

Understanding Open Science: Opportunities, Challenges and Solutions

Signe Mežinska, University of Latvia

RSiE



Opportunities: A new «trust technology»

Commentary

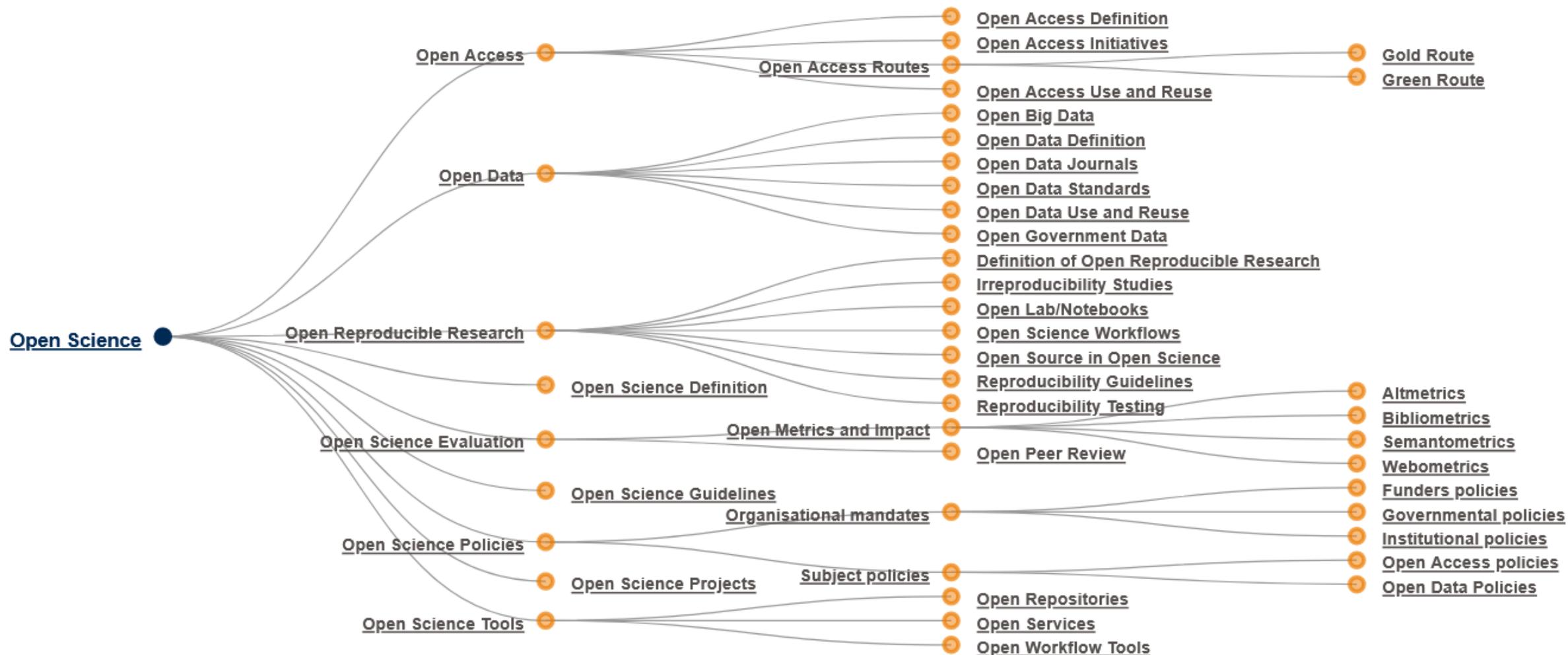
Open Science: A New “Trust Technology”?

Ann Grand¹, Clare Wilkinson¹,
Karen Bultitude², and Alan F. T. Winfield¹

Science Communication
34(5) 679–689
© 2012 SAGE Publications
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1075547012443021
<http://scx.sagepub.com>


«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.



