# The Next Generation of MOOCs

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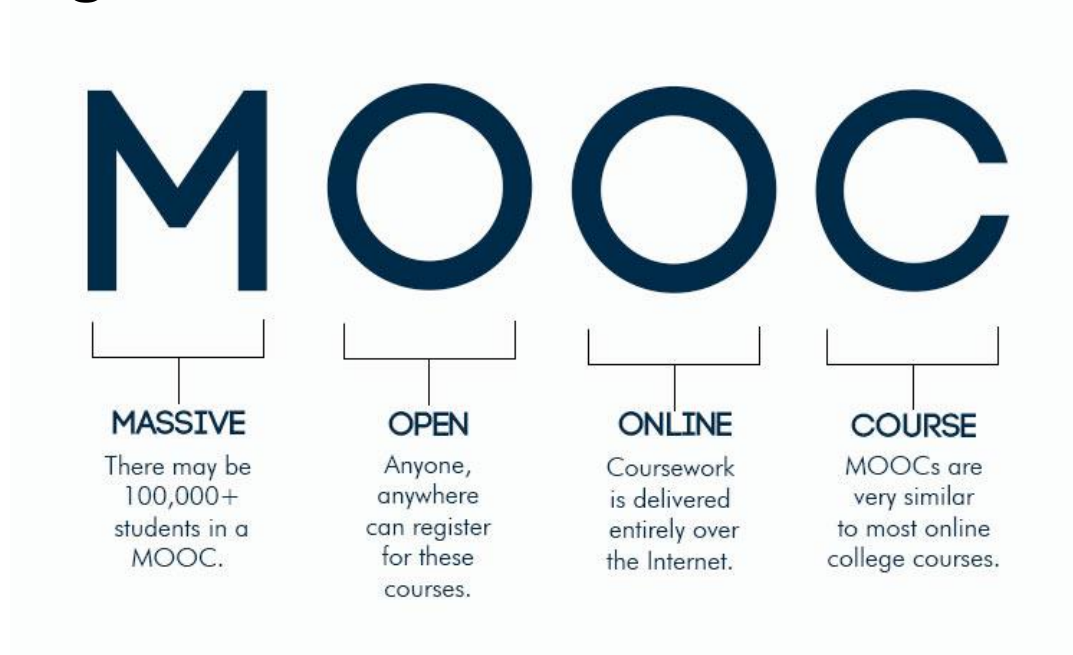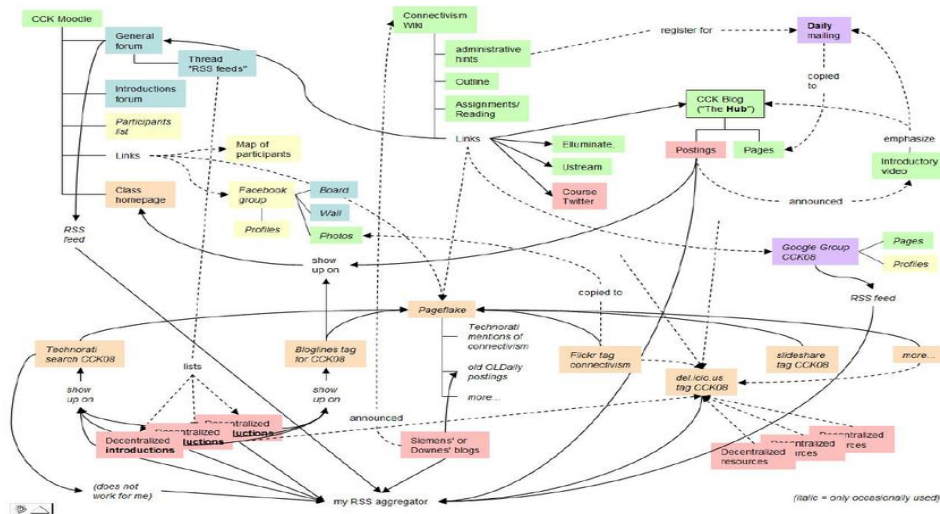


**MOOC**

**MASSIVE**
There may be 100,000+ students in a MOOC.

**OPEN**
Anyone, anywhere can register for these courses.

**ONLINE**
Coursework is delivered entirely over the Internet.

**COURSE**
MOOCs are very similar to most online college courses.

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

# Original cMOOC

Based on the idea of free access and open educational resources (OER), MOOCs enabled teachers and instructors to reach thousands of students in a single class.

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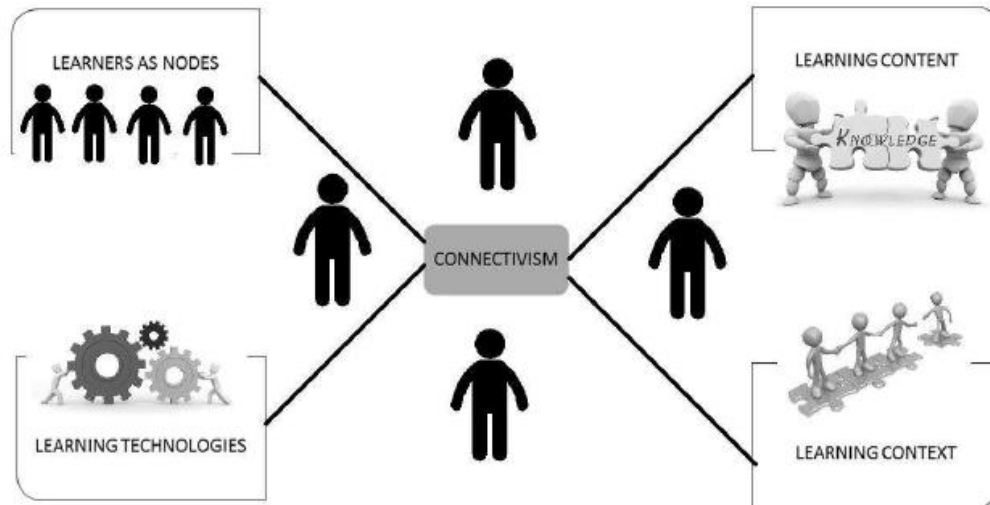


Connectivism is the thesis that knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks

Stephen Downes, 2022, Connectivism.
http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/623

