Maximizing research impact via practicing openness

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Contents:

History of Sharing Information:

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Writing and the Alphabet:

(~3000 BCE)

- ✓Recording of knowledge

The Printing Press:

(1440 CE)

- ✓Birth of books & peer-reviewed journals

The Industrial Revolution

(1760–1840 CE)

- ✓Improved printing & access to global libraries

The Computer Revolution

(1940s–present)

- ✓Enable Digital Data sharing despite high cost

The Internet and Digital Connectivity

(1990s–Present)

- ✓**Revolutionized scholarly communications**
- ✓ **Enabled instant connection**
- ✓ **Enhanced Global collaborations**
- ✓ **Broadening publications**

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Any Problem?
Many!

Overemphasis on paper, but lack of Reproducibility
- Many studies could not be replicated due to lack of detailed info

Competitive citation index
- citation-driven culture, lead to manipulations and biased reviews.

Quantity Over Quality
- Institutions prioritize publication counts for rankings, reducing research care.

Positive Result Bias
- Negative or unexpected results was ignored or leads to change the pintail Plan!

Limited Access
- Paywalls restrict research access, especially in low-income regions.

Rise of Science Denial
- Lack of transparency and accessibility fuels skepticism and mistrust in science.

As strongly requested by the reviewers, here we cite some references [[35], [36], [37], [38], [39], [40], [41], [42], [43], [44], [45], [46], [47]] although they are completely irrelevant to the present work.

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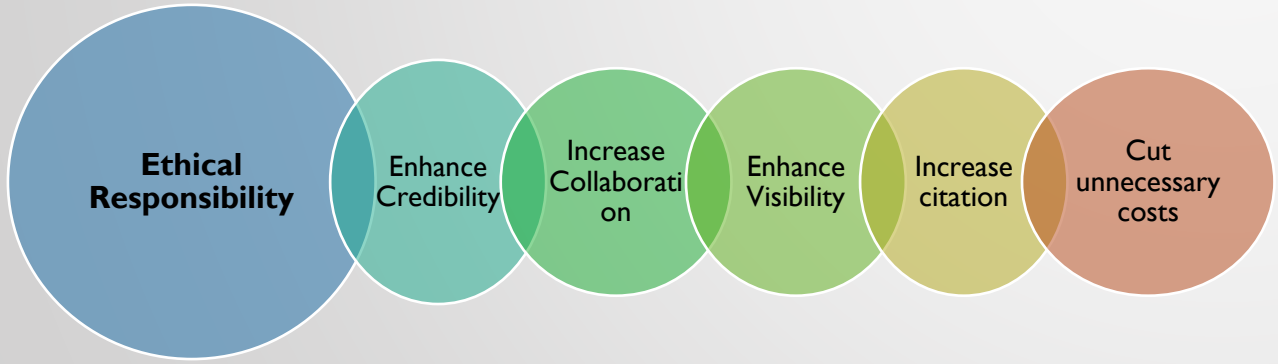
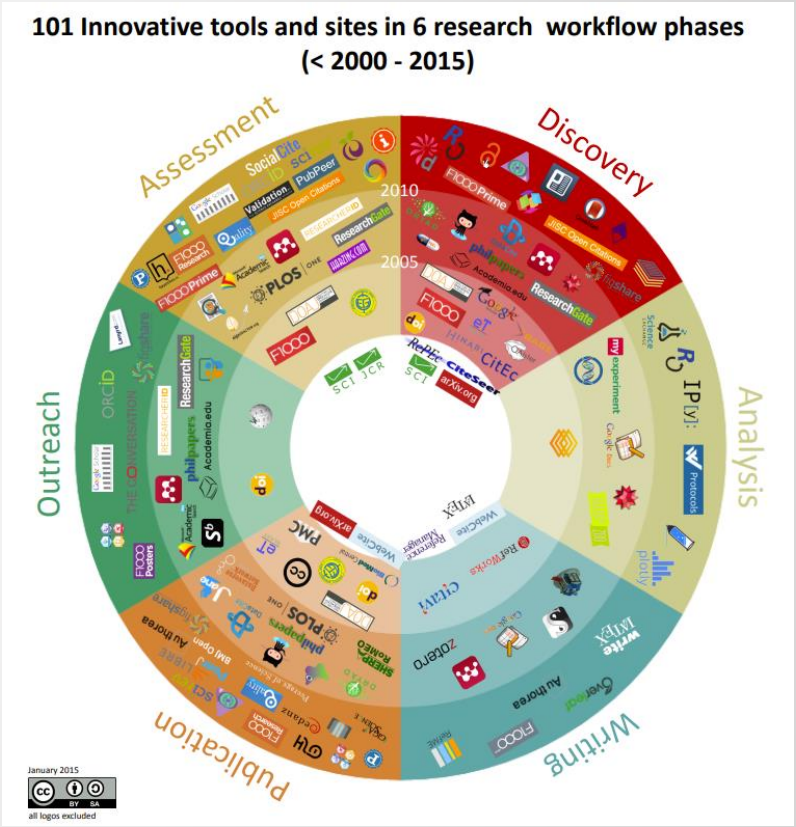
Any Solution?
Practicing Openness!

