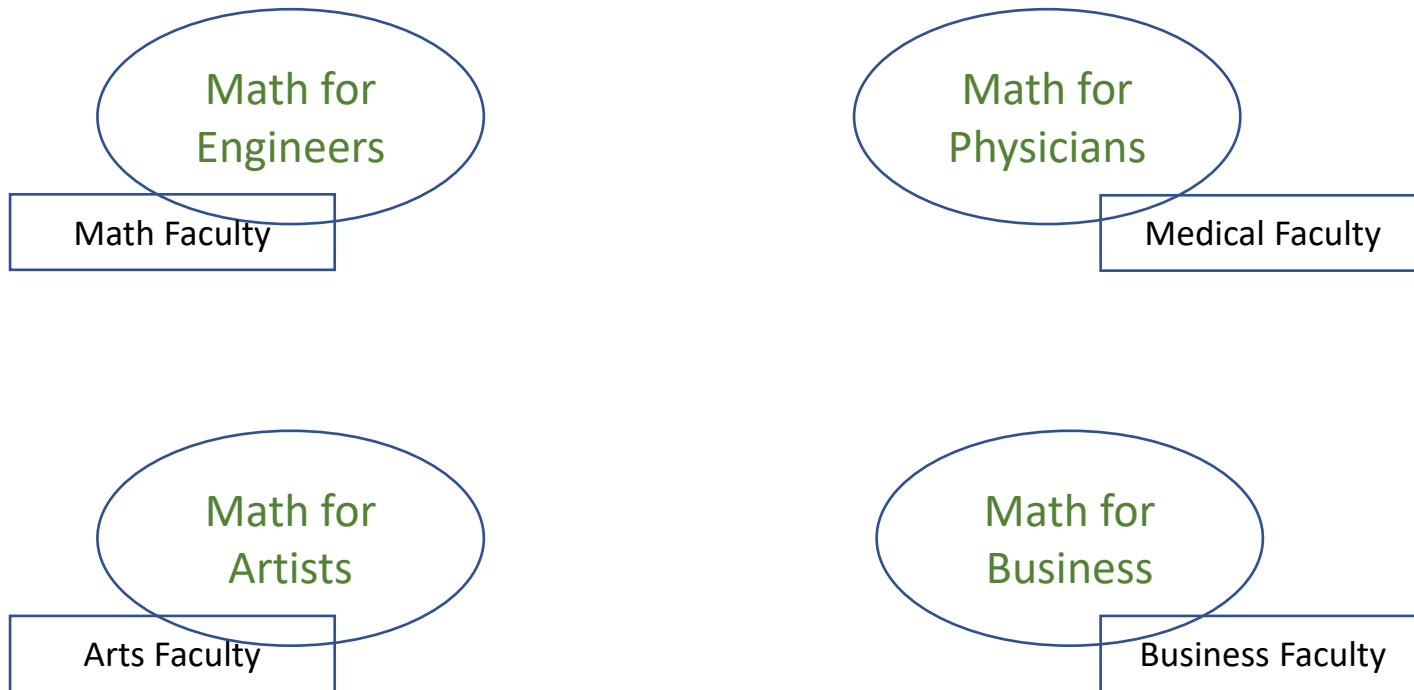
Many examples of collaborative writing as note-taking, assignment, writing project, etc

- Olson, et.al. How people write together now: Beginning the investigation with advanced undergraduates in a project course. <https://dl.acm.org/doi/pdf/10.1145/3038919>
- Goei, et.al., 2021, Online lesson study: virtual teaming in a new normal. <https://www.emerald.com/insight/content/doi/10.1108/IJLLS-09-2020-0078/full/html>
- Vandendorpe, 2021, Book sprint for FAIR Adoption Handbook for Universities. <https://blog.zbmed.de/booksprint-for-fair-adoption-handbook-by-fairsfair/>