# xMOOC

The x in xMOOC stands for eXtended



Image:  Eisa rezaei, 2018, Teaching And Learning Models in MOOCs.
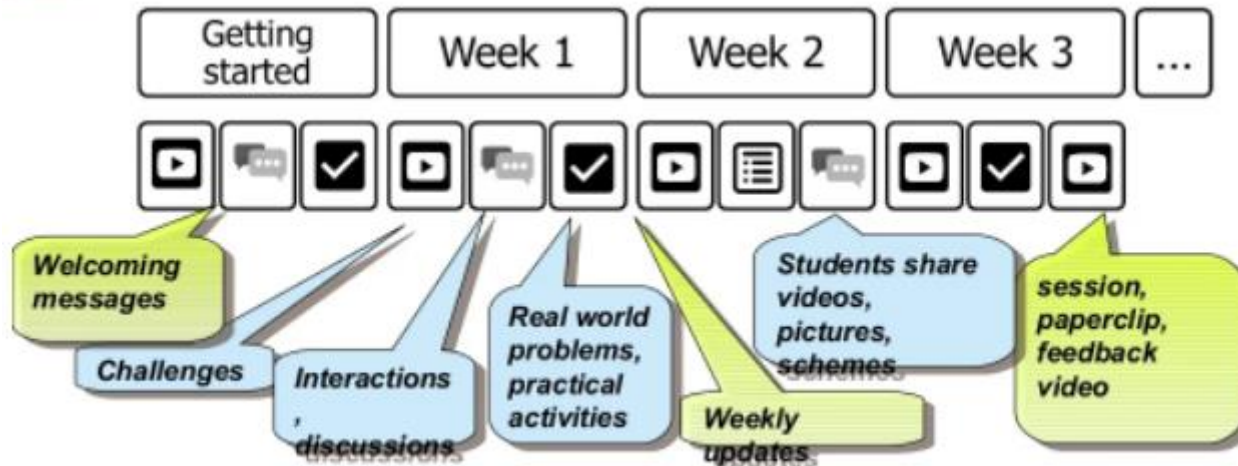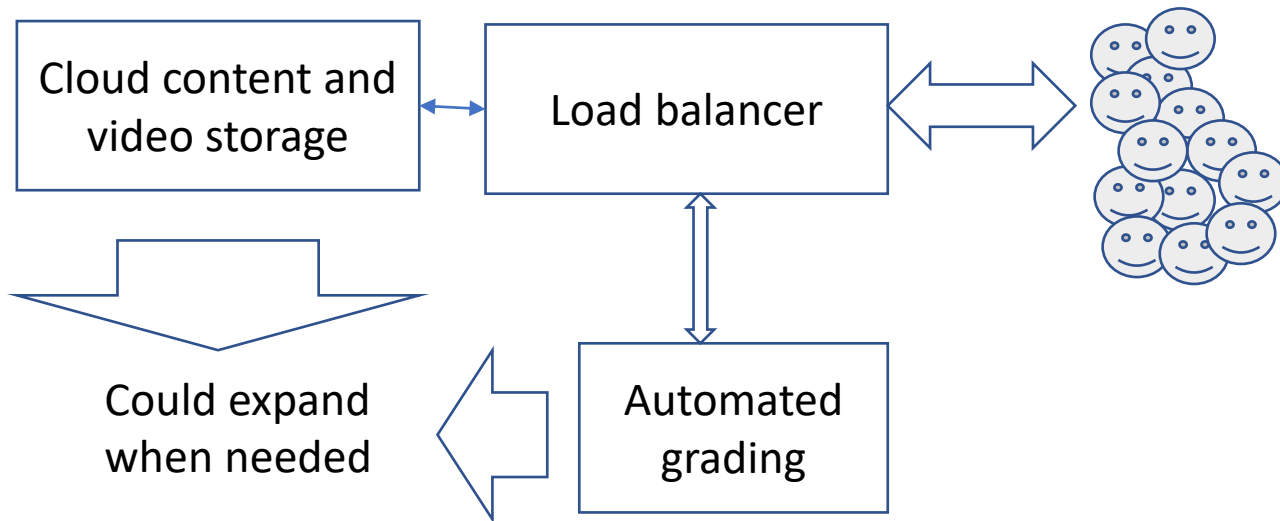https://www.slideshare.net/rezaeieisa/teaching-and-learning-models-in-moocs

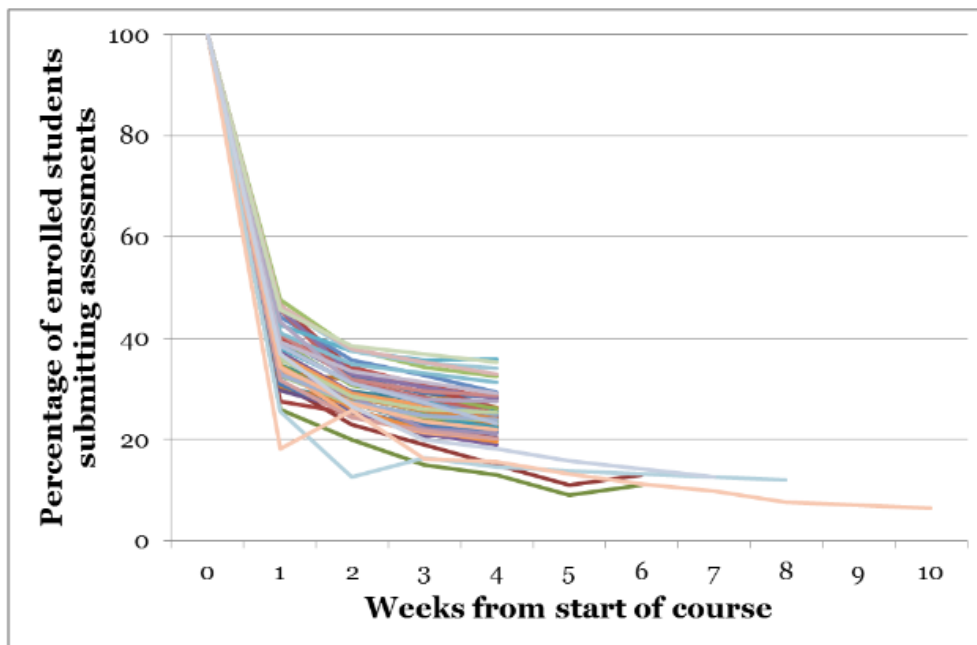# The xMOOC adapted video, cloud technologies and artificial intelligence to automate course delivery to massive audiences



Cloud content and video storage → Load balancer → (audience)

Load balancer ↕ Automated grading

Automated grading → Could expand when needed

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.

