Understanding Open Science: Opportunities, Challenges and Solutions

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Opportunities: A new «trust technology»

Commentary

Open Science: A New "Trust Technology"?

Science Communication
34(5) 679–689

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http://scx.sagepub.com
SAGE

Ann Grand[1], Clare Wilkinson[1], Karen Bultitude[2], and Alan F. T. Winfield[1]

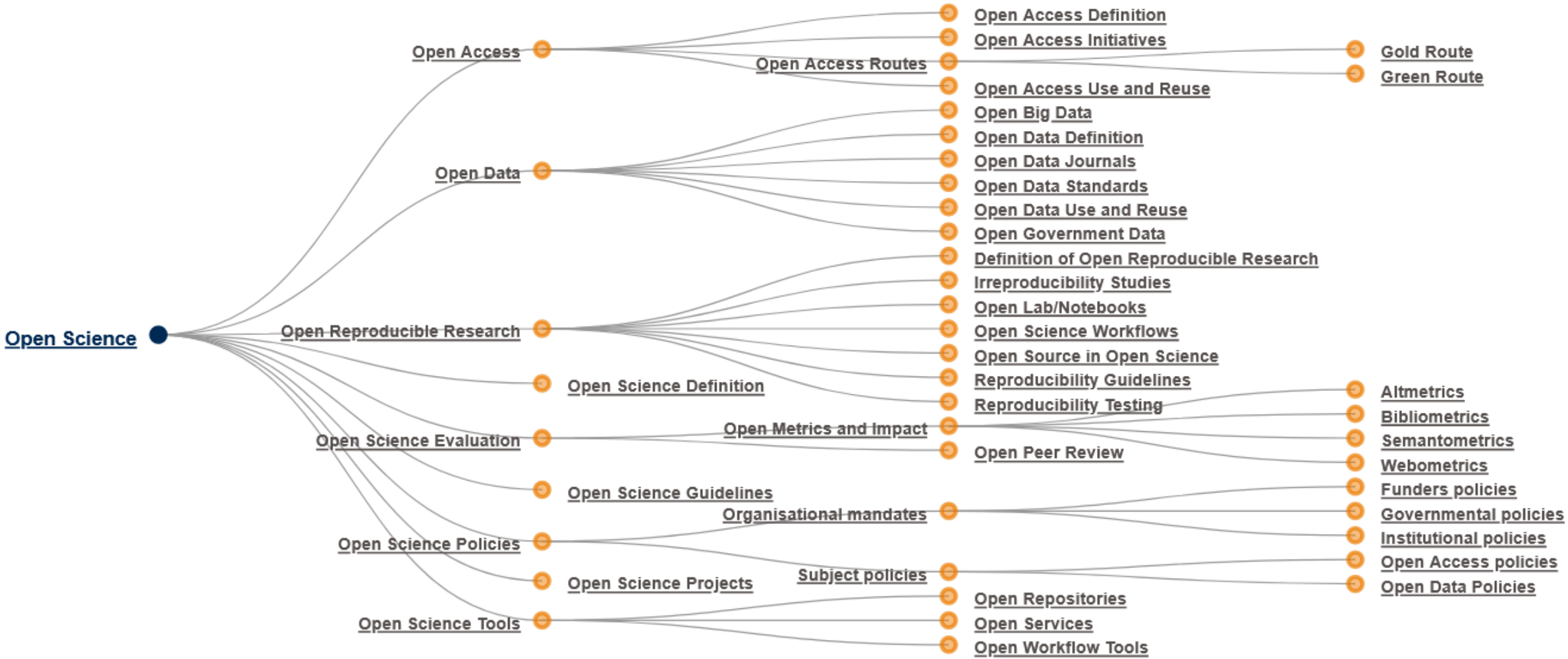
«The practice of open science could not only allow producers of information to map out their processes and contextualize their data, it could also support consumers in developing the critical awareness and judgment that enables us to separate pseudo-science from real. If it can achieve its aims of complete clarity and full publicly available content, open science has the potential to become a new trust technology, of benefit to both the scientific community and public groups.»