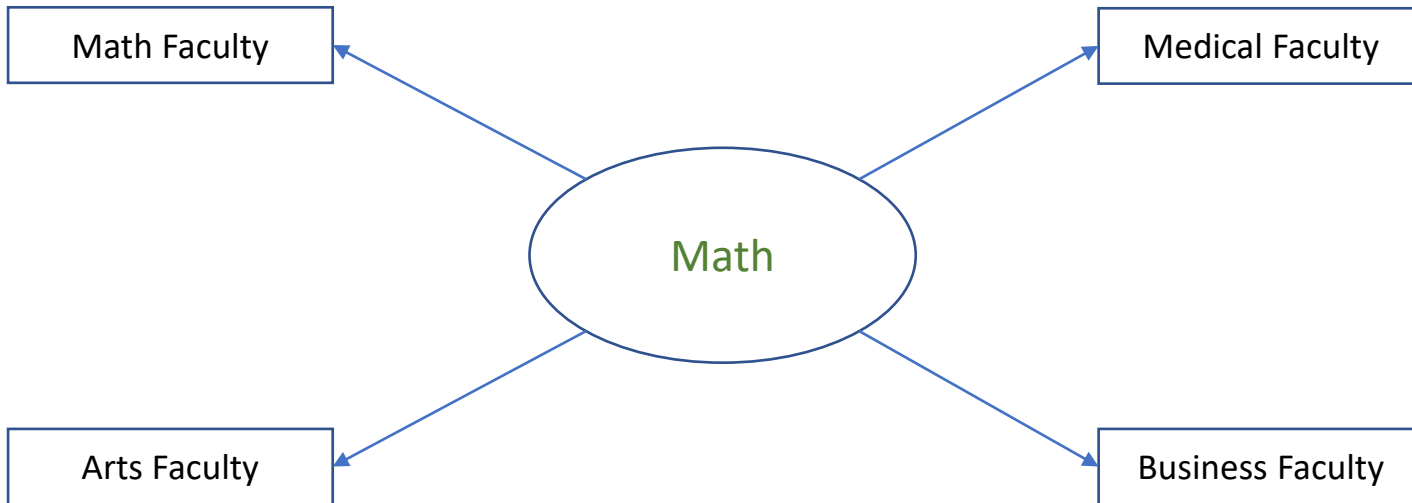
# Decentralized Course Design

Decentralized course design originally



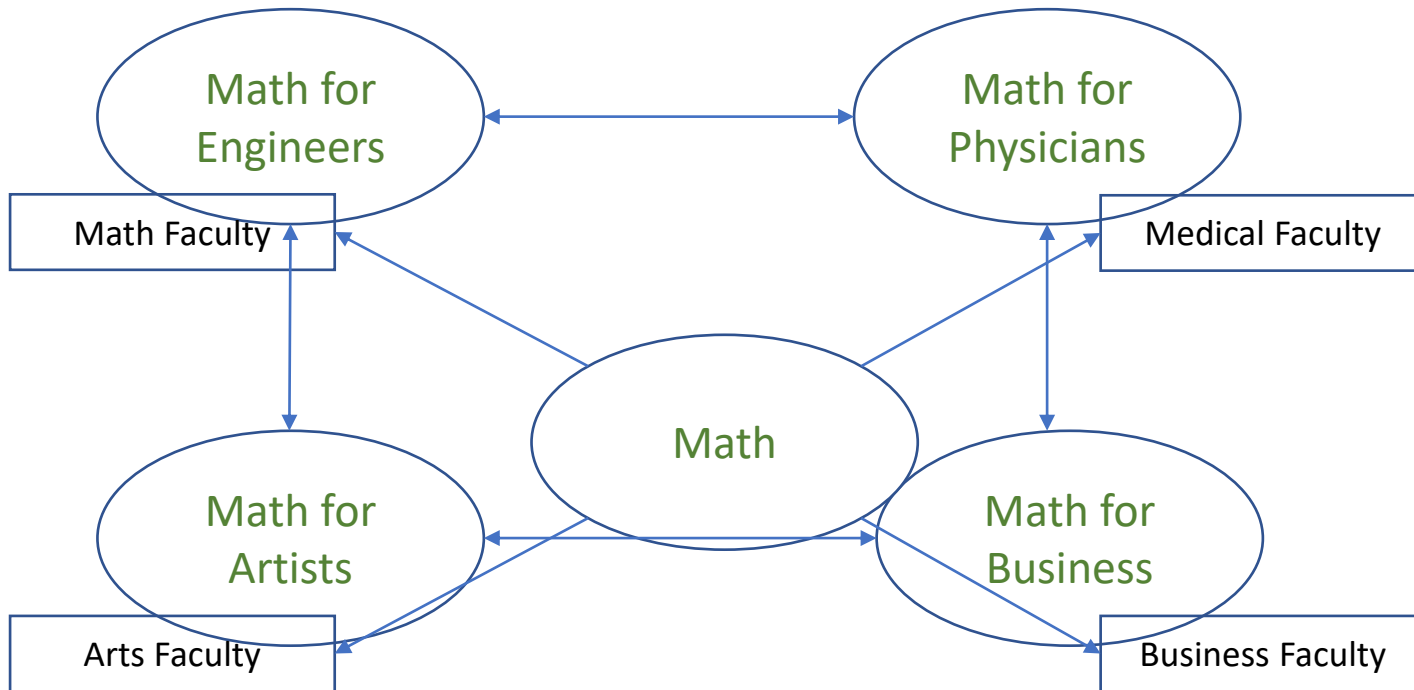
# Centralized Course Design

Decentralized course design originally

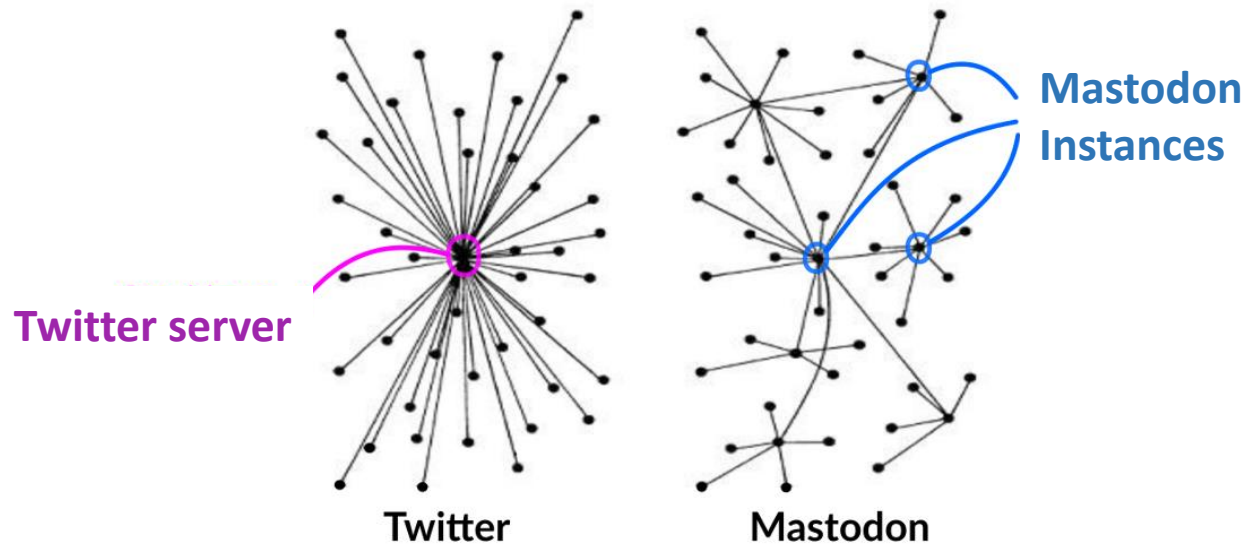