Katy Jordan, 2015, Massive open online course completion rates revisited: Assessment, length and attrition
http://www.irrodl.org/index.php/irrodl/article/view/2112

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."
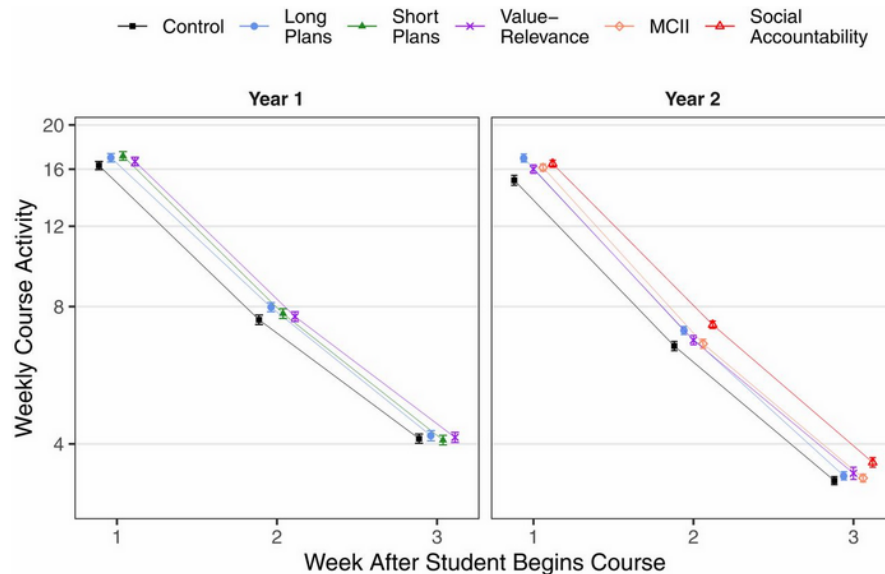


Average student activity (count of course platform events) in the first 3 wk after exposure to each intervention. Points show covariate-adjusted means on a logarithmic scale (to match the log-transformed outcome in the regression model) with cluster-robust SE bars.

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



cMOOC ← → xMOOC

networks

CCK08

Autres cours

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

tasks

DS106

http://ds106.us/history/

contents

Artificial Intelligence

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

coursera

https://www.coursera.org/

coursera

KHAN

udemy

edX

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.

# 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

**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=lITfFy6nKSQ

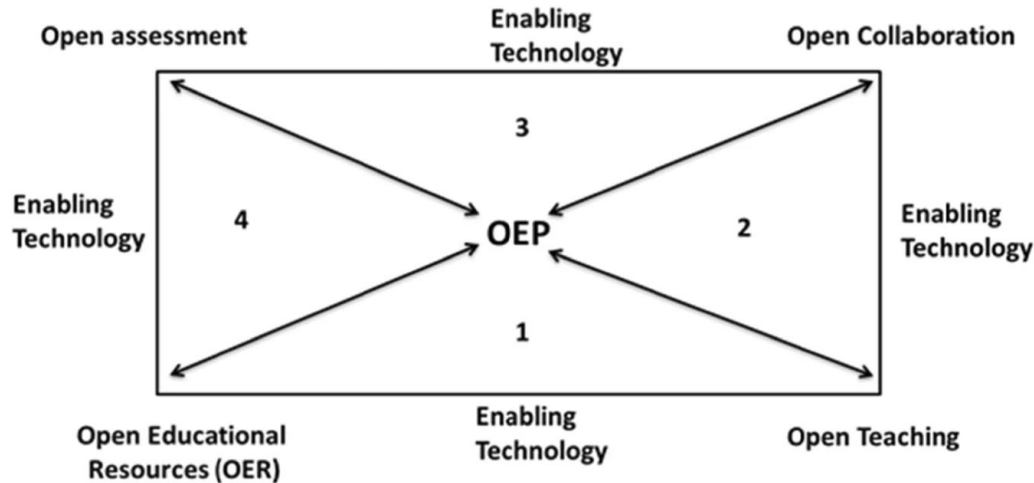# New models of technology and teaching enable a next generation of MOOCs.
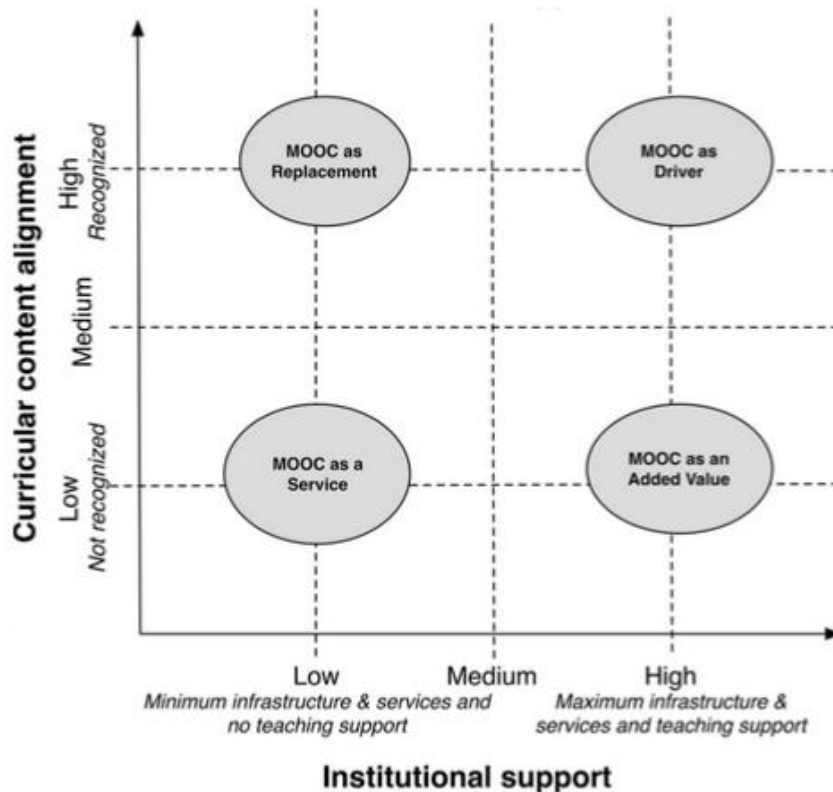
Pérez-Sanagustín, et.al, 2017, H-MOOC Framework: Reusing MOOCs for Hybrid Education.
http://rdcu.be/oMnE
Pérez-Sanagustín, 2021, MOOCs and University Courses during COVID-19 Pandemic
https://mperezsanagustin.wordpress.com/2021/01/18/moocs-and-university-courses-during-covid-19-pandemic/