Practice preparing and sharing other type of research outputs, applying an Open access license and ensuring alignment with the principles of Transparency, Accessibility, and Collaboration.



Ref: McKiernan, Erin C., et al. "How open science helps researchers succeed." elife 5 (2016): e16800. DOI: https://doi.org/10.7554/eLife.16800



Bosman, J., & Kramer, ofB. (2016). Innovations in scholarly communication - data the global 2015-2016 survey [Data set]. Zenodo. https://doi.org/10.5281/zenodo.49583

Various tools to practice openness thorough out your reserch!

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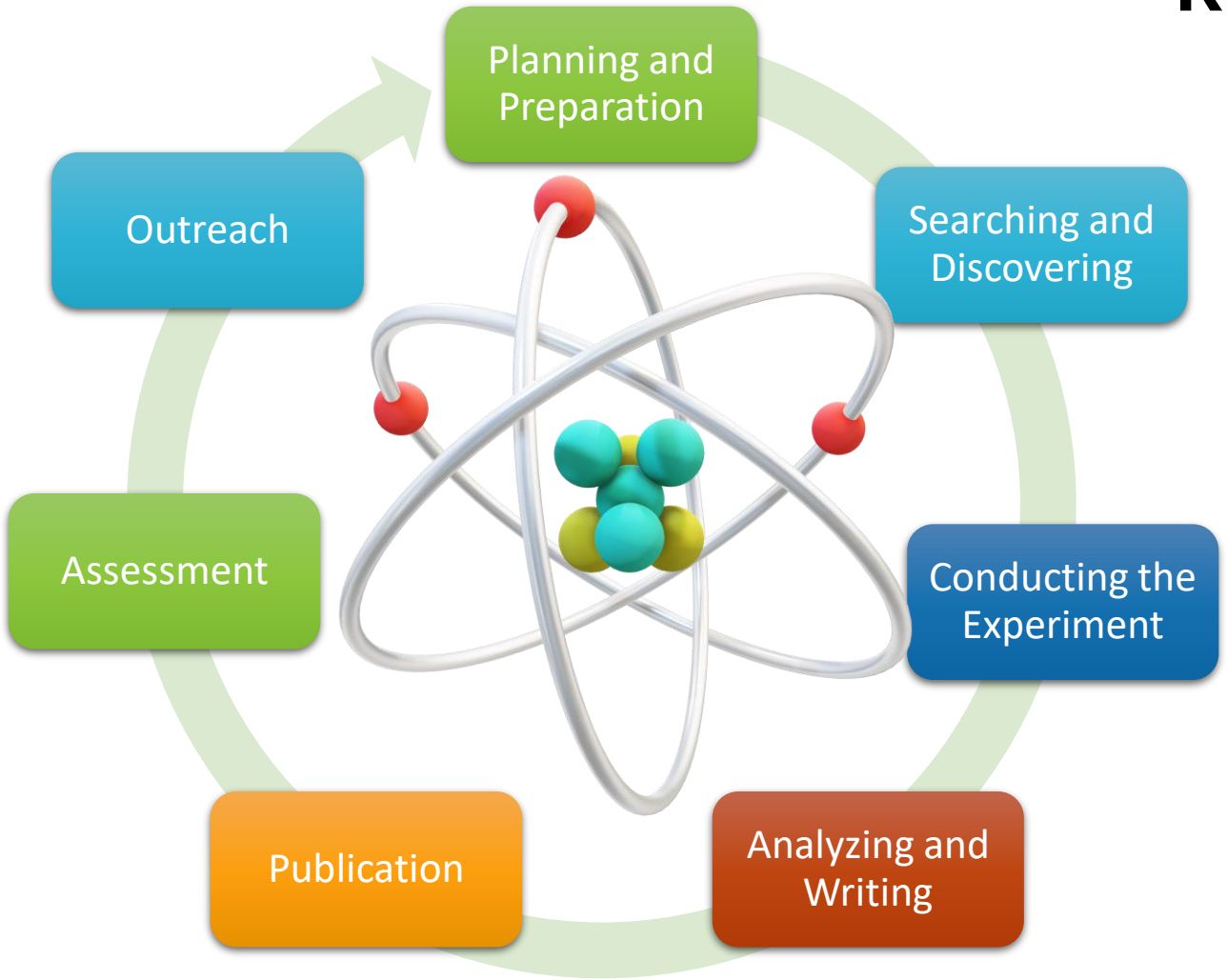
Boost Your Research Impact Throughout The Research Lifecycle:

Plan for sharing the other research outputs at any time of the research lifecycle to boost visibility, foster collaboration, and enhance your overall credibility.



Seven stages in a reserch lifecycle

1) Planning & Preparation:

Before starting your research: Check the open policies set by your funder to ensure compliance. Pre-register your research plan and protocol, choosing the level of access that suits your needs. Develop a DMP to structure your data lifecycle. Integrate the FAIR principles into your data and metadata by identifying best practices within your field. (If you find this process challenging, refer to the cheat sheet provided later in the presentation for guidance.)

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Check requirements for Open policies	Many funders and institutions, especially public ones, strongly support open access policies for various research outputs.
Create a Detailed Study Plan & Protocol	Open tools for documenting design and methods (e.g., protocols.io , osf.io).
Share the Plan & Protocol by pre-registering it!	Register research edit but of your study to prevent hypothesis changes (e.g., aspredicted.org , osf.io). The registered plan can not be edit but can be private until the process is completed and then can be link to the published outputs.
Develop a Data Management Plan (DMP)	DMP cover entire lifecycle of data, from planning to conducting and back up, long term preservation. Tools to create DMP (dmponline.dcc.ac.uk , argos.openaire.eu/splash/)
Plan to apply FAIR principle (Findable, Accusable, Interoperable, Reusable)	A case study on implementation of FAIR principles in the field of material science (https://zenodo.org/records/14224160) There is a "cheat sheet" in the post-publication phase that outlines key considerations for publishing data in alignment with the FAIR principle.

2) Searching And Discovering:

In addition to using institutional subscription databases, explore open-access repositories for literature, datasets, code, and software. Use tools like Zotero to organize and share literature collections and leverage Open Educational Resources. Ensure proper citation for any resources you use.

Use Open-repositories Database	Use open-access databases and repositories alongside your institutional databases (e.g., OpenAIRE Explore, CORE, arXiv). * Share your own collection of literature at zotero.org *Lithuanian National Repository: elaba.lt ,Search open literature:.lv
Use Open pre-registered Methods and Protocols	Access shared methodologies and protocols e.g., protocols.io/ , OSF: osf.io/.
Use Open Educational Resources	Use open lectures, tutorials, and materials (e.g., zenodo.Org/communities/eu/.
Use Open-Published DataSets	Use National repositories, google dataset search, data paper journals, generic repository, disciplinary repositories. Lithuanian Data archive - Biomedicine: midas.lt Lithuanian Data archive -SSH: lida.dataverse.lt/
Use Open-Source code, Software	Leverage platforms e.g github.com/ or gitlab.com for code and tools.

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3) Conducting the Experiment:

Use an electronic lab notebook to document your entire research process, making it easier to publish and share later. Properly organize and name your files and folders, ensuring detailed metadata to describe collected data. Store all data securely while keeping it accessible to your research team. If working with code or software, use open platforms to track changes throughout the process.