# Decentralized Course Design

Decentralized course design originally

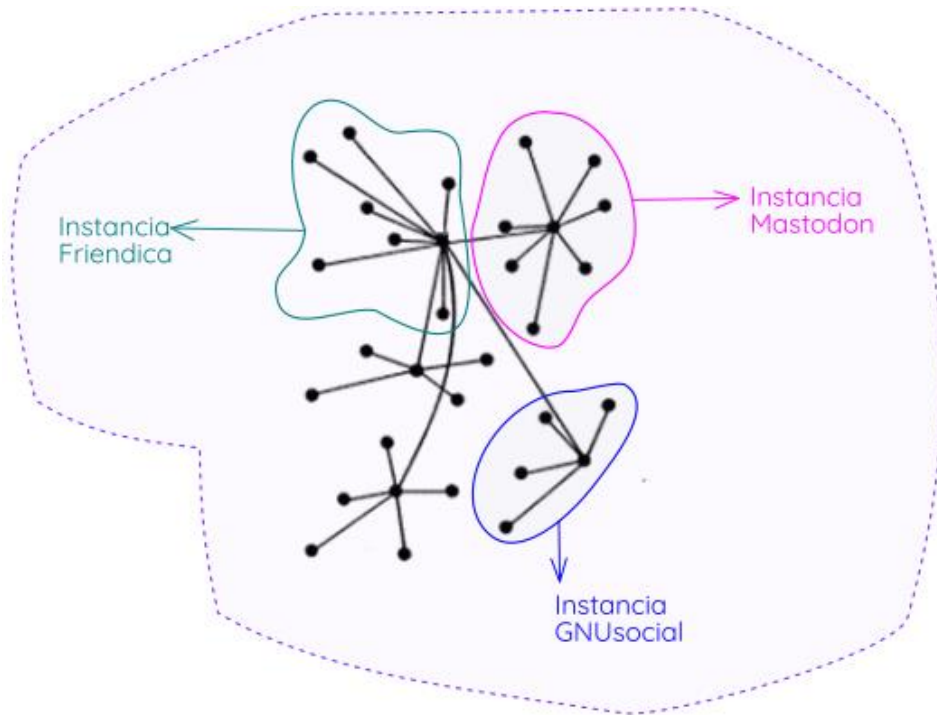


# Federation



Federation is a principle in social networks describing the transition to decentralized networks

# The Fediverse



Common protocols allow different federated technologies to communicate with each other

