
Pathways to Open Science

[Daniel Mietchen](#) - IGB Open Science Week 2021 - 18 November 2021
DOI: [10.5281/zenodo.5667649](https://doi.org/10.5281/zenodo.5667649)

Structure of the session (1)

- You can change the content or order of the slides

Pathways to Open Science

Structure of the session (1)

Structure of the session (2)

Video intro (1)

Open research vs. open science vs. open scholarship

What are we talking about?

Video intro (2)

Research cycle (1)

Research cycle (2)

Practical example

Sharing presentations (1)

Sharing presentations (2)

Sharing grant proposals (1)

Sharing grant proposals (2)

Sharing pictures or media files (1)

Sharing pictures or media files (2)

Sharing observations (1)

Sharing observations (2)

Sharing ideas (1)

Sharing ideas (2)

Sharing feedback (1)

Sharing feedback (2)

Several possible pathways to openness

Structuring our thoughts on open science (1)

Structuring our thoughts on open science (2)

Structuring our thoughts on open science (3)

Learning by observation

Learning by doing

Acknowledgments

Discussion

Query (1)

Query (2)

Query (3)

Query (4)

Query (5)

Structure of the session (2)

- Brief intro to open science
- Surface anatomy of the research cycle
- The ecosystem around the research cycle
- Opening individual aspects this ecosystem
- Pathways to openness, by stakeholders
- Active groupwork
- Changing perspectives: meta-science
- Discussion as we go

Video intro (1)



https://en.wikipedia.org/wiki/Open_research

Open research vs. open science vs. open scholarship

- Open governance
- Open workflows
- Open documentation
- Open for scrutiny
- Open for criticism
- Open for suggestions
- Open for contributions
- Open for collaboration
- Open for multiple perspectives
- Open for reuse
- Open licenses
- Open formats
- Open standards
- Open boundaries
- ...

What are we talking about?

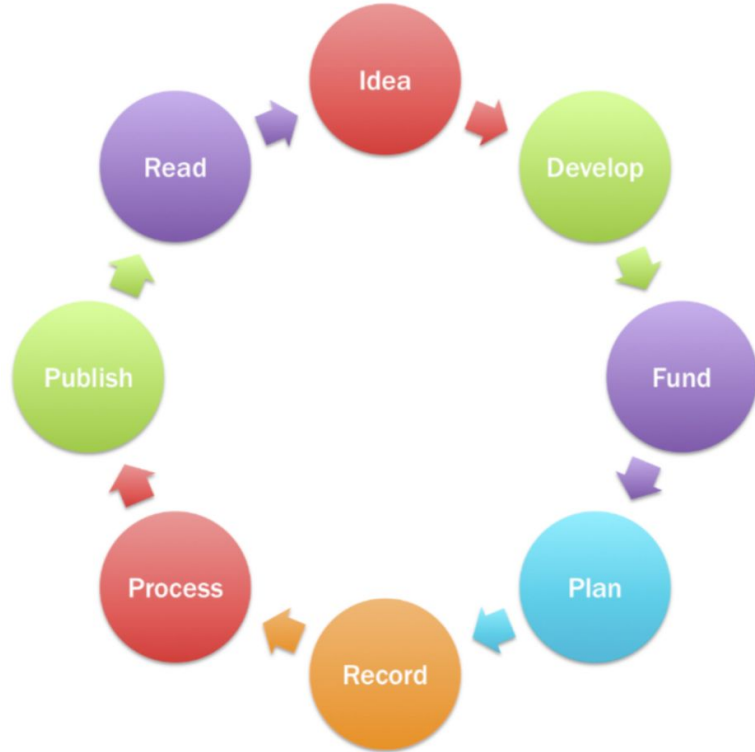
- Transitioning to open science does **not** mean that
 - All of us (researchers / institutions)
 - have to open all aspects of
 - all our lines of research
 - immediately
 - forever
- It **does** mean that we change the current situation in which
 - Almost all of us
 - Keep almost all aspects of the process
 - Of almost all our lines of research
 - Closed (to the public / competitors / collaborators / reusers)
 - At least until “publication” and often essentially forever

Video intro (2)