Well Documented Notes	Record procedures and deviations in electronic lab notebook system (e.g., https://www.elabftw.net/ , https://www.elabnext.com/we-are-now-elabnext Guide: https://doi.org/10.5281/zenodo.14224159
Well Documented Data	Organize and document data systematically following DMP standards For more info: how to name file and folders, What to include in Metadata (data about data), readme file. Standard formats.
Ensure Data Security	Use secure, backed-up systems for data storage (e.g., OneDrive)
Use tools for tracking changes	Employ version control for code changes (e.g., https://github.com/ ., https://docs.gitlab.com/ee/user/search/ , https://bitbucket.org/product/version-control-software)

4) Analyzing and Writing:

For data analysis, use free and open-source tools to enhance transparency and allow others to reproduce your work while contributing to open-source sustainability. Utilize open tools for visualization and writing to collaborate effectively with your team.

Use Collaborative Writing Tools	Google Docs, Microsoft 365, OneDrive for real-time collaborative document editing. GitHub, for code sharing, version control, and project management for developers More info: github.com/topics/writing-tool
Use Open-Source softwares	By using free and open-source tools you improve their sustainability. Open software: https://open-science-cloud.ec.europa.eu/resources/software Alternatives by Category: opensourcealternative.to/categories Free coerces for software use: zenodo.org/
Use Open-Source For Data Visualization	Data visualization tools, with or without programming language can be find in github.com/hal9ai/awesome-dataviz

5) Publication

At this stage, for scholarly publication, choose a diamond open-access journal from DOAJ and consider those with an open peer review policy for transparency. Publish your raw data as supplementary material, in a data journal, or an open repository, ensuring it has a unique identifier and is referenced in your manuscript before submission. Apply appropriate licenses to facilitate proper attribution and reuse.

Publish your Notebook and Workflow	Notebooks share e.g. openlabnotebooks.org/ Share workflows on platforms like Protocols.io
Find the right journal & walk the Diamond Path!	Search for Diamond Open Access journals (~platinum~non APC~no fee) in Directory of Open Access publishing
Select Journal with Open Peer Review policy	Choose journals with open peer review policies to share and publish review history for transparency.
Publish your Data	Data can be shared through supplemental materials in research articles, public websites, specialized repositories or as data papers in Data journals. (Dataverse, Dryad, figshare, Zenodo..)
Publish Code and Software	Share software for reproducibility on platforms like GitHub, GitLab, or Bitbucket.
Assign Appropriate Licenses	Apply licenses Use Open Data, Shared Data, or Closed Data licenses as needed. (e.g. chooser-beta.creativecommons.org/

Cheat sheets designed to assist in enhancing the FAIRness of research DATA and CODE!