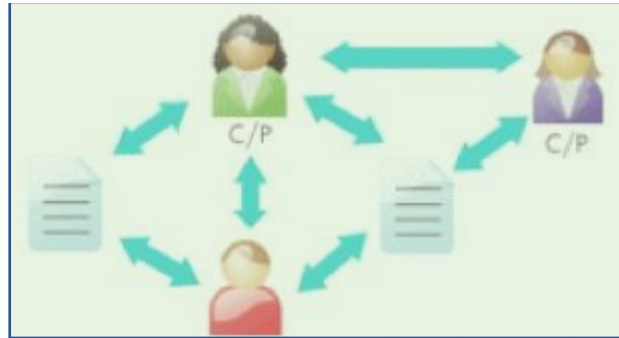
Image: <https://radioslibres.net/fediverso/>

# Web3

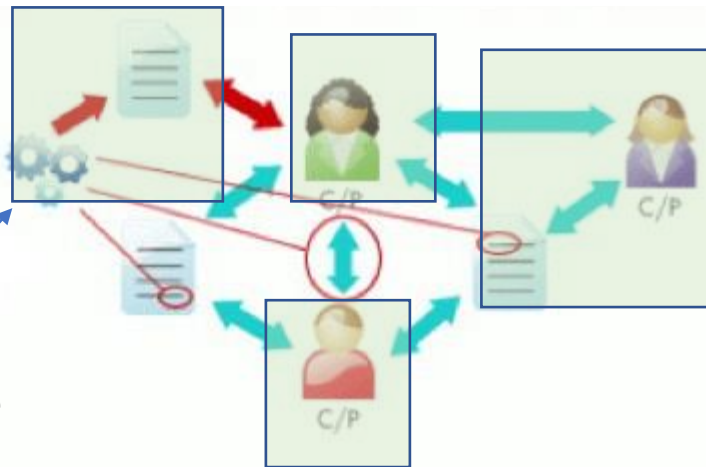
**Web 1.0**



**Web 2.0**

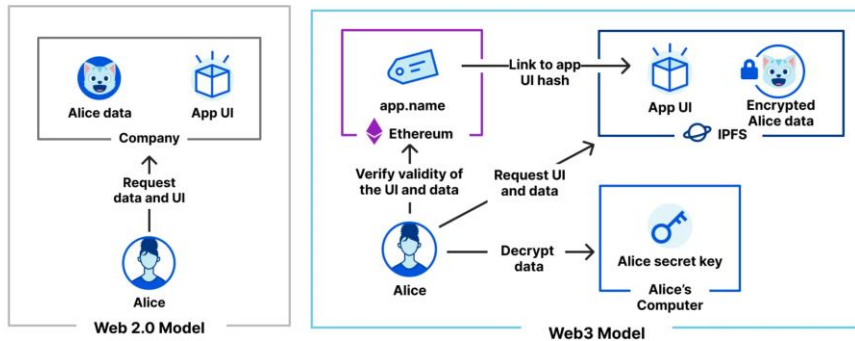
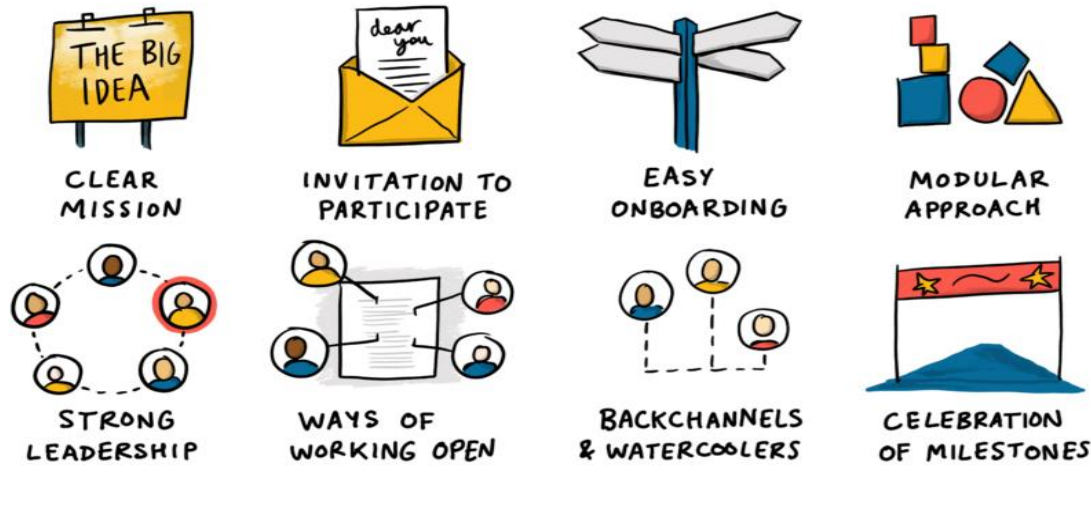