Grand, A., Wilkinson, C., Bultitude, K., & Winfield, A. F. (2012). Open science: a new "trust technology"?. *Science Communication, 34*(5), 679-689.

FOSTER

Click to download taxonomies

Open Science | Research Data Management | Legal Issues | Text And Data Mining | TDM Methods | Research Workflow | RRI



https://www.fosteropenscience.eu/taxonomy/term/100

Challenges

Social challenges

- Economic disparities
- Cultural differences
- Building a dialog with a public
  - Public (dis)trust in science
  - Misunderstanding of research and misuse of research results

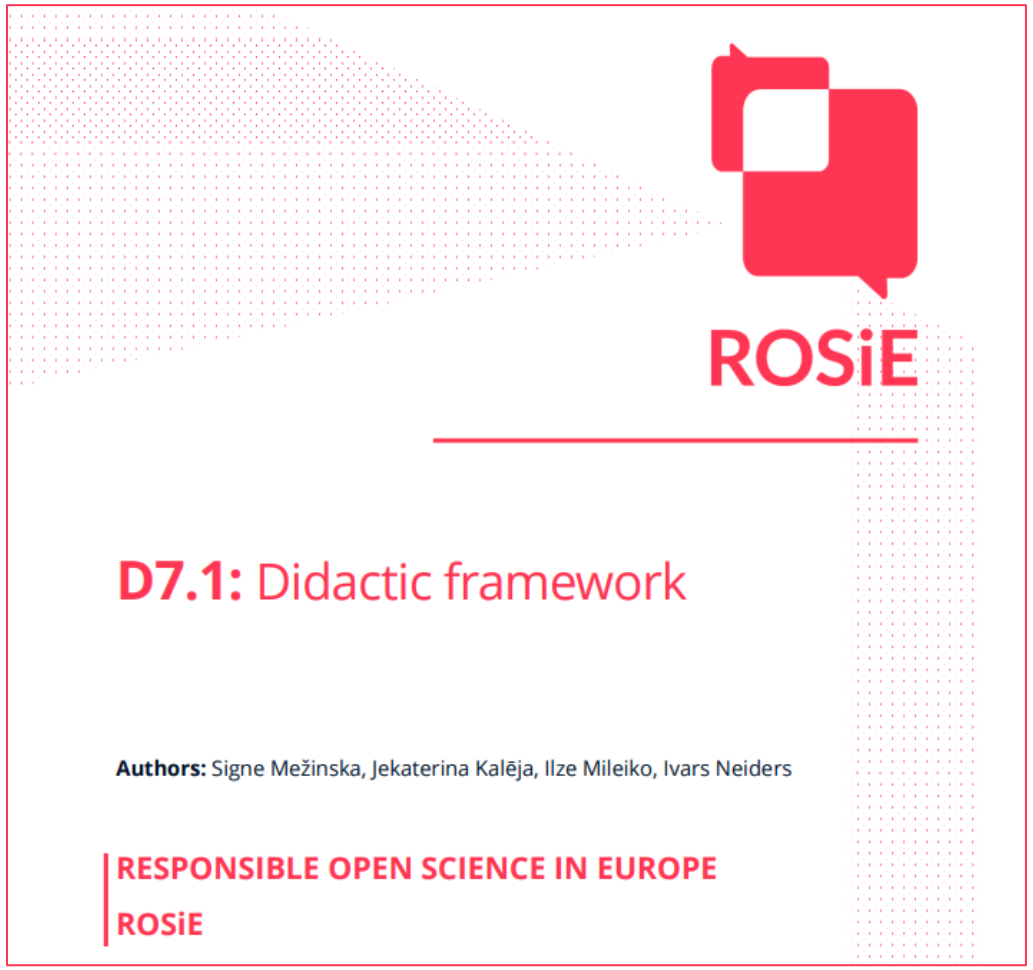
Social challenges

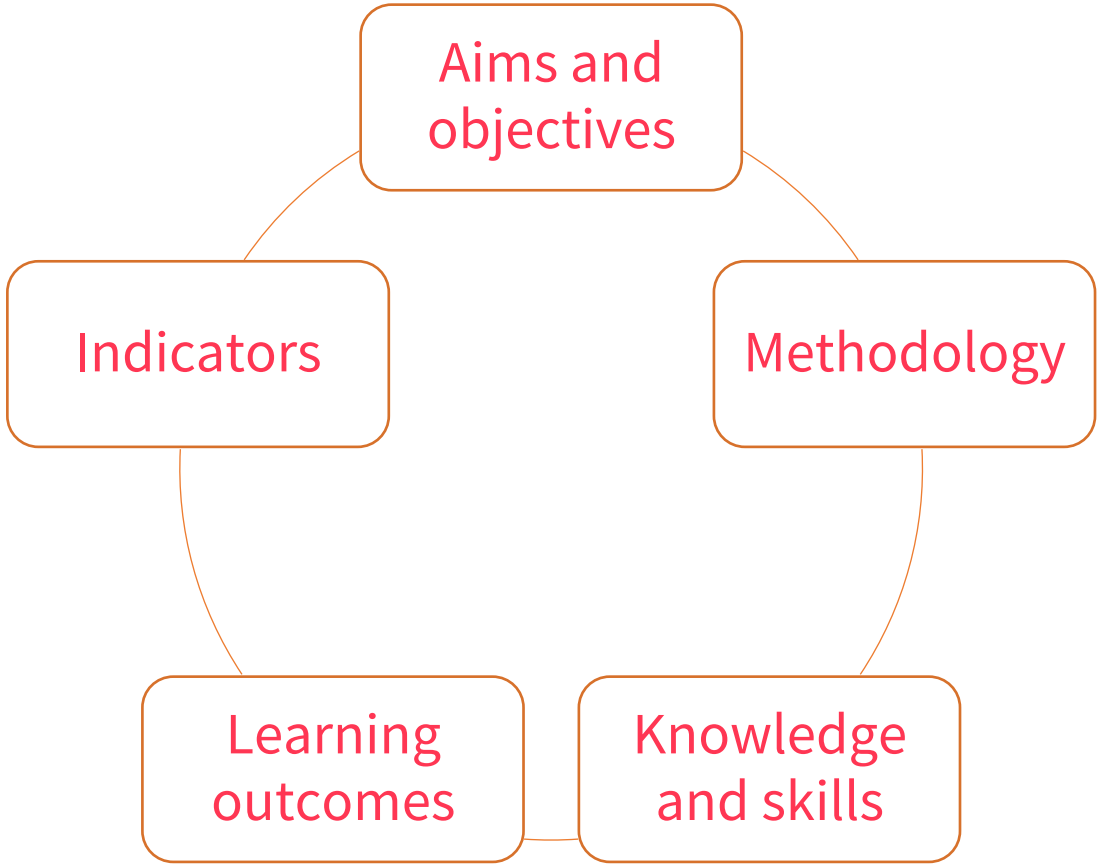
- Specific social challenges in scientific community
  - Hyper competition
  - Inequalities inside the scientific community
- Social challenges in the process of implementation of OS
  - Attitudes towards OS
  - Barriers for implementation of OS

Possible solutions

- Adapting the incentive systems and funding requirements
- Making adaptive adjustments to the impact metrics and peer review system
- Improving infrastructure and compensation to address skewed infrastructure effects
- **Training and education**

ROSiE training materials: Didactic framework





Skills and attitudes for responsible practising of OS

Local and global citizenship

- awareness of the importance and social benefits of OS and citizen science in local and global contexts
- participation in ethics and integrity self-regulation of OS and citizen science community