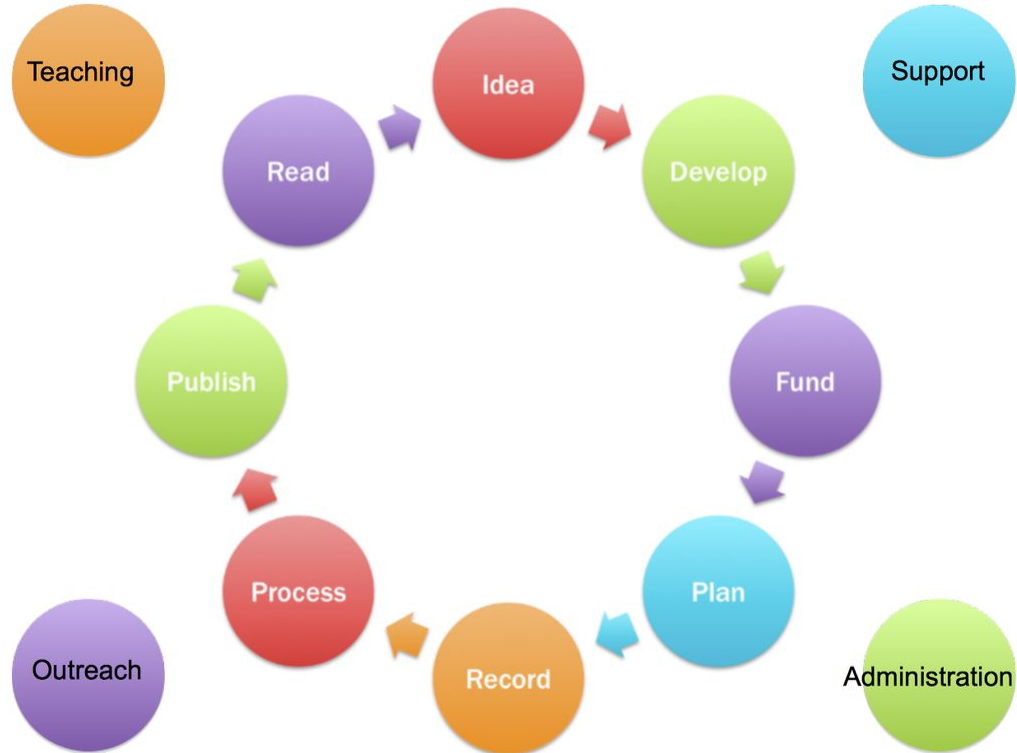
Open Science Summit 2011

- Event summary
 - “huge benefits to lurking”
 - tweet
 - “Putting mathematicians together in a room is a recipe for awkwardness. Give them a math problem, and they'll enjoy it.”
 - tweet
 - What about ecologists?
 - What if room is remote?
- The invitation for the talk was triggered by a comment on a news piece

Research cycle (1)



Research cycle (2)



Practical example

This current presentation

- Has been announced in public:
<https://www.igb-berlin.de/en/event/igb-open-science-week-session-daniel-mietchen>
- Has a public version <https://zenodo.org/record/5667649>
- Has an active DOI <https://doi.org/10.5281/zenodo.5667649>
- There is some useful metadata deposited with the DOI
 - Including that it is available under [CC BY 4.0](#), i.e. [openly licensed](#)
 - See talk on open licenses at <https://doi.org/10.5281/zenodo.4001555>
- Comes with resources that can be collaboratively developed

Sharing presentations (1)

Things to consider:

- Interactivity of the session
- Audience at that one moment versus over time
- Reserve a Zenodo DOI
- Include DOI in presentation files
- Finish slides/ other materials
- Record yourself when doing a test run
- Upload files to Zenodo
- Activate DOI before talk starts
- Share link with audience and beyond
- Keep track of the recorded sessions you were involved in

Sharing presentations (2)

Some recent examples (more [here](#)):

- [Humanitarian Wikimedia](#) (Nov 22, i.e. next week, with slides and video)
- [Opening up the research process](#) (Nov 9)
- [Now that machine actionable DMPs are becoming available, what could we do with them?](#) (Nov 9)
- [Integrating Wikidata into education](#) (Oct 31)
- [State of WikiCite in 2021](#) (Oct 31)
- [Monitoring policy compliance with Wikidata and Scholia](#) (Oct 25)
- [Science GLAM and Open Science](#) (Oct 13)
- [Short introduction to ontologies](#) (Oct 5)
- [FAIR Ethics: Making Ethical Review Processes more Machine Actionable](#) (Sep 22)

Sharing presentations (3)

New approaches:



Sharing grant proposals (1)

Things to consider:

- Collaborators
- Competitors
- Research value
- Educational value
- Copyright
- Licensing
- Formats
- Metadata
- ...

