



---

# Open Science training



@helenebrinken

Helene Brinken  
University of Göttingen  
brinken@sub.uni-goettingen.de

# What is Open Science?



Open Science is the practice of science in such a way that others can **collaborate** and **contribute**, where research data, lab notes and other **research processes** are **freely available**, under terms that enable **reuse, redistribution** and **reproduction** of the research and its underlying data and methods.

[FOSTER, Open Science Definition: <https://www.fosteropenscience.eu/foster-taxonomy/open-science-definition>]

The movement to make scientific **research, data and dissemination accessible to all levels** of an inquiring society.

[FOSTER, Open Science Definition <https://www.fosteropenscience.eu/taxonomy/term/7>]

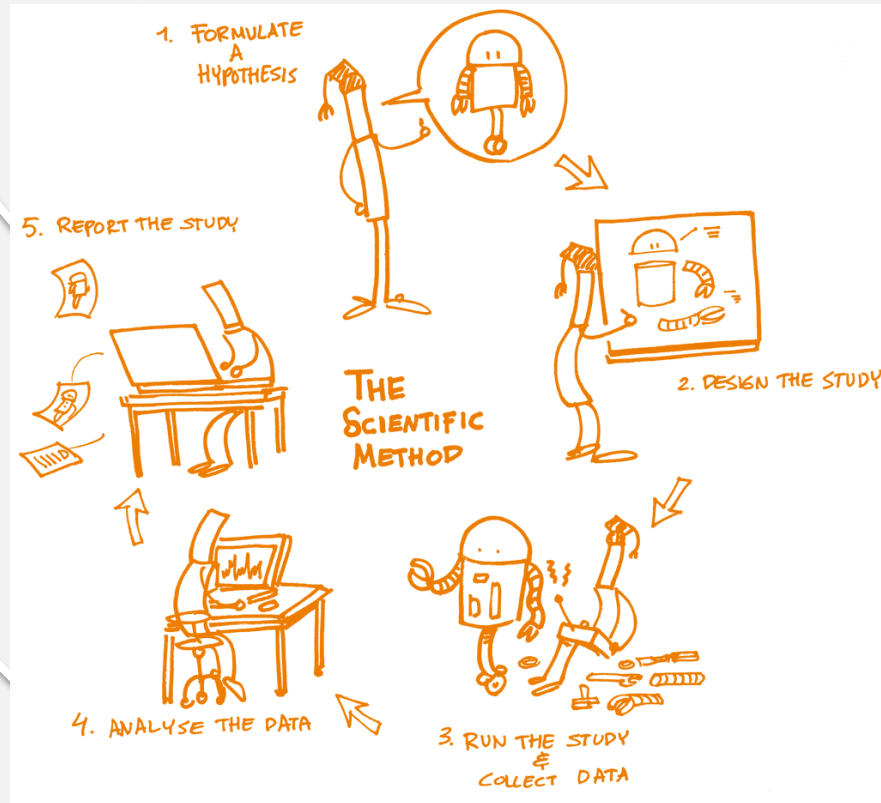
# Open Science along the research lifecycle

Journal article,  
dissertation,  
book, source  
code, etc.

Experiments,  
interviews,  
observations, etc.

Qualitative,  
quantitative,  
statistics,  
processes,  
documentation  
etc.

Numbers,  
code, text,  
images, sound  
records, etc.



cycle

**Open Access, Dissemination & Outreach**

Publish research outputs freely accessible, publish preprints & encourage feedback and Open Peer Review (social media, public debate), e.g. OA journals, OA repositories (also sharing posters & presentations), translate research in world languages

**Open Proposals**

Share proposals/ hypothesis & involve public, e.g. wikis, blogs, social media, academic social networks

**Open Science Tools**

E.g. notebooks, preregister research proposal, document & share experimental process of trial & error using workflow management systems

Idea

**Open Reproducible Research**

Document research routines freely accessible, cite Open Access versions of literature & provide data and code citations, acknowledge contributor roles in a publication & make conflicts of interest transparent