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



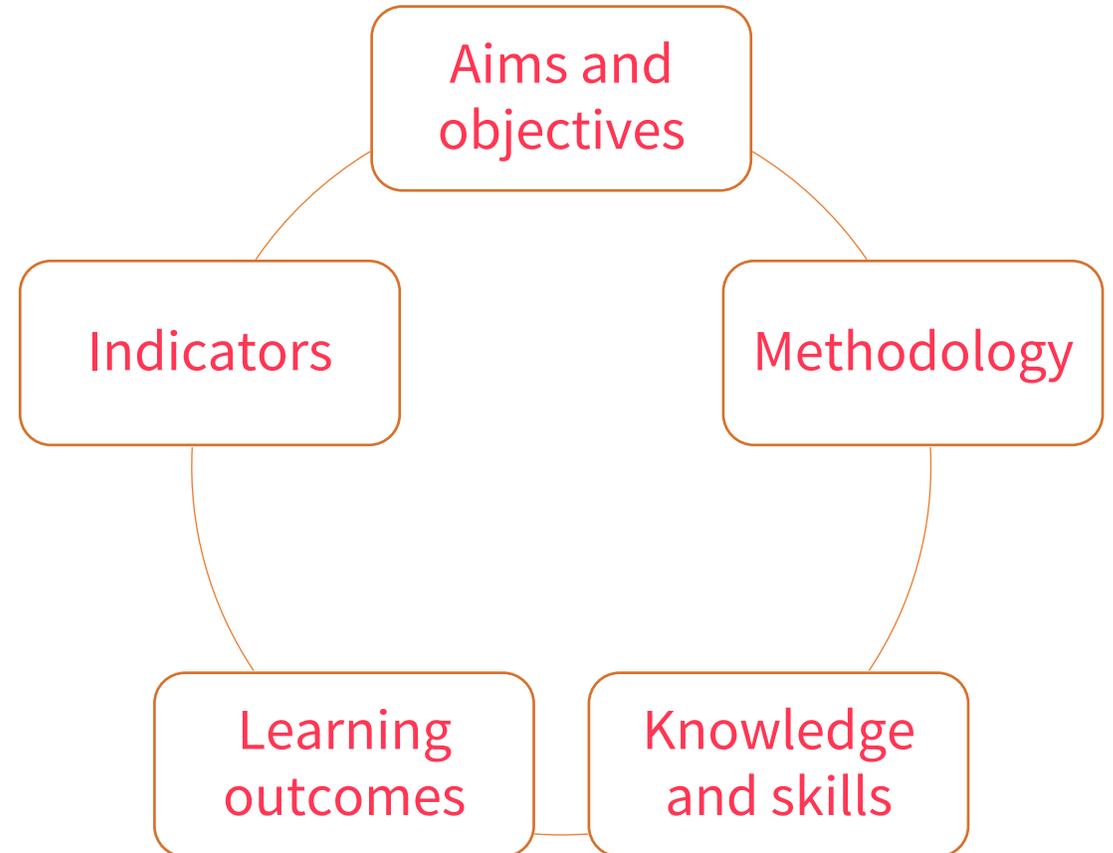
The image shows the cover of a document titled 'D7.1: Didactic framework'. At the top right is the ROSiE logo, which consists of two overlapping speech bubbles, one red and one white, with the text 'ROSiE' below them. The title 'D7.1: Didactic framework' is in a large, bold, red font. Below the title, the authors are listed: 'Authors: Signe Mežinska, Jekaterina Kalēja, Ilze Mileiko, Ivars Neiders'. At the bottom, there is a red vertical bar followed by the text 'RESPONSIBLE OPEN SCIENCE IN EUROPE' and 'ROSiE'.

ROSiE

D7.1: Didactic framework

Authors: Signe Mežinska, Jekaterina Kalēja, Ilze Mileiko, Ivars Neiders

RESPONSIBLE OPEN SCIENCE IN EUROPE
ROSiE



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
- openness 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 decisions 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



Case studies

Social sciences

Material for trainers + handouts, printouts and readings for trainees

Humanities

Material for trainers + handouts, printouts and readings for trainees

Health and life sciences

Material for trainers + handouts, printouts and readings for trainees

Natural sciences

Material for trainers + handouts, printouts and readings for trainees

Citizen scientists

Material for trainers + handouts, printouts and readings for trainees

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

Training and Capacity-Building Resource

> Home > Research integrity > Research ethics > Overlapping issues > Developing Infrastructures > Responsible Open Science

Responsible Open Science

> Citizen Scientists

Ethical and societal foundations of open science

Protection of research participants

Rights of citizen scientists

Quality of research outputs and data sets

Conflicts of interest in citizen science

Risks to environment, animals, plants, and ecosystems

> Health and Life Sciences

> Humanities

> Natural Sciences

> Social Sciences

Home > Responsible Open Science > Citizen Scientists > Protection of research participants

Protection of research participants

Learning objectives and introduction Key issues Test Case studies Resources



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

Introduction.....	3
Unit 1. Ethical and societal foundations of OS, its purpose	5
Activity 1. Principles, values, benefits and risks of OS.....	5
Unit 2. Protection of research participants, animals, plants and ecosystems in OS.....	8
Activity 2. Privacy of research participants in the context of OS.....	8
Activity 2.1. Protection of animals, plants, and ecosystems in OS.....	10
Unit 3. Ethical aspects of citizen science in the context of OS	12
Activity 3. Development of an ethically sound citizen science project.....	12
Unit 4. Protection of intellectual property in the context of OS	14
Activity 4. Authorship and contributorship in citizen science	14
Activity 4.1. Inequities and potential of exploitation in OS.....	16
Unit 5. The quality of the research outputs and data sets	18
Activity 5. Responsibility for the quality of research data.....	18

Example activity: Concerns to share and reuse data

IR^uSiE

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	
"Lock 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

IR^uSiE

Training Materials for Responsible Open Science

"Concerns about 'weaponization'. In some highly politicized domains of science (such as climate science), politically motivated actors may use shared data in an attempt to discredit published work that contradicts their agenda."	
Add additional concerns	

^ v 2 of 4 + ↻ 🔍



Thank you!

Thanks to the co-authors: Ivars Neiders, Ilze Mileiko, Jekaterina Kalēja, Zanda Rubene

Thanks to all reviewers of the didactic framework and training materials:

Rosemarie Bernabe, Sandra Bendiscioli, Stephanos Cherouvis, Ilaria Anna Colussi, Keziah Chanyisa Khayadi Dash, Su Nee Goh, Eva Hnátková, Margarita Poškutė, Vivian Mbanya, Lilian Kwamboka Mocheche, Mari-Liisa Parder, Vana Stavridi, Luiza Bengtsson, Katarzyna Biernacka, Mónica Cano Abadia, Kate Chatfield, Chien Chou, Ilaria Colussi, Iryna Degtyarova, Jaana Eigi-Watkin, Claudia Fabo, Olivier Le Gall, Eugenijus Gefenas, Panagiotis Kavouras, Tom Lindemann, Michael Mende, Claire Murray, Egle Ozolinicute, Julia Prieß-Buchheit, Rita Santos, Armin Schmolmüller, Kadri Simm, Loreta Tauginiene, Mariana Vidal Merino

Thank you!

R²SiE