**Web 3.0**



Data  
Artificial Intelligence  
Blockchain

# New distributed platforms enable an architecture of participation based on co-creating and sharing resources

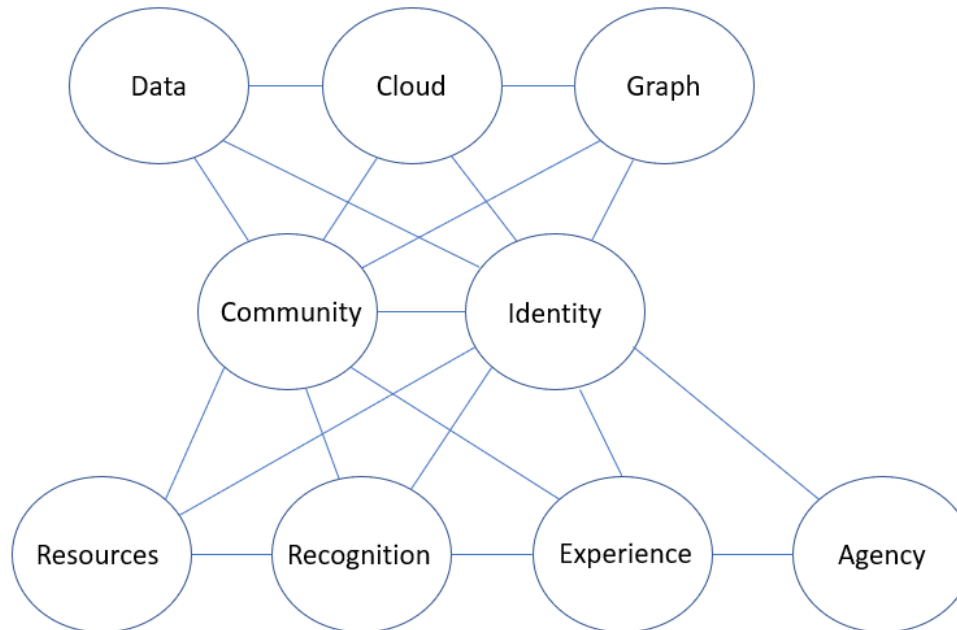


Doug Belshaw - <https://blog.weareopen.coop/howto-create-an-architecture-of-participation-for-your-open-source-project-a38386c69fa5>