Publish

Methodology

**Maximize use, re-use, collaboration & impact**

**Open Data**

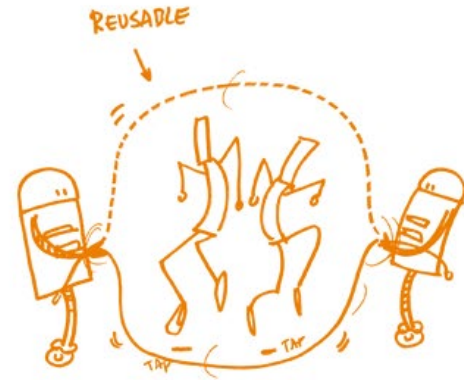
Search for existing data before generating your own, manage & share research data in the most open format by using versioning control, storage management & meta data; use easily attainable software to allow anyone to reproduce your results

Analysis

Data Collection



#### 4 FUNDAMENTAL RULES OF OPEN SCIENCE



Open Science Training Handbook. <https://book.fosteropenscience.eu/>

## Basic tools

- Digital Object Identifiers (DOIs)
- Rich meta data
- Long-term archiving e-infrastructure

# Why Open Science?

“Mostly due to current methods capture and data malpractice, approximately **50% of all research data** and experiments is considered **not reproducible**, and the vast majority (likely over 80%) of data never makes it to a trusted and sustainable repository.”

*Source: Realising the European Open Science Cloud, EC DG Research & Innovation 2016*

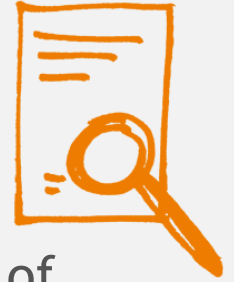
[http://ec.europa.eu/research/openscience/pdf/realising\\_the\\_european\\_open\\_science\\_cloud\\_2016.pdf#view=fit&pagemode=none](http://ec.europa.eu/research/openscience/pdf/realising_the_european_open_science_cloud_2016.pdf#view=fit&pagemode=none)

# Benefits of Open Science



- Increasing **efficiency** of research
  - i.e. avoiding duplication of effort & reducing data collection costs
- Promoting scholarly rigor & **quality** of research
  - i.e. providing data available for peer review
- Enhancing **visibility** & scope for engagement
  - across research community
  - new possibilities for citizen science & public engagement
- Enabling researchers to ask & address **new** research **questions**
  - i.e. aggregate and re-analyse data from wide range of sources

# Benefits of Open Science



- Inducing **collaboration** & **community-building** for the sharing of knowledge and expertise

- across institutional, national and disciplinary boundaries

[Source: Open To All? Case studies of openness in Research [http://www.rin.ac.uk/system/files/attachments/NESTA-RIN\\_Open\\_Science\\_V01\\_0.pdf](http://www.rin.ac.uk/system/files/attachments/NESTA-RIN_Open_Science_V01_0.pdf)]