# Open Educational Practices



**Open assessment**  **Enabling Technology**  **Open Collaboration**

**Enabling Technology**  4  3  **OEP**  2  **Enabling Technology**

1

**Open Educational Resources (OER)**  **Enabling Technology**  **Open Teaching**

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

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

## 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

Math for Engineers

Math Faculty

Math for Physicians

Medical Faculty

Math for Artists

Arts Faculty

Math for Business

Business Faculty
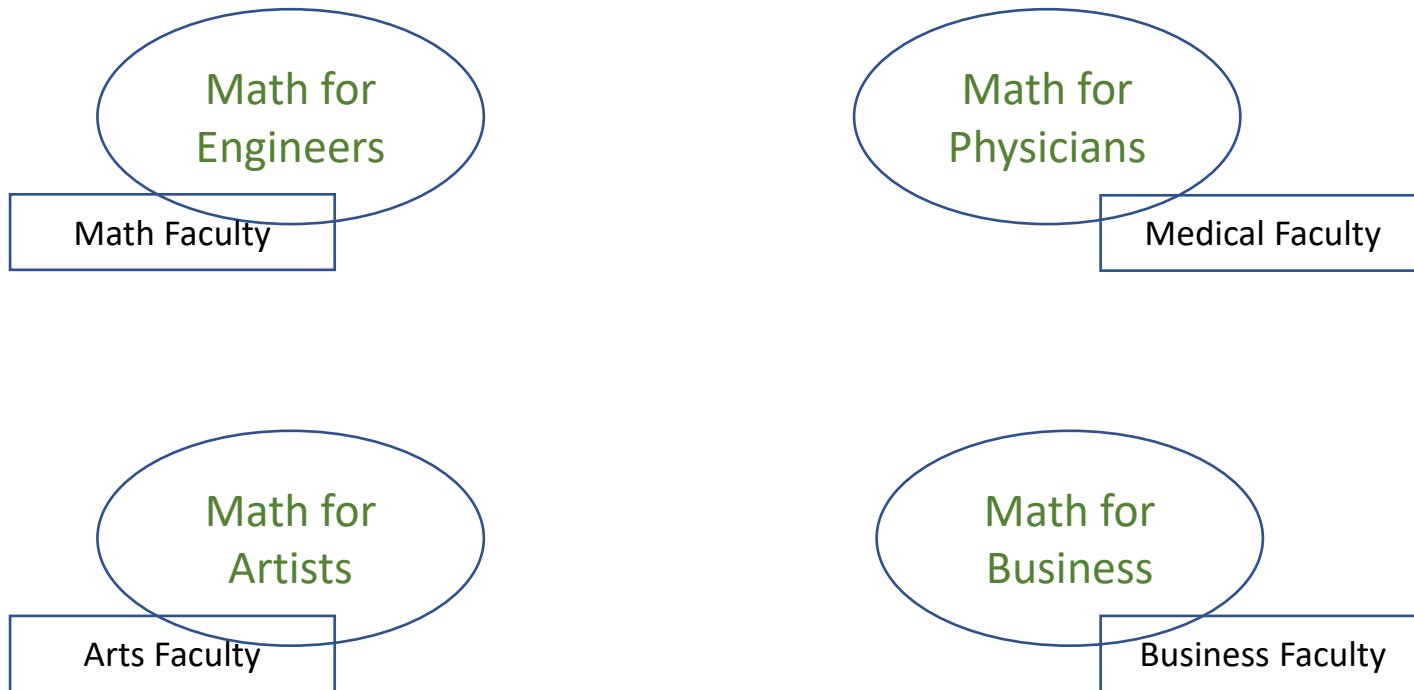
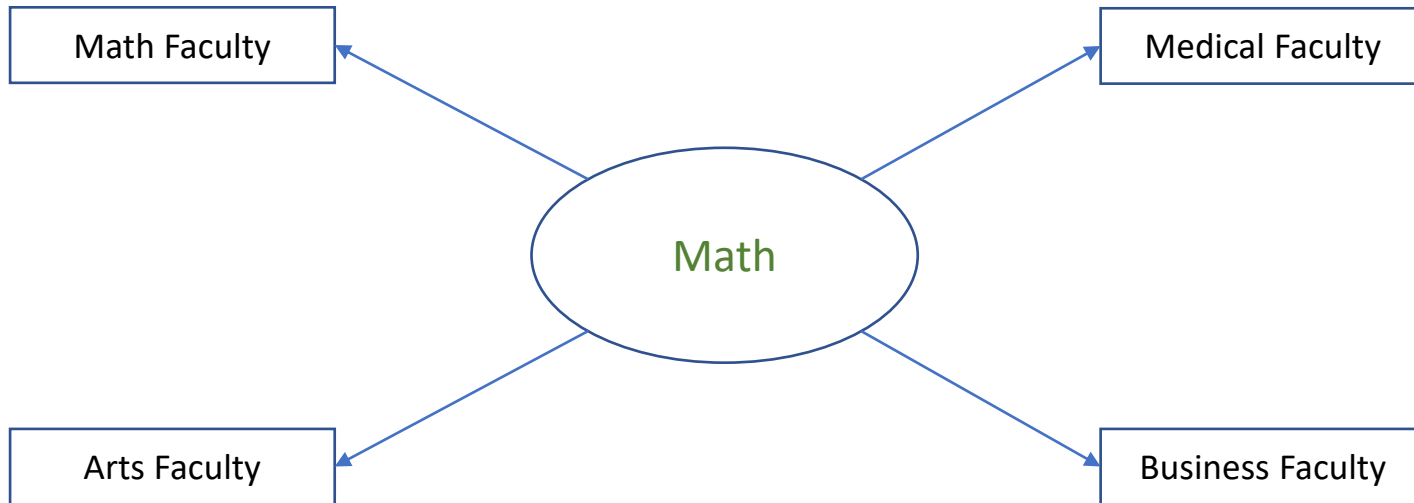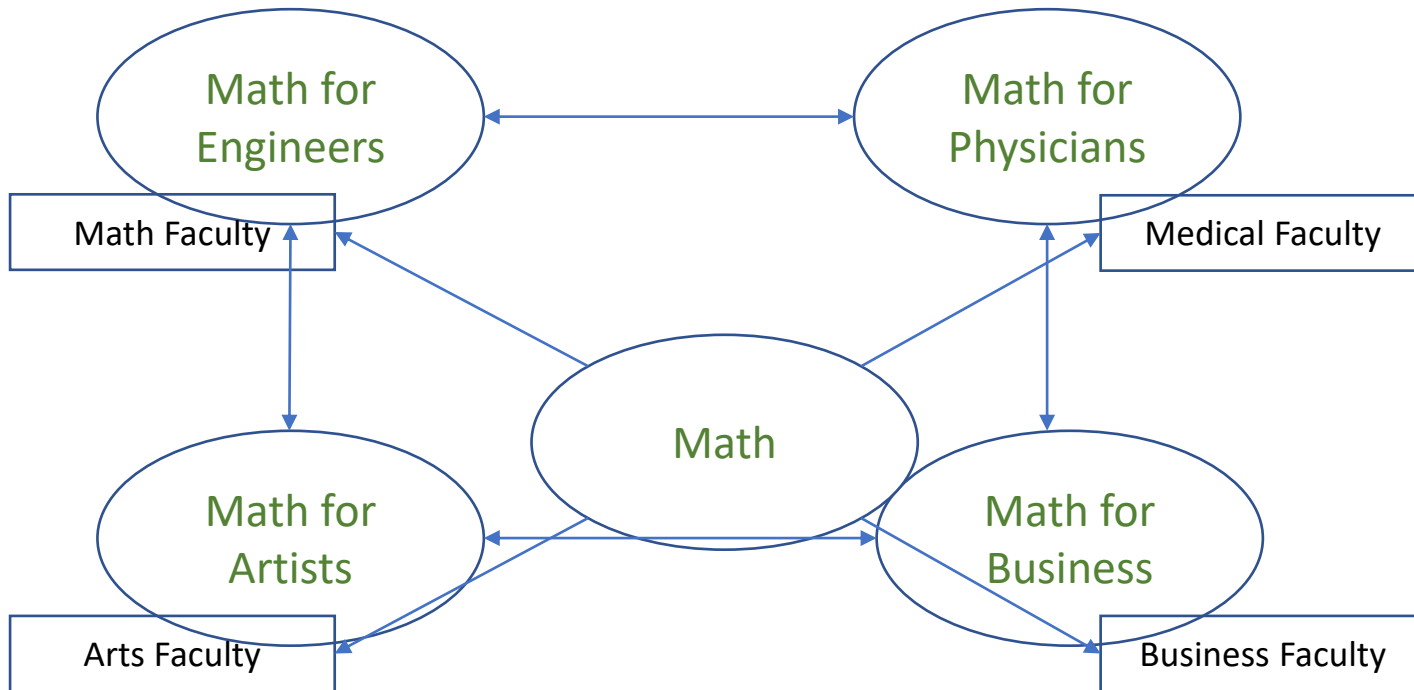# Centralized Course Design