Sharing grant proposals (2)

Some examples (more [here](#) and [here](#)):

- [Towards an open, zoomable atlas for invasion science and beyond](#)
- [Science and Management of Intermittent Rivers and Ephemeral Streams \(SMIRES\)](#)
- [DNAqua-Net: Developing new genetic tools for bioassessment and monitoring of aquatic ecosystems in Europe](#)
- [Tracking Invasive Alien Species \(TrIAS\): Building a data-driven framework to inform policy](#)
- [PESFOR-W: Improving the design and environmental effectiveness of woodlands for water Payments for Ecosystem Services](#)
- [Increasing understanding of alien species through citizen science \(Alien-CSI\)](#)

Sharing grant proposals (3)

New approaches:



Sharing pictures or media files (1)

Things to consider:

- Research value
- Educational value
- Copyright
- Licensing
- Formats
- Metadata
- ...

Sharing pictures or media files (2)

Some examples (more [here](#)):



Sharing pictures or media files (3)

New approaches:



Sharing observations (1)

Things to consider:

- Research value
- Educational value
- Copyright
- Licensing
- Formats
- Metadata
- ...

Sharing observations (2)

Some examples (more [here](#)):

- [Nematus ribesii?](#)
-

Sharing observations (3)

New approaches:



Sharing as individuals (1)

Things to consider:

- Research value
- Educational value
- Personal information
- Own rights versus rights of others
- Licensing
- Formats
- Metadata
- ...

Sharing as individuals (2)

Some examples (more here):

- <https://github.com/Daniel-Mietchen/pledges>
-

Sharing as individuals (3)

New approaches:



Sharing as groups (1)

Things to consider:

- Research value
- Educational value
- Personal information
- Coordination
 - Social norms
 - Communication
- Licensing
- Formats
- Metadata
- ...

Sharing as groups (2)

Some examples (more here):

- <https://freeourknowledge.org/>
-

Sharing as groups (3)

New approaches:



Sharing as institutions (1)

Things to consider:

- Research value
- Educational value
- Personal information
- Coordination
 - Policies
 - Infrastructure
 - Communication
- Licensing
- Formats
- Metadata
- ...

Sharing as institutions (2)

Some examples (more here):

- Montreal Neurological Institute
 - Open Science at an institutional level: an interview with Guy Rouleau. Genome Biol 18, 14 (2017). <https://doi.org/10.1186/s13059-017-1152-z>
- Sicco de Knecht, Martijn van der Meer, Loek Brinkman, Manon Kluijtmans, & Frank Miedema. (2021). Reshaping the Academic Self: Connecting Education & Open Science (Version 2). Zenodo. <https://doi.org/10.5281/zenodo.5345573>
- Demo: <https://myresearch.institute/>
- Open and FAIR science in an institutional context. <https://doi.org/10.5281/zenodo.4720432>

Sharing as institutions (3)

New approaches:

- What about selecting some pilot projects to get institutional support on the premise that the pilots are being conducted entirely in the open?
-

Sharing ideas (1)

Things to consider:

- Research value
- Educational value
- Copyright
- Licensing
- Formats
- Metadata
- ...

Sharing ideas (2)

Some examples (more here):



Sharing ideas (3)

New approaches:



Sharing feedback (1)

Things to consider:

- Research value
- Educational value
- Copyright
- Licensing
- Formats
- Metadata
- ...

Sharing feedback (2)

Some examples (more here):



Sharing feedback (3)

New approaches:



Several possible pathways to openness

- Start by
 - Structuring our thoughts on the matter
 - Learning by observation
 - Learning by doing

Structuring our thoughts on open science (1)

- By ourselves

Structuring our thoughts on open science (2)

- Through literature

Structuring our thoughts on open science (3)

- Through training resources
 - Open research video
 - Maybe adapt existing training resources to become more open