- Fostering **inclusivity, participation & application of research**

- opportunities for society

- Increasing the **economic & social impact** of research

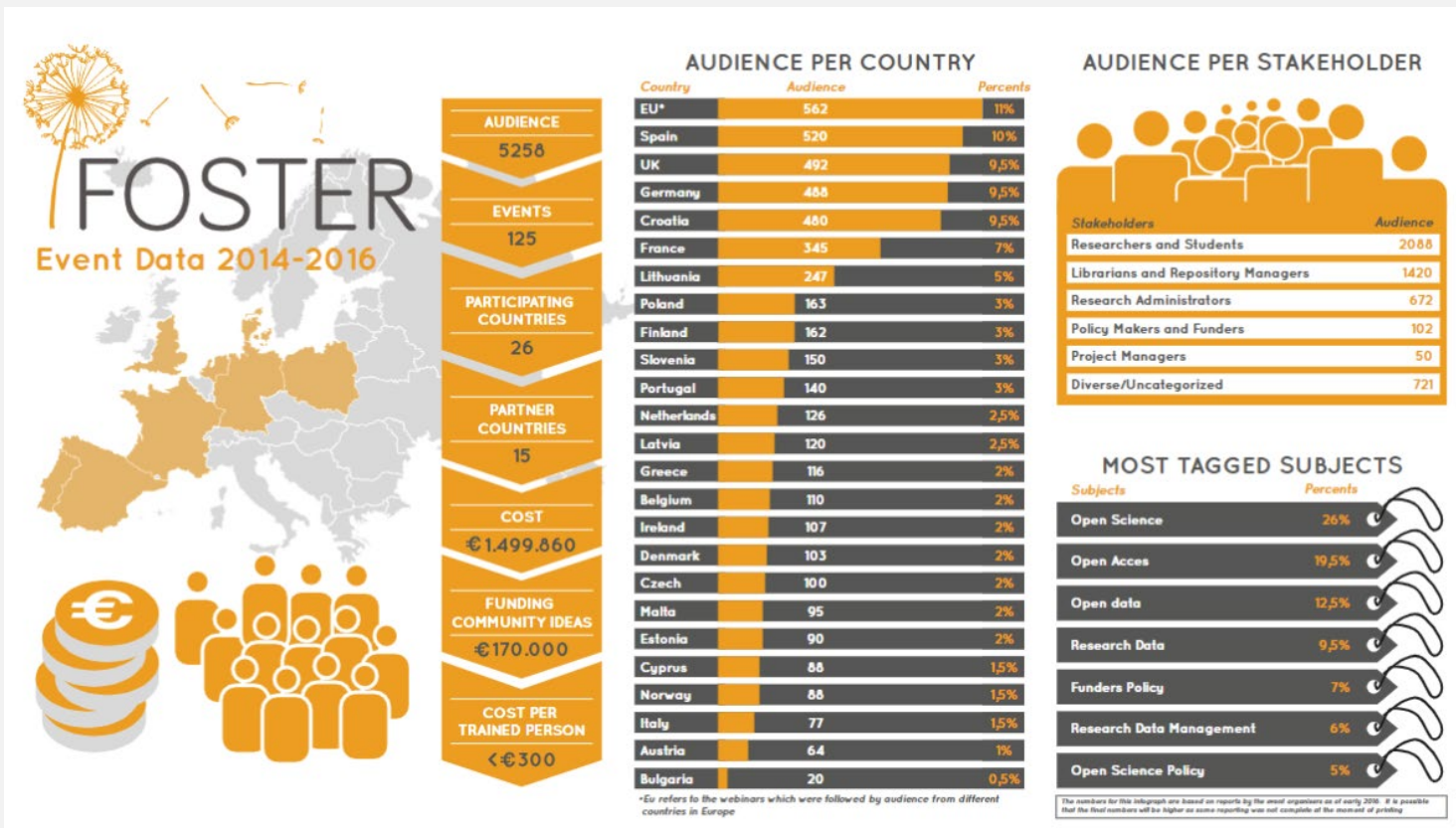
- Complying to funders' **requirements**

- e.g. European Commission (OA policy & open research data pilot)

[Report URL: [https://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/oa\\_pilot/h2020-hi-oa-pilot-guide\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf)]



# FOSTER - The Project

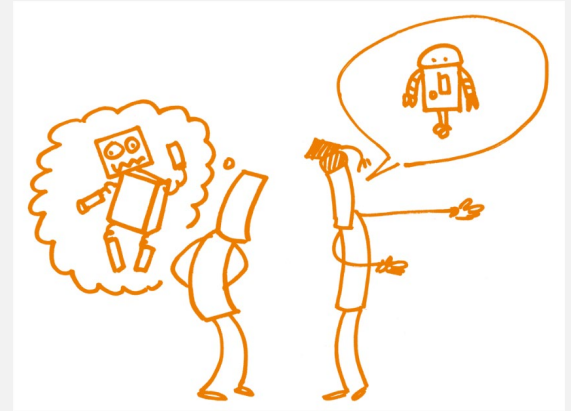


# FOSTER Plus - The Project

EU-funded (2017-19)

– Objectives:

- Achieve cultural change towards Open Science
- Raise awareness
- Foster the practical implementation of Open Science



# Open Science Training



offline & online



[www.fosteropenscience.eu](http://www.fosteropenscience.eu)



USE FOSTER TO:



**Access Free Courses**

Our **free courses** have been authored by experts and experienced educators.