Decentralized course design originally

# Decentralized Course Design

Decentralized course design originally

# Federation
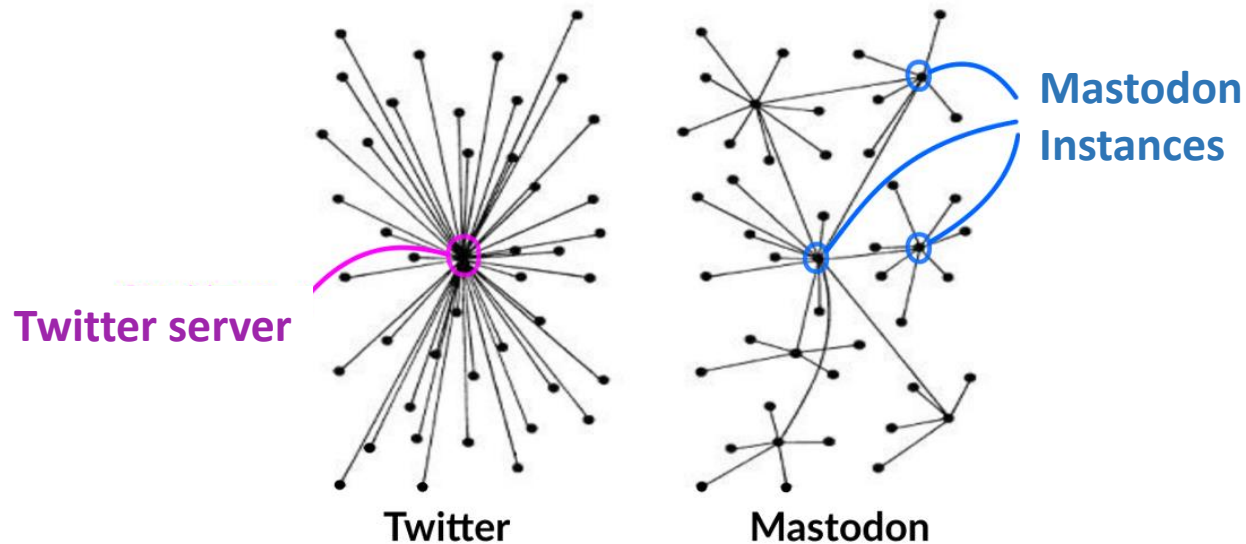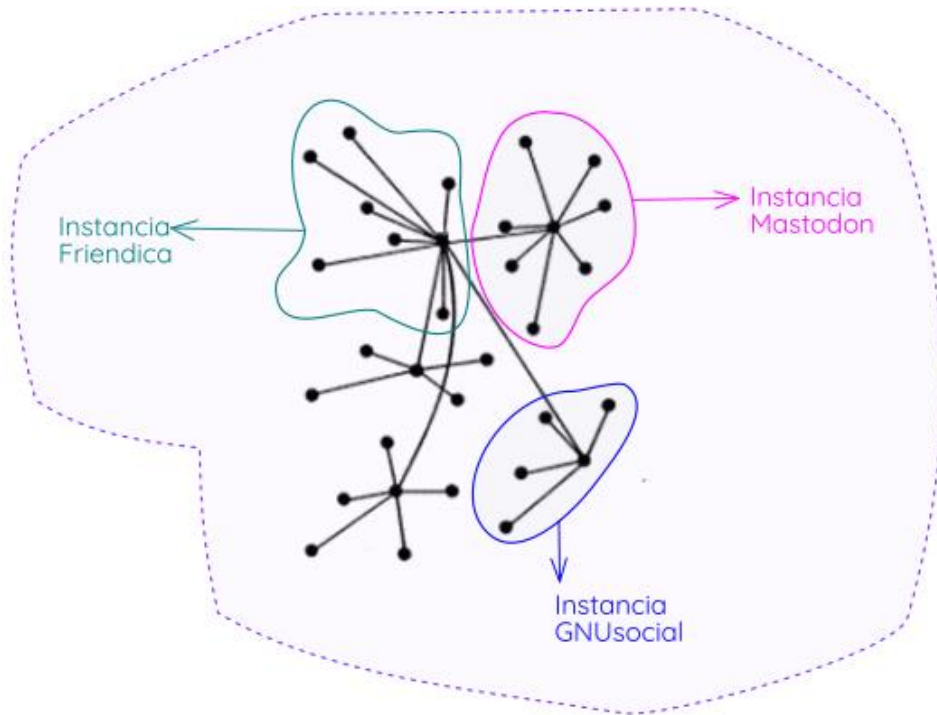


**Twitter server**

**Mastodon Instances**

Twitter   Mastodon

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

