



The evolving research librarian: Emerging roles and responsibility in support of reproducible science

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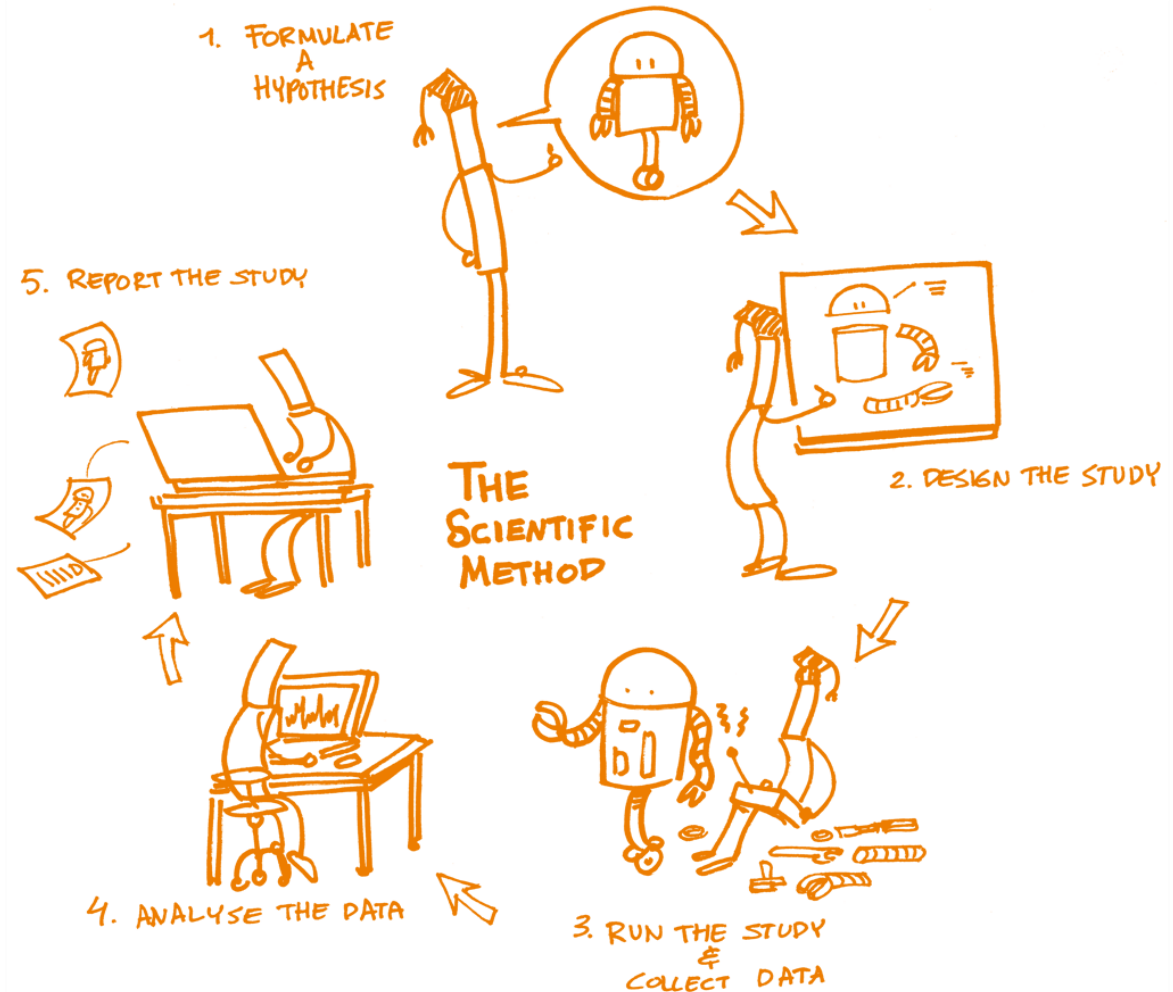
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About this activity



The Scientific Method revisited

“Open science refers to the process of making the content and process of producing evidence and claims transparent and accessible to others. Transparency is a scientific ideal, and adding ‘open’ should therefore be redundant. In reality, science often lacks openness [...].”
(Munafo et al., 2017; own highlighting)



Open science & Reproducibility

- Both aim at improving research practices, and have related but also different agendas
- **Open science / scholarship** aims at removing (access and other) barriers and making research more transparent (“**access crisis**”)
- **Reproducibility** aims at improving the reliability and transparency of research findings (“**trust crisis**”)
- Both add some work but also make research easier
- Similar benefits for researchers: better organization of own work and more efficient, increased impact and citation rates, research community and others can more efficiently build upon findings