Personal and social responsibility

- personal and professional responsibility for implementation of OS and production of results
- openess to share own research data, results , tools and publications and appreciation of efforts of others

Skills and attitudes for responsible practising of OS

Epistemic skills

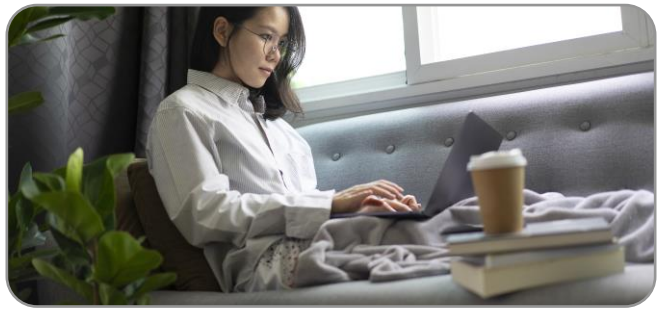
- ability to organize, present and use open data and knowledge with integrity
- ability to critically assess data, knowledge and scientific results produced by others
- ability to identify ethical and integrity issues in OS

Collaborative problem-solving

- ability to apply critical thinking skills in collaborative analysis of ethical and integrity problems in OS
- discussing, finding solutions and making desicions to handle ethics and integrity issues within OS community

Types of training materials

Traditional training materials



Online training materials for ENERI classroom

MOOC

Will be available by the end of 2024

Training materials

Case studies

Social sciences	Humanities	Health and life sciences	Natural sciences	Citizen scientists
Material for trainers + handouts, printouts and readings for trainees	Material for trainers + handouts, printouts and readings for trainees	Material for trainers + handouts, printouts and readings for trainees	Material for trainers + handouts, printouts and readings for trainees	Material for trainers + handouts, printouts and readings for trainees

INTERDISCIPLINARITY

Case collection

- 32 cases for classroom discussions
- 6 animated cases

Cases grouped on content

Field of science

Social sciences	2 5 6 9 12
Humanities	8 9 12 20
Health and life sciences	2 7 11 17 18 22 23 24 26
Natural sciences	10 13 14 19 27
Citizen science	1 3 4 7 10 21 22
Interdisciplinary	15 16 25 28 29 30 31 32