# The Fediverse



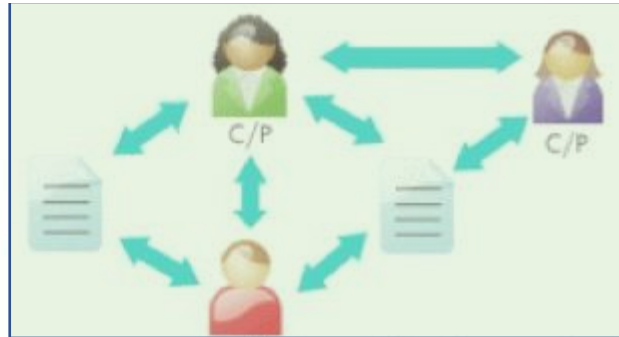Common protocols allow different federated technologies to communicate with each other

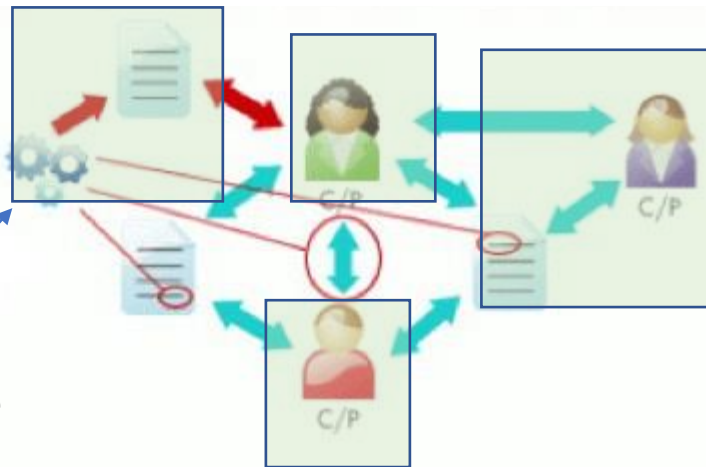Image: https://radioslibres.net/fediverso/
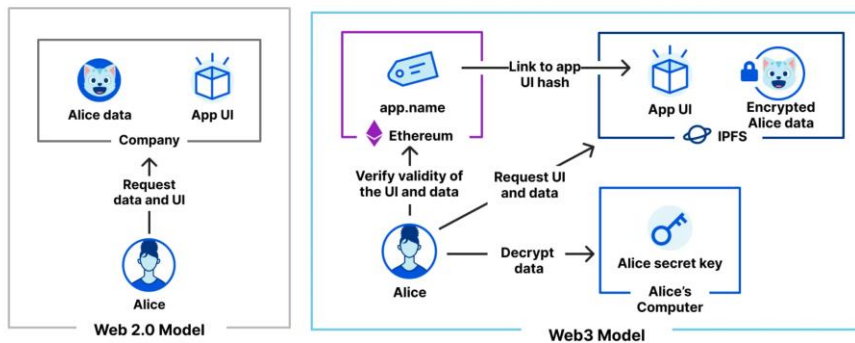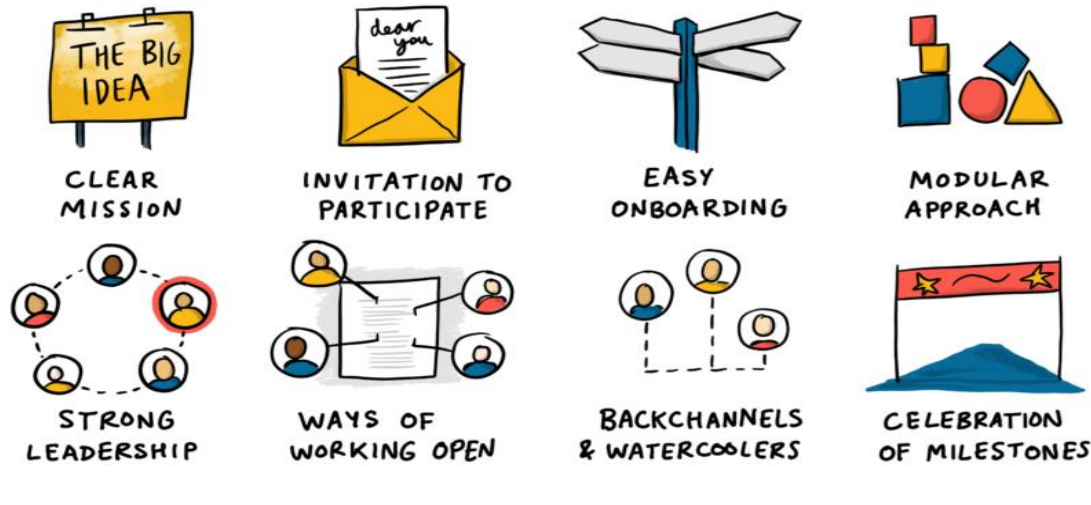
# Web3