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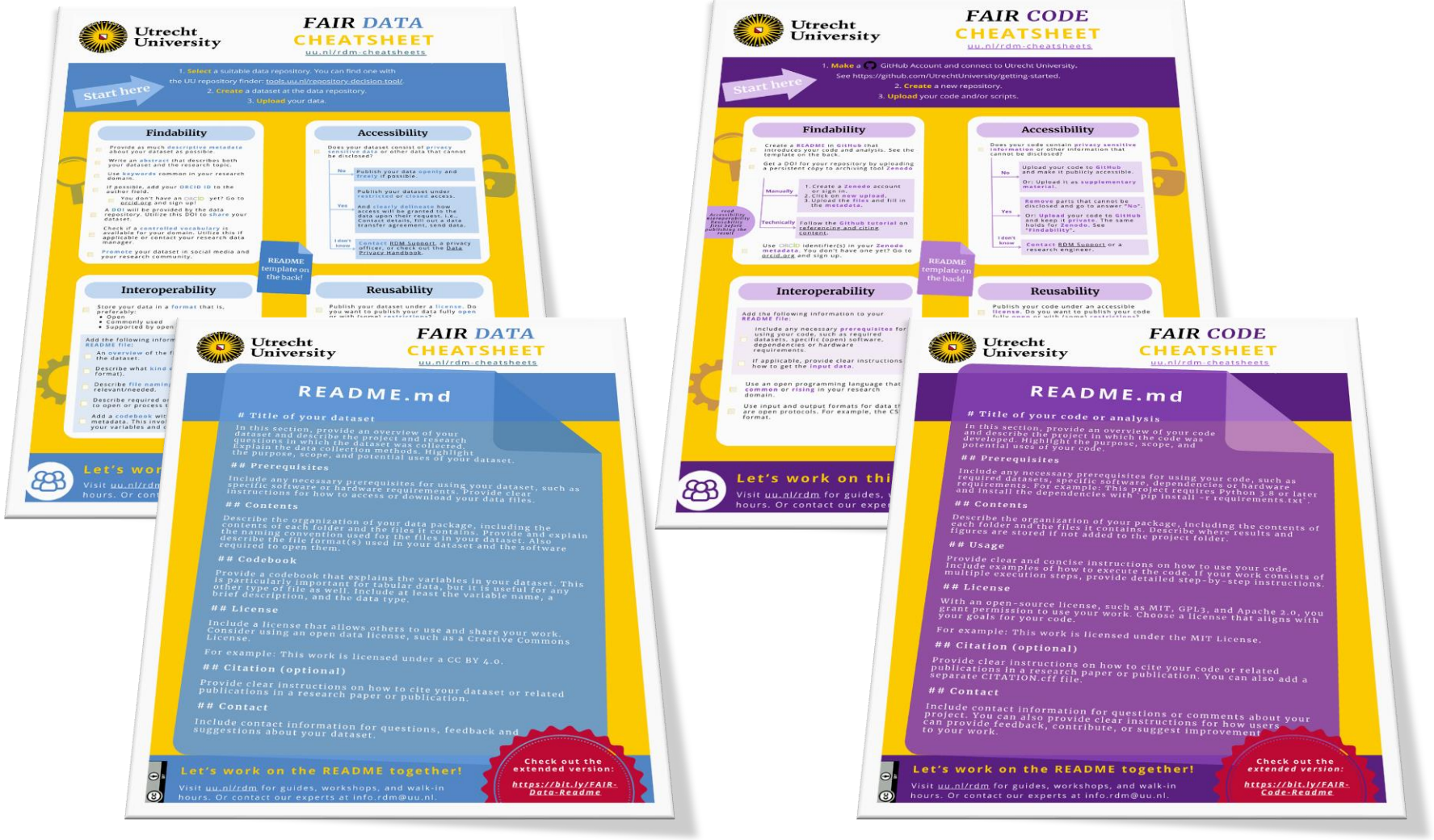
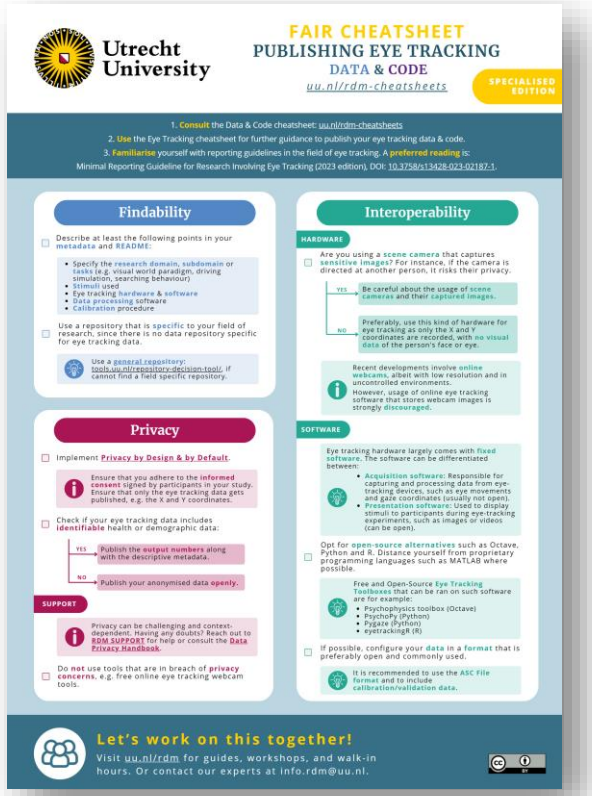
https://github.com/UtrechtUniversity/FAIR-Cheatsheets.git

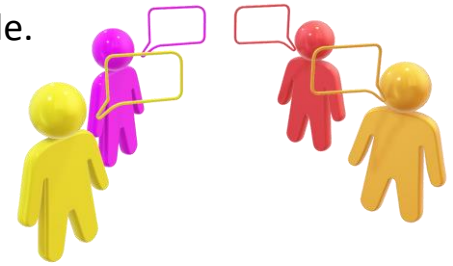




Use the Eye Tracking cheat sheet for further guidance to publish your eye tracking data & code!
https://github.com/UtrechtUniversity/FAIR-Cheatsheets.git

6) Assessment

Register for an ORCID account to link your research outputs and provide a brief description of your work there. Engage in open peer review by commenting on published research or preprints (early manuscript drafts shared before formal peer review). Preprints can be published anywhere that meets FAIR principles and reviewed on another platforms where reviews receive persistent identifiers, making them citable.