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Project aims

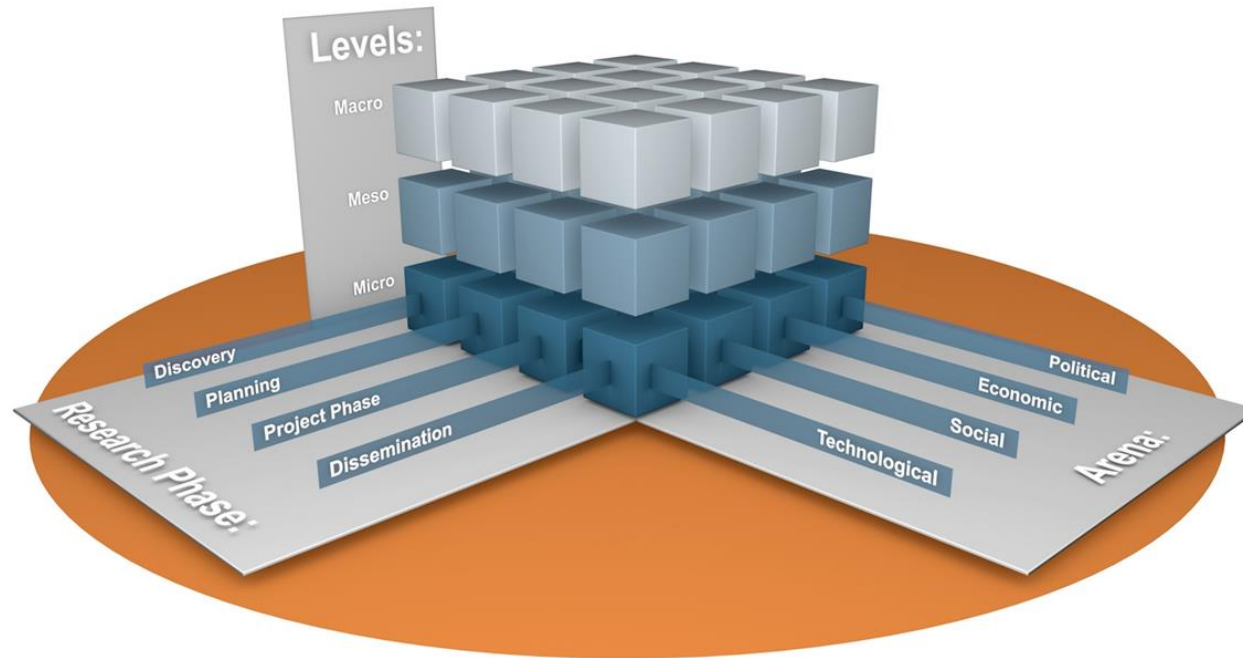


To explore **current practices and barriers** in the area of research reproducibility, with a focus on the **publication and dissemination** stage.



To compare and inspire **strategies, policies and operational practice** and **share lessons learned** from a wide range of stakeholder groups.

Applying the KE Open Scholarship (OS) Framework



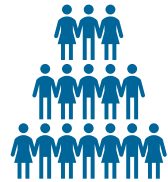
- In this project, we used the KE OS Framework as a lens to study research reproducibility, focusing on the “**dissemination**” end of the spectrum.
- The framework is helpful in identifying the appropriate stakeholders (at different levels), arenas and research phases.

Our approach



Literature review

Comprehensive literature review of **128 sources**, covering 7 disciplines and multidisciplinary sources



Stakeholder engagement

Engagement with **51 stakeholders** via interviews and focus groups



Thematic analysis

Thematic coding via NVivo of literature sources, interview and focus group transcripts