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



CLEAR MISSION

INVITATION TO PARTICIPATE

EASY ONBOARDING

MODULAR APPROACH

STRONG LEADERSHIP

WAYS OF WORKING OPEN

BACKCHANNELS & WATERCOOLERS

CELEBRATION OF MILESTONES



Alice data | App UI
Company
↑
Request data and UI
|
Alice
Web 2.0 Model

app.name
◆ Ethereum
Verify validity of the UI and data
Request UI and data
Link to app UI hash
App UI | Encrypted Alice data
🪐 IPFS
Alice
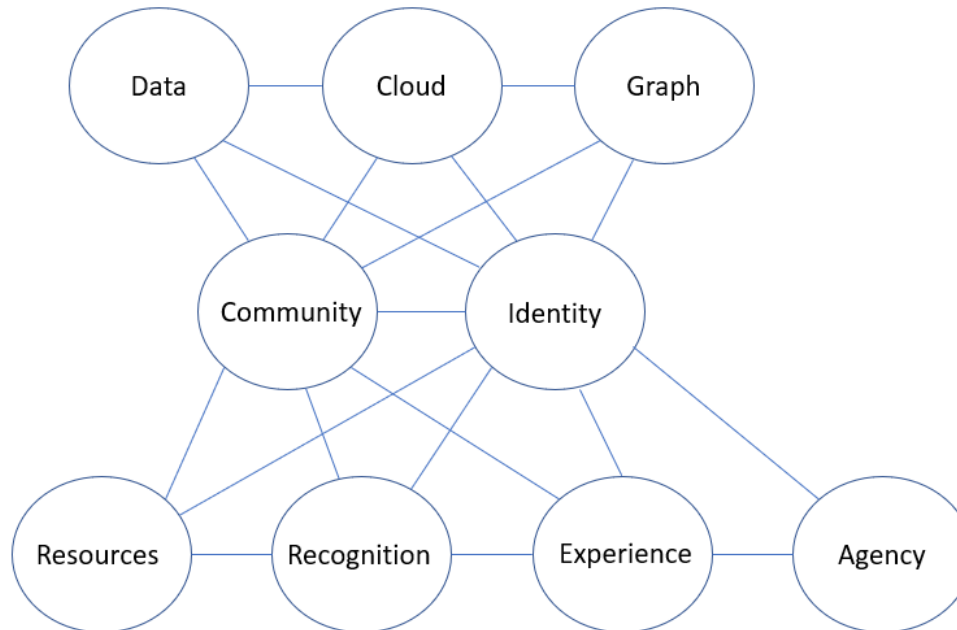Decrypt data → Alice secret key
Alice's Computer
Web3 Model

Doug Belshaw - https://blog.weareopen.coop/howto-create-an-architecture-of-participation-for-your-open-source-project-a38386c69fa5
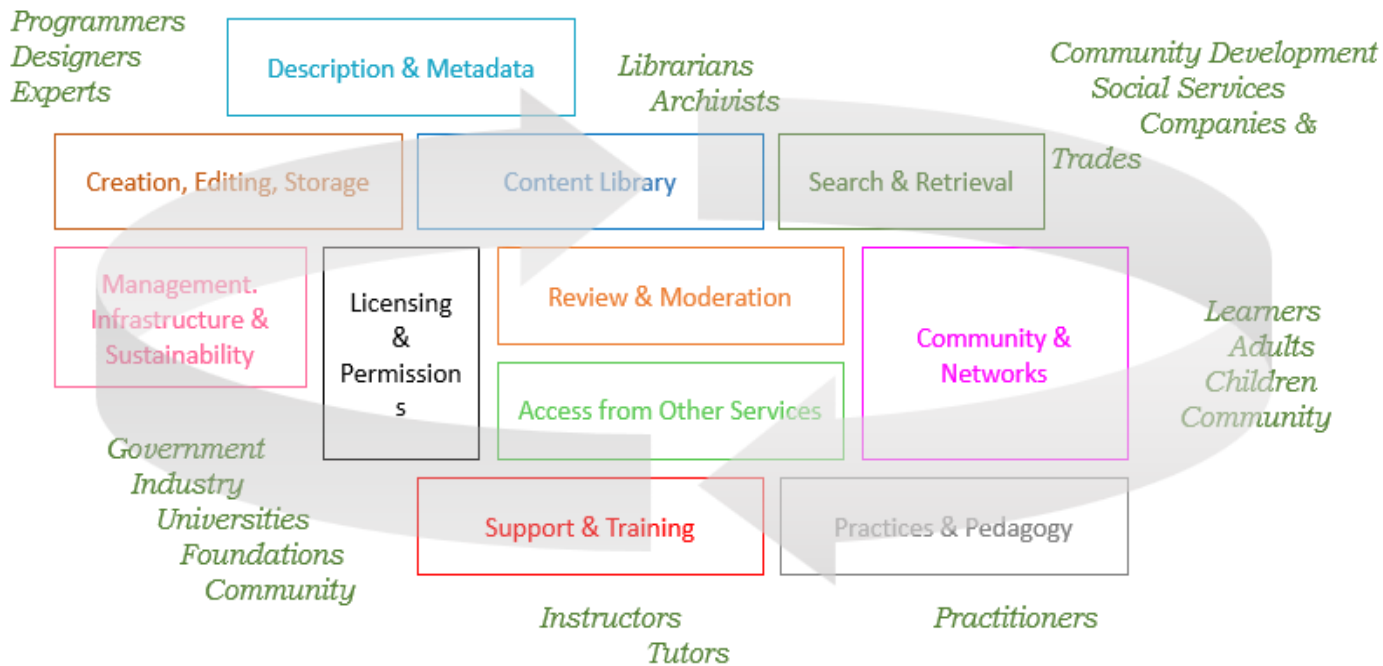Web3 Explained - https://techjourneyman.com/blog/web3-explained/

# Ed3

Distributed Learning Technology

# Supporting Open Learning Resources

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

# Data Based MOOC (dbMOOC)

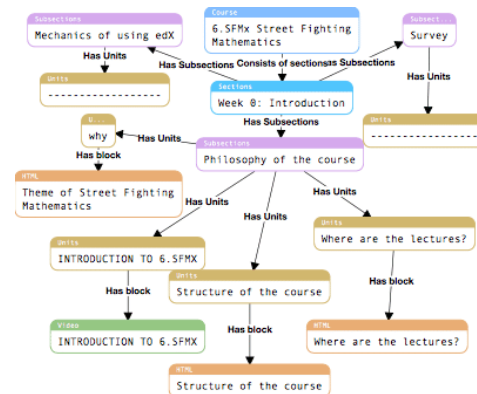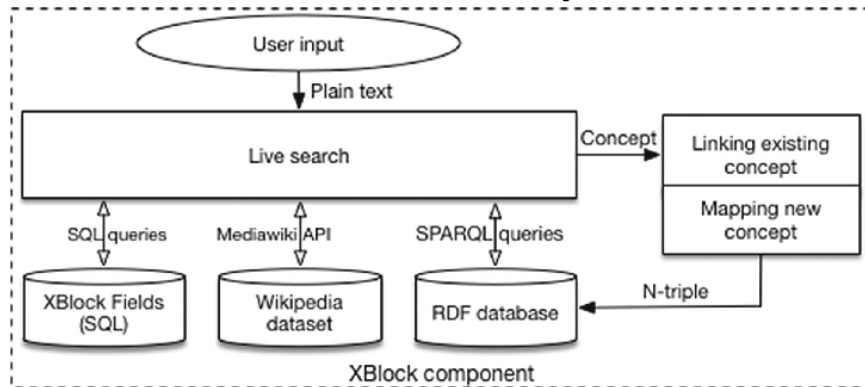## Built around a cooperative database