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Promote Visibility with unique identifier	Use persistent identifiers for yourself (ORCID), your articles (DOI), and your data (PID).
Comment and feedback on published articles	Engage with published work to discuss and provide open feedback. PubPeer.
Practice peer-review for more recognition	Review preprint drafts on platforms e.g. prereview.org/, Review Commons Share your preprint draft in: Review commons , peercommunityin, Or find the proper pre-print repository: doapr.coar-repositories.org/

Preprint and open peer review are reshaping scholarly communication by enabling researchers to share articles, data, and findings on Diamond Open Access platforms that follow FAIR principles. Reviews can occur on separate platforms where the reviewers receive persistent identifiers, making them citable and trackable. Researchers can also curate and endorse preprints independently, fostering a decentralized and transparent review system. While not yet fully integrated into research assessments, this model offers a more accessible, flexible, and collaborative alternative to traditional peer review, accelerating scientific dialogue.

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7) Outreach

Maximize your research impact by self-archiving in repositories, ensuring visibility and citation. Link posters and presentations with proper licensing and share findings via ResearchGate, ORCID, social media, and public talks. Engage with science deniers to address misinformation and contribute to Citizen Science projects, fostering public collaboration in research.

Link your poster& Presentations	Include a license logo, linking it to the license's official homepage.
Self Archive your work in a repository	Deposit your published work in institutional, generic or disciplinary and repositories Ensure they are discoverable, citable, and interconnected with related records.
Share through your Public Media	Disseminate research findings through research gate, ORCID, social media, blogs, and public lectures in accessible terms.
Stand for Science	Engage with science deniers and address misinterpretations of scientific claims, especially related to your reserch areas.
Participate in Citizen Science projects	Citizen science unites educators, data managers, scientists, and volunteers to work on scientific investigations of any number of important issues, such as climate change, biodiversity, and water quality.

Open Practice Advantages:

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- **Open sharing ensures reproducibility and trust.**
- Open Access makes knowledge equitable and inclusive.
- **Open peer review increases transparency.**
- Open Science shifts focus to impactful, transparent research.
- **FAIR data principles enhance collaboration and reduce waste.**
- Open Science values all results equally.
- **Open Science builds trust through accessibility and citizen engagement.**
- **Open results maximize public investment.**
- Preprints and open platforms accelerate communication.
- Policies and rewards encourage open practices.

McKiernan et al. eLife 2016;5:e16800. https://doi.org/10.7554/eLife.16800.001

Open Science Mushroom!