Web3 Explained - <https://techjourneyman.com/blog/web3-explained/>

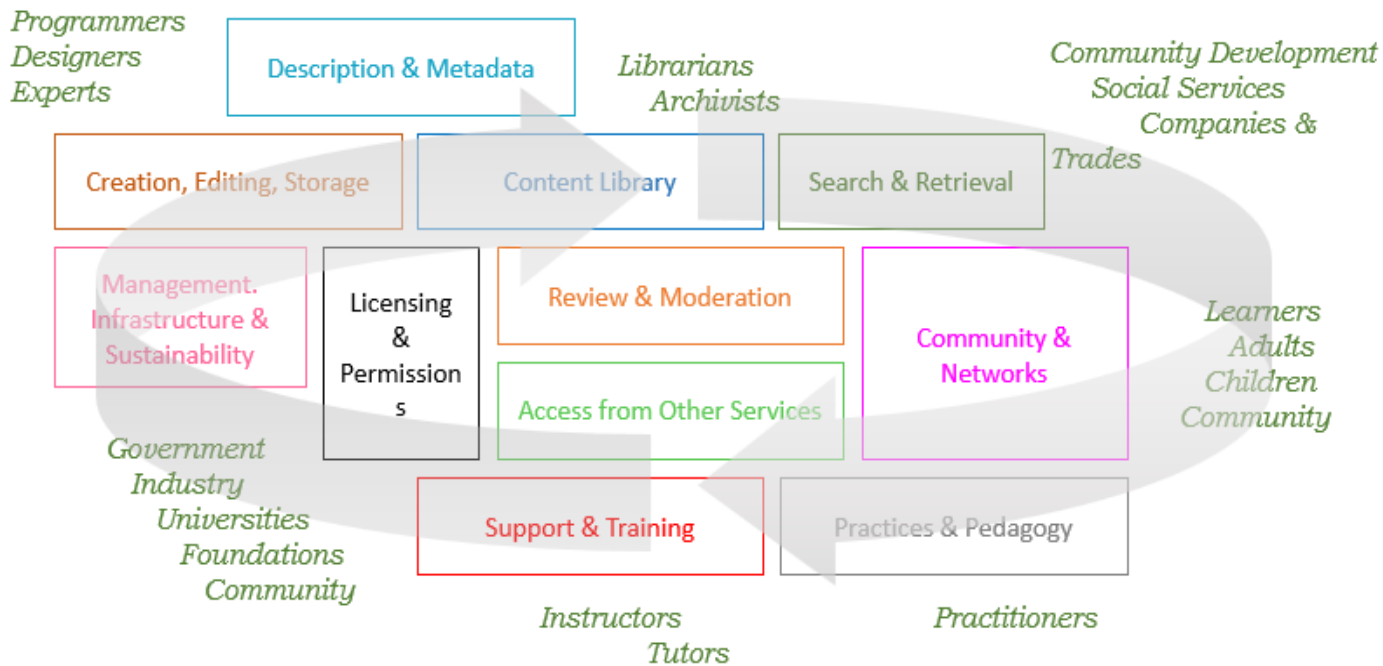
# Ed3

## Distributed Learning Technology



<https://el30.mooc.ca/>





## Supporting Open Learning Resources

<https://www.downes.ca/presentation/559>

# Data Based MOOC (dbMOOC)

Built around a cooperative database

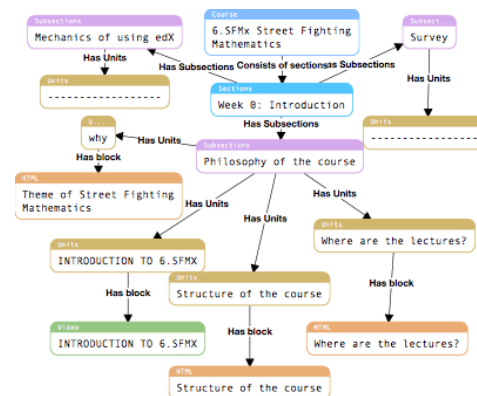
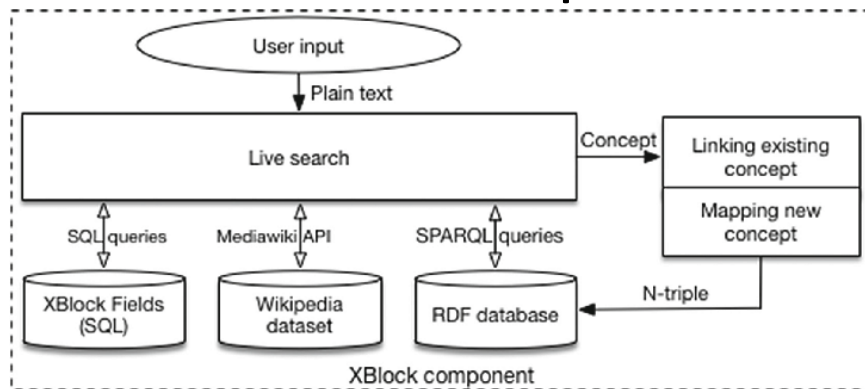