Learning by observation

- looking around to see how others are doing
 - Open research
 - Open X
 -

Learning by doing

- Open X vs. open research
- looking around to see how others are doing it
 - reusing open research resources
 - methods, materials, software, data, ...
 - taking notes on what could be improved
 - contributing to someone else's open project (research or not) by
 - reviewing what they do
 - contributing to the project
 - trying to reproduce some aspect of it
- Opening some of our research
 - One of our research projects
 - as individual / group / institution
 - Immediately / with some embargo / retroactively
 - One aspect of one of our research projects
-

Acknowledgments

- Open communities and infrastructures we have built on and learned from
 - Wikipedia ecosystem
 - Open Knowledge Foundation
 - Mozilla
 - Linux
 - Python

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Discussion

For further questions, consider

[Ask Open Science](#)

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Quarry (1)

- [UNESCO on Open Science](#)
 - Audience engagement
 - Mentoring
 - Structural Genomics
 - Open Zika
 - Publishing
 - Manuscript submission / preprint
 - Public comments on one's notes / ideas
 - [Pledges](#)
- Event summaries can also be [blogged](#) or published ([BDJ](#)/[RIO](#))
 - ["Open data matters most when the stakes are high"](#)

Quarry (2)

- [JOGL](#)
- Citizen science
 - IGB-native
- Bürgerforschungsschiff Halle
 - <https://www.science2public.com/portfolio-item/make-science-halle/>
- Paper is advertisement of scholarship
- Valid reasons for not sharing
- [Ask open science](#) / https://www.wikidata.org/wiki/Wikidata:Wikidata_curricula/Activities
- MNI / CRI / African Open Science Platform
- Utrecht / Maastricht / NL
- Open Source Malaria

IGB-native open-source projects

URL shortener for IGB URLs?

[Bug reports to science](#)

[Open.Make](#)

Quarry (3)

- [LIGO Binder](#)
 - [NASA Open Science Initiative](#)
 - Open Science / Science GLAM - see talk <https://doi.org/10.5281/zenodo.5535597>
 - [FossiLab](#)
 - Wikimedia as a key component of the open science landscape
 - Talk at <https://doi.org/10.5281/zenodo.4321982>
 - [Invest in open](#) (infrastructure)
 - [OpenWetWare](#)
 - Allourideas
 - [AhaSlides](#)
- ["This revolution will be digitized"](#)
 - "an article about [a] computational result is advertising, not scholarship. The actual scholarship is the full software environment, code and data, that produced the result." (John Claerbout, quoted in [Donoho 2010](#))
 - Scicomm is often advertisement for papers / grant awards

Quarry (4)

- Journal clubs
 - Teaching
 - DFG-Nachwuchsakademien
 - Offene Leuchttürme
 - [Public peer reviews](#)
 - [Learning Dutch](#)
 - Intermediate results
 - Metadata for a set of 100 publications from the field of invasion biology.
<https://doi.org/10.5281/zenodo.5565037>
 - 1000 Disease Ontology terms and their Wikidata mappings to 17 mostly Indian languages and English <https://doi.org/10.5281/zenodo.3666921>
 - Profile pages - add picture, interests; avoid them getting stale; ORCID
 - Curate the scholarly literature
- [Cinema.md](#)
 - Institutional feeds
 - <https://myresearch.institute/>
 - Policy development in the open
 - <https://github.com/WhiteHouse/source-code-policy>
 - Some stuff from the German Reproducibility day
 - [https://pad.okfn.de/p/German Reproducibility Day](https://pad.okfn.de/p/German_Reproducibility_Day)
 - <https://zenodo.org/communities/grn?page=1&size=20>
 - [ReproHack](#)

Quarry (5)

- [Framework for Open and Reproducible Research Training](#)
- Some dojo
- FAIR & Open - [FAIR Data EG](#)
- Crowdfunding
- Sharing code
- Sharing data
- Sharing material samples
- Sharing educational materials
- Sharing protocols
- Sharing standards
- Sharing ethics
-

Quarry (6)

- Problems with open science
 - General
 - Misaligned to perverse incentives that dominate the research landscape
 - Ethics processes are not open, so best practice around how to decide/ document/ teach what is sensitive data that cannot be shared is not readily findable
 - Blurred definitions
 - Open Definition
 - Open Science / Research / Scholarship
 - Open Science is just Science
 - Open Science is more than just open access to the final thing
 - Open != FAIR
 - Specific
 - In some cases involving human subject research, it would be methodologically problematic if the studied people knew too much about the research