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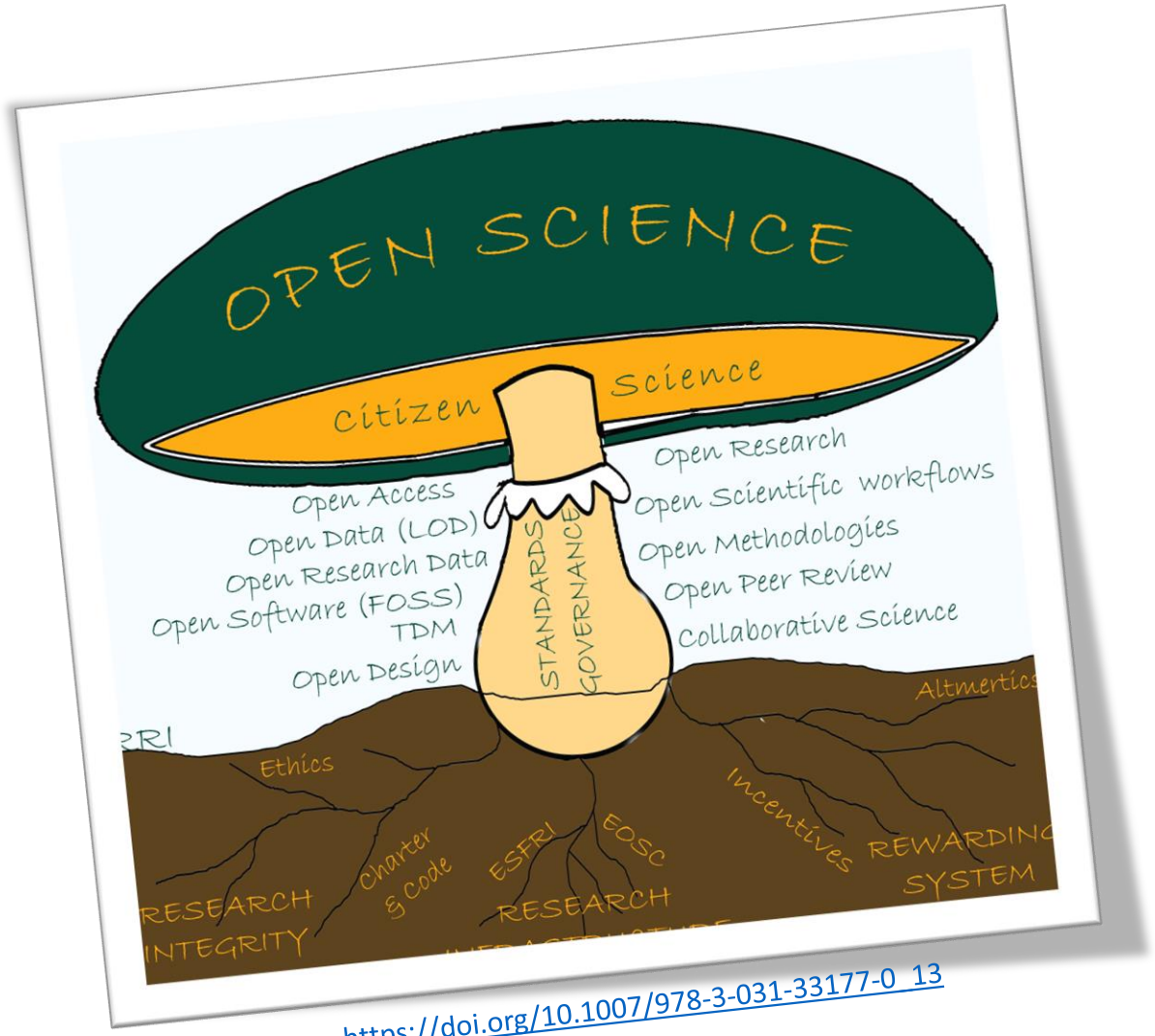
All these practices are under a mushroom CAP working together to build Open Science taxonomy, which the goal is to make publicly funded research benefit society as a whole ☺



https://doi.org/10.1007/978-3-031-33177-0_13

European Policies in Open Science

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OS practice in Horizon Europe	Horizon Europe mandates open access to publications and research data, following the principle of "as open as possible, as closed as necessary."
	These practices are outlined in the Horizon Europe Standard Application Form and the Programme Guide.
Incentives and Rewards	The European Commission promotes Open Science through policies like the Agreement for Reforming Research Assessment (ARRA).
Supportive Legislation	EU frameworks support open data, open access, and digital legislation conducive to research.
	nitiatives like the European Open Science Cloud (EOSC) and Open Research urope provide platforms and resources for open practices.

National policies: 2016, 2024	The Research Council of Lithuania (the main national funder) adopted Open Access guidelines to encourage open dissemination of research.
	The Research Council of Lithuania has created guidelines for Open Access to Research and Development Results. By 31 December 2026, institutions need to: 1) Set up ways to monitor open access to research results; 2) Develop a plan to ensure open access.
Institutional policies:	Kaunas University of Technology also have established Open Science policies.
OS projects 2021-2027	Lithuania's Ministry of Education, Science and Sports launched two programs to promote Open Science practices in year 2021 to 2027.
	Aim of these projects are to improve OS practices ar infrastructures in line with FAIR principles.

"As Open As Possible, As Closed As Necessary."

Instead of “publish or perish”, embrace “share and flourish”!

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