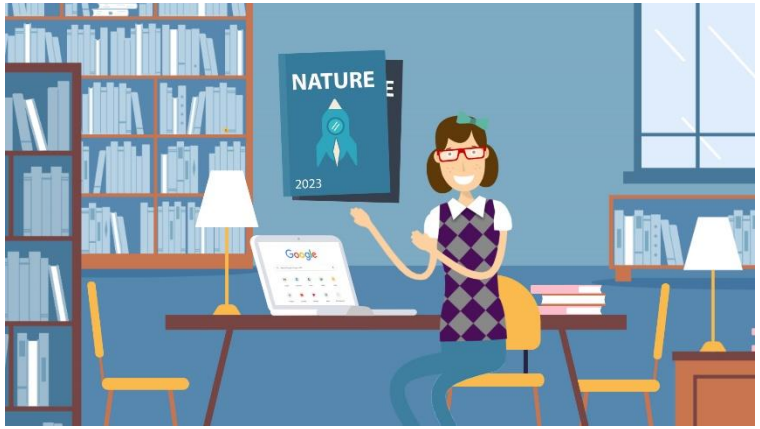
Stage of research

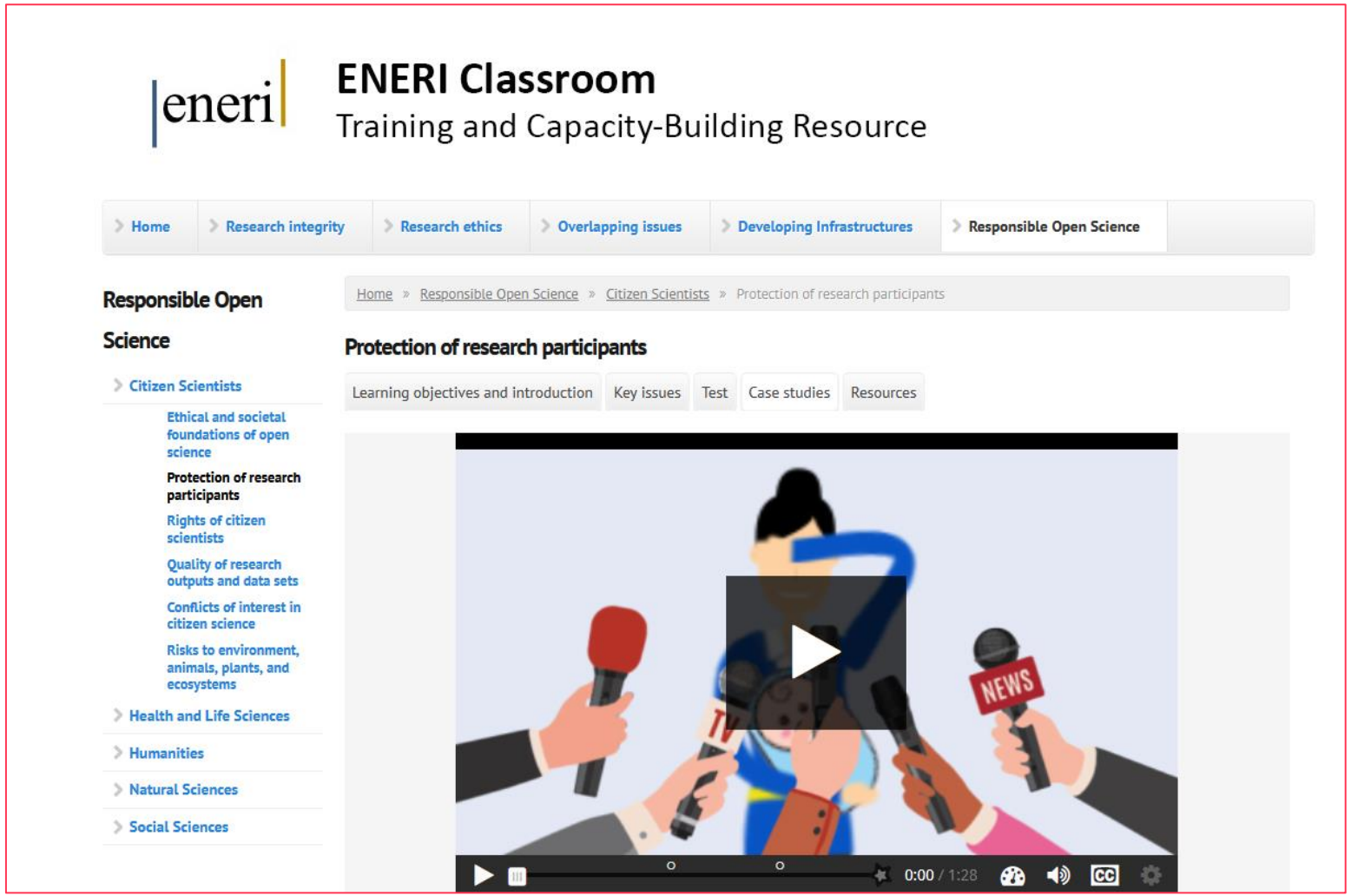
Data collection	1 3 4
Data sharing, using and reanalysis	2 5 6 7 8 9 11 12 14 15 16 17 18 19
Open publishing	20 23 24 25 26 27 28 29 30
Dissemination	31

Topic

Authorship	20 21 22
Conflicts of interests	1

Animated cases





ENERI Classroom: https://classroom.eneri.eu/node/82

Traditional training materials (ROSiE Knowledge Hub and Zenodo)