Image by terry10 on Alteryx

Welcome to Data Literacy

Dmitry Mouromtsev, wt.al., 2016

[https://www.researchgate.net/publication/312635085\\_Metadata\\_Extraction\\_from\\_Open\\_edX\\_Online\\_Courses\\_Using\\_Dynamic\\_Mapping\\_of\\_NoSQL\\_Queries](https://www.researchgate.net/publication/312635085_Metadata_Extraction_from_Open_edX_Online_Courses_Using_Dynamic_Mapping_of_NoSQL_Queries)

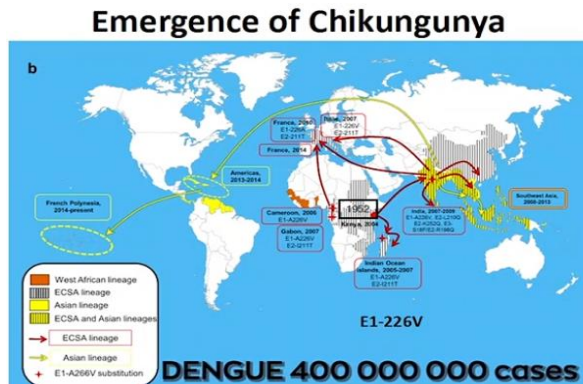
Downes, 2022, Data Literacy MOOC

<https://data.mooc.ca>

<https://www.youtube.com/playlist?list=PLBQHzQN9x3Ro289GA7IPaJLdXwxXtLp>

# Live-Linked Data MOOC (IdMOOC)

Live linked data world-wide from federated scientific network becomes content for IbMOOC



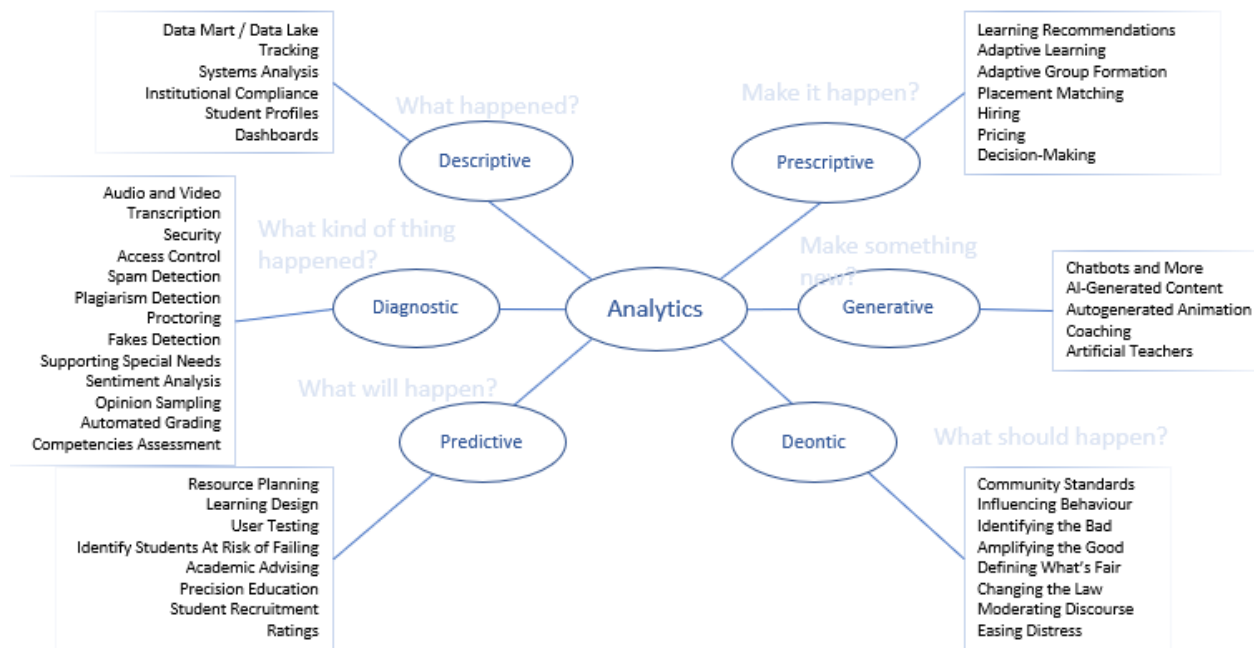
Zouache K, Failloux AB. 2015 Insect-pathogen interactions: contribution of viral adaptation to the emergence of vector-borne diseases, the example of chikungunya. Current Opinion In Insect Science 10:14-21.