*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
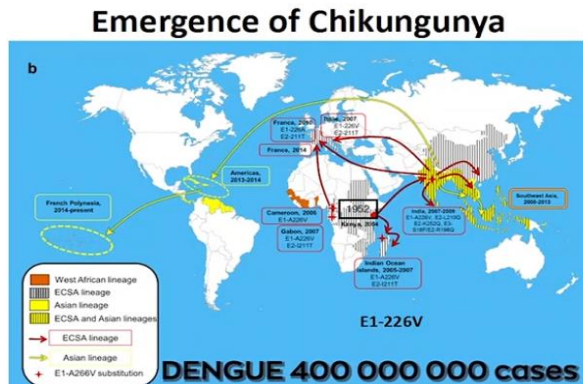
Downes, 2022, Data Literacy MOOC
https://data.mooc.ca

https://www.youtube.com/playlist?list=PLeBQHgzQN9x3Ro289GA7IPaJLdXwxXtLp

# Live-Linked Data MOOC (ldMOOC)

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



Emergence of Chikungunya
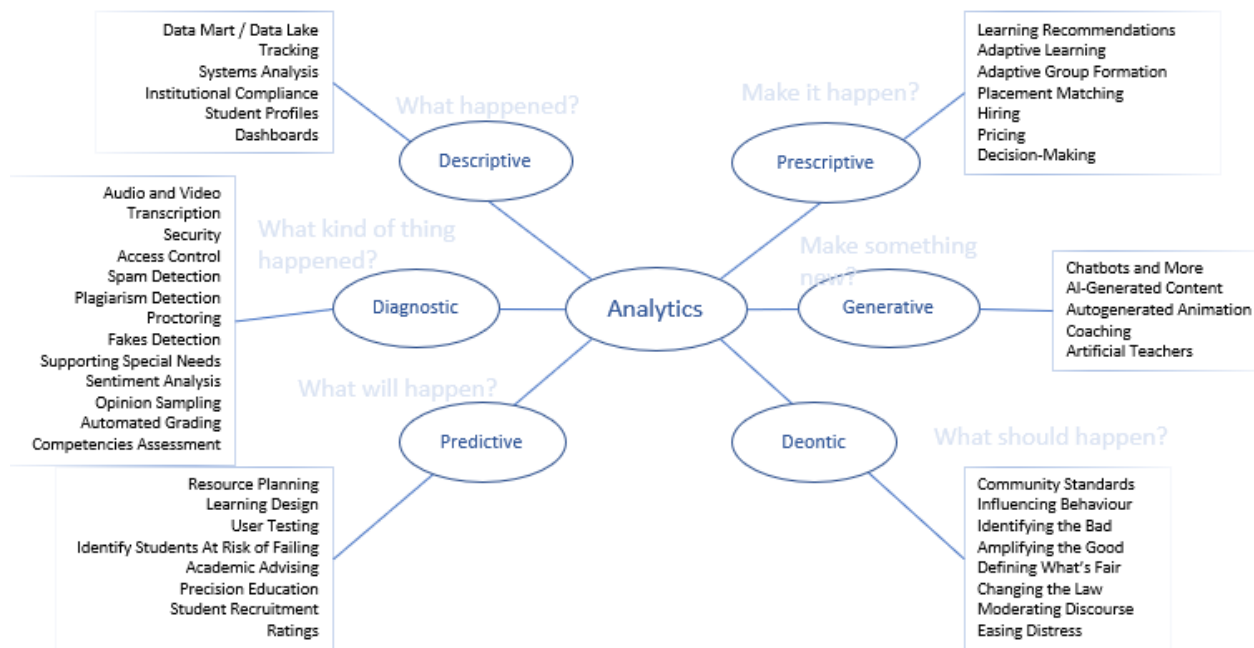
E1-226V

DENGUE 400 000 000 cases

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.
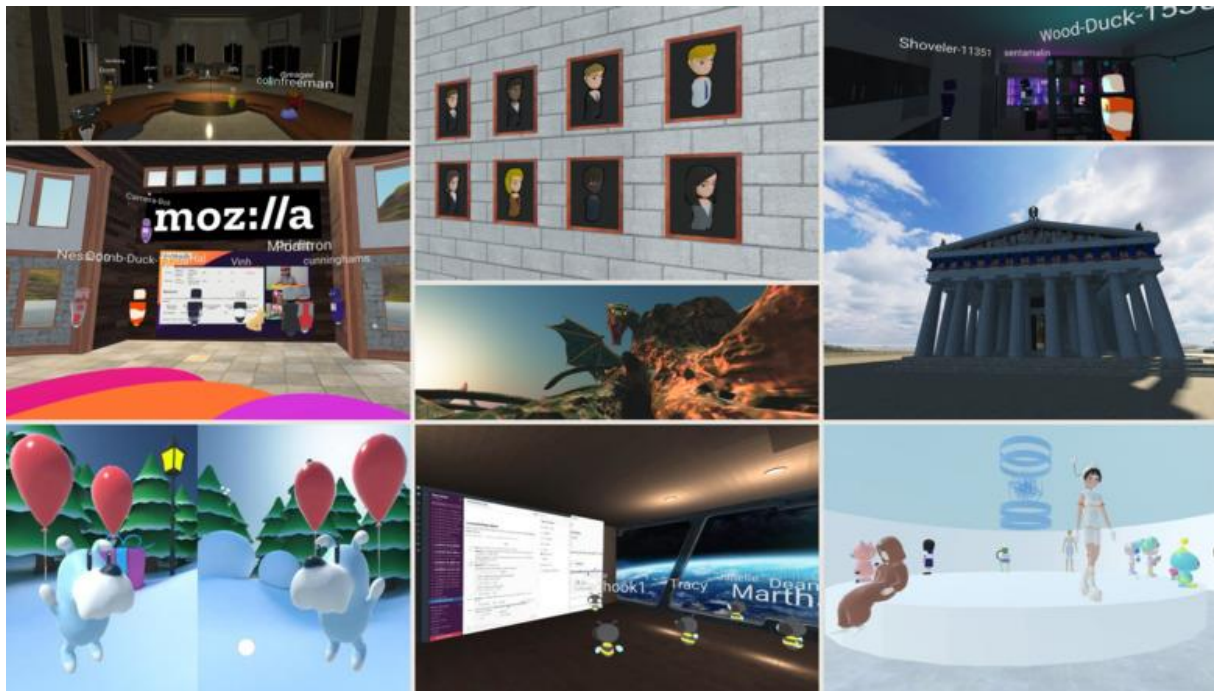
FUN MOOC – Medical Entomology
https://www.dailymotion.com/video/x6yh8mo

# AI-Supported MOOC (aiMOOC)



Artificial Intelligence in e-learning,

https://ethics.mooc.ca/

# 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

# Defining the Multiverse

- VR (Virtual Reality) uses a headset or viewing device l

- 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