8 Units

The 8 Units build a full 2-days training course

1 to 3 Activities

Each Unit includes one to three alternative Activities. If there are two Activities, the trainer can choose the most appropriate for the audience

Handouts

Each Activity is supplemented by handouts, printouts and readings

Traditional training materials

Table of Contents

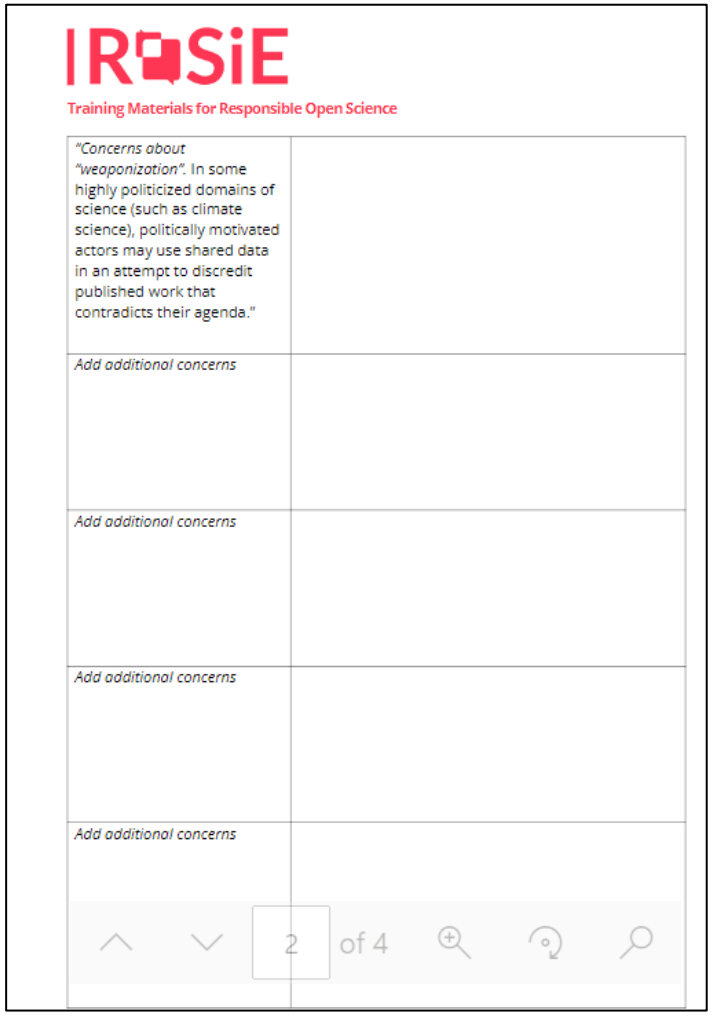
Example activity: Concerns to share and reuse data

IRoSiE

Training Materials for Responsible Open Science

TASK 1. SHARING YOUR RESEARCH DATA	
Concerns discouraging to share data	**Is this concern relevant for your group? What is needed to mitigate this concern?**
"Added effort and time. Organizing one's data for sharing can require a significant time commitment, depending on how they were initially organized."[1]	
"Lack of incentives. Many researchers feel that they will not receive suitable credit for sharing their data (for example, in the context of hiring or promotion), compared to other activities that they could instead engage in."	
"Potential to be "scooped". Some researchers worry that if their data are shared, other researchers may be able to ask the same questions that they wish to ask, and thus rob them of the priority on publishing those findings."	
"Concerns about errors being found. Researchers sometimes worry that sharing data could open them up to the possibility of others finding errors in their research."	

[1] The concerns are quoted from the Stanford Psychology Guide to Doing Open Science. Available at: https://poldrack.github.io/psych-open-science-guide/3_datasharing.html



Thank you!

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Thank you!

RoSiE

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