FUN MOOC – Medical Entomology

<https://www.dailymotion.com/video/x6yh8mo>

# AI-Supported MOOC (aiMOOC)



Artificial Intelligence in e-learning,

<https://ethics.mooc.ca/>

# Example



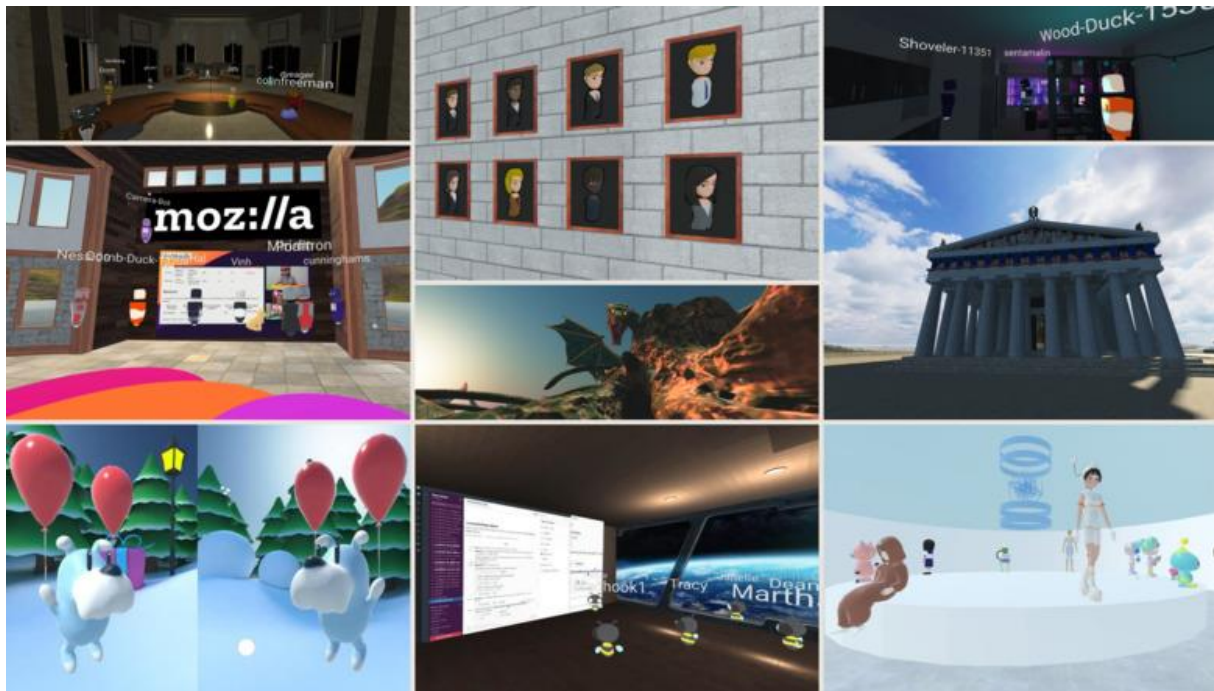
## Artificial Intelligence (AI) for Earth Monitoring

“massive amounts of Earth observation data that are collected every day from space”

<https://www.futurelearn.com/courses/artificial-intelligence-for-earth-monitoring>

# Massive Open Online Simulation (MOOS)

Creating a MOOC in the multiverse...



Astra, et.al., 2022 Massive Open Online Simulation (MOOS) of physics concepts microscopic for improving creative thinking

[https://www.researchgate.net/publication/350911228\\_Massive\\_Open\\_Online\\_Simulation\\_MOOS\\_of\\_physics\\_concepts\\_microscopic\\_for\\_improving\\_creative\\_thinking](https://www.researchgate.net/publication/350911228_Massive_Open_Online_Simulation_MOOS_of_physics_concepts_microscopic_for_improving_creative_thinking)

# Defining the Multiverse

- **VR (Virtual Reality)** uses a headset or viewing device I
- **AR (Augmented Reality)** uses a see-through viewing device
- **MR (Mixed Reality)** is a merging of virtual and real environments
- **XR (eXtended Reality)** is a term that refers to VR, AR and MR technologies in general.
- **The Metaverse** includes all XR technologies and combines it with persistent digital objects

# Thank You



<https://www.downes.ca>