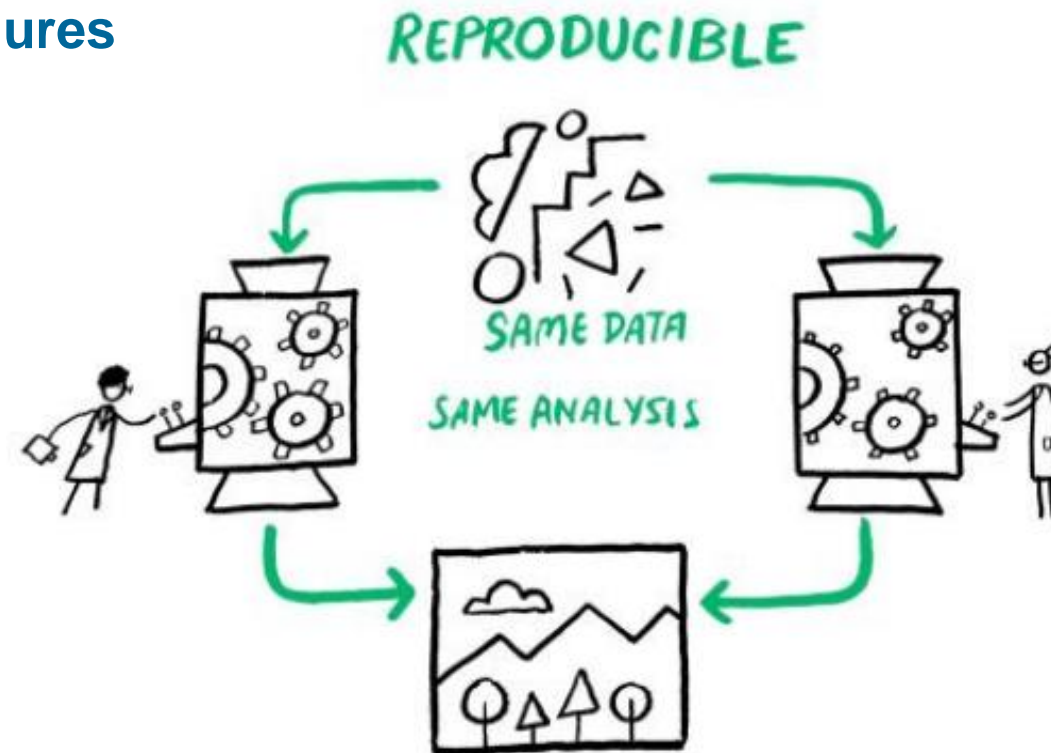
Social media analysis

Analysis of Twitter data to map the online reproducibility discourse

- Supporting data available at: <https://zenodo.org/communities/ke-prro>

Our definition of reproducibility

Using the **same data and procedures** (e.g. code) as shared by others to obtain the **same results** as in the original study.



CC BY. [10.5281/zenodo.3332807](https://doi.org/10.5281/zenodo.3332807)

The benefits of a practical and specific definition of reproducibility

- Helpful starting point for **awareness raising** and **teaching** efforts
- Makes the concept more **understandable** and any problems **easier to tackle**



“[Confusion around definitions] certainly creates friction in the sense of slowing down people understanding what each other means, and so there are a lot of terminologies that get generated making it seem like it’s more complicated than it is... that just makes it harder for people to talk to each other.”
Infrastructure provider

- But **inclusivity** is still important!

Why is supporting reproducibility important?

Individual benefits

- Avoid disaster and error
- Make time-savings
- Increase confidence in results
- Earn recognition and develop career

Community benefits

- Increase transparency for reviewers
- Increase credibility of published record
- Improve trust in academic research

In **principle** supporting the publication of reproducible research is a very good thing

In **practice** enabling reproducibility at the system level is quite a challenge

Five things you need to know to support reproducible research



- Reproducibility is part of the **vision for open science**, alongside concepts such as replication, robustness and the generalisation of research findings.



- **Stakeholder collaboration** is needed to continue developing reproducible publication practices.



- **Incentives for reproducible publication practices are currently limited.** Research performing organisations are beginning to support researchers in this area.



- The **management, curation and sharing of research data and methods** are necessary conditions for reproducible publication.



- Reproducible publication practices require a range of **interoperable technological solutions.**

The multistakeholder nature of challenges

- **Researchers and research groups** in their roles as authors and reviewers play a crucial role but have limited time, resources & incentives
- **Research performing institutions** can create requirements and incentives through policies, support measures and infrastructures (and access to external services)
>> currently very few incentives, limited training and support for researchers
- **Learned societies, reproducibility networks** can facilitate the discussion and develop and coordinate good practice principles
- **Publishers and journals** can establish basic requirement and support disciplines in communicating more specific requirements (e.g. data/code availability statements) and guidance for authors and reviewers (e.g. checklists) >> some progress but limited monitoring of compliance
- **Service providers** address steps in the research and dissemination workflow and offer solutions to specific aspects (e.g. publishing notebooks, reproducibility checks)
- **Research funders & policy makers** can create requirements and incentives through policies and funding calls, but also criteria of research evaluation (transparency, robustness, reproducibility)
>> currently only very few do so

Conclusions: Opportunities & challenges for research performing organisations and libraries

- **Build on former achievements** in terms of providing **support, training and infrastructures** for open access and research data management
- **Training & guidance can integrate aspects of reproducibility**, e.g.
 - basic data science skills (The Carpentries modules on data and software)
 - research data management, e.g. documentation and sharing of data and code
 - publishing: availability statements, basics of peer review
 - reproducibility hackathons (repro-hacks), in collaboration with researchers
 - guidance on tools that help to make research more reproducible
- **Amend institutional policies** in the next round of revisions (with reference to funder policies)
- **Expand job profiles**, e.g. of data stewards, data managers
- **Engage in discussion on incentives & recognition of achievements** (e.g. for data reuse, evaluation criteria)



Thank you!

More information:

<https://bit.ly/KEPRRORReport>

Continue the conversation:

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