**Earn Badges**

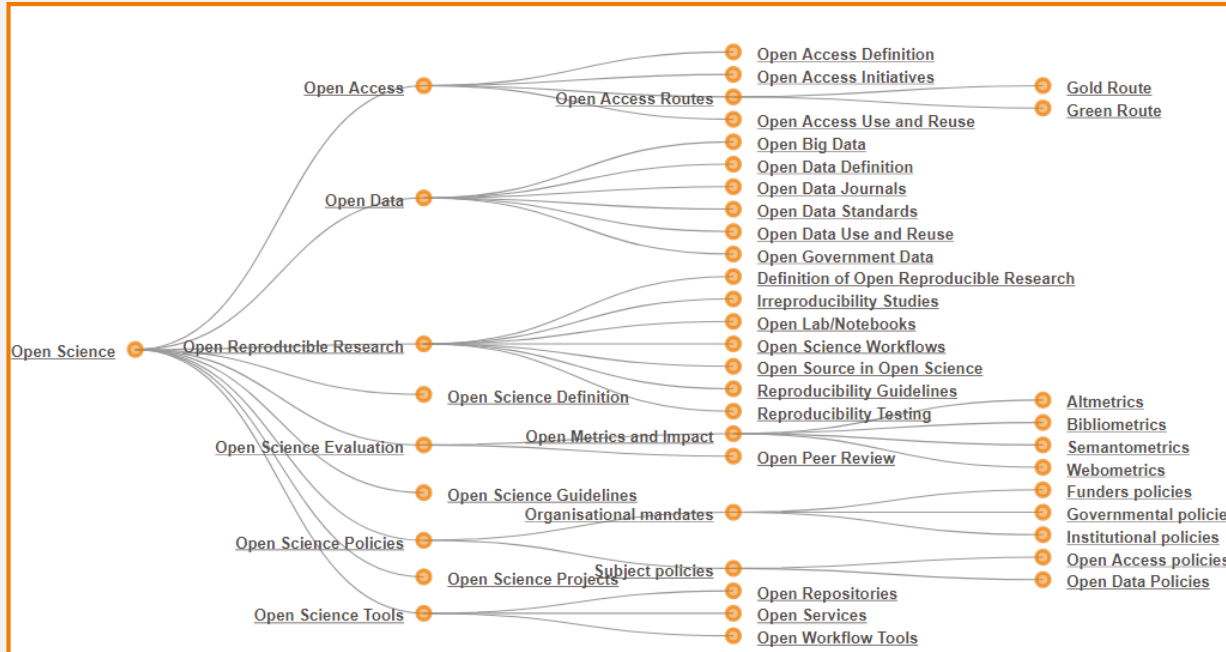
Get recognised for taking **our courses** and follow our **learning paths** to specialisation.



**Participate in the community**

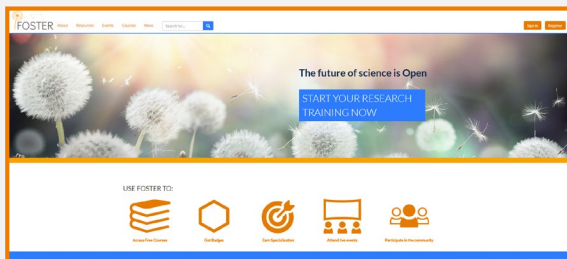
Attend our **live events**, become a trainer and be part of our network.

# Materials to Re-use



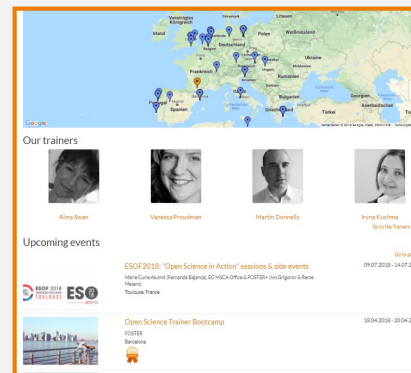
Paper available at <http://oro.open.ac.uk/44719/>. Image available at <http://oro.open.ac.uk/47806/>

# FOSTER Plus resources



[www.fosteropenscience.eu](http://www.fosteropenscience.eu)

Events calendar  
& trainers directory



What does OPR mean?

Definition of OPR

Click the forward arrow to see more.



CC BY-DLG images

New courses

Why is OPR important?

6 good reasons

OPR helps support the transition to Open Science by making all aspects of the research lifecycle more transparent. OPR offers a number of additional benefits.

Click the headings to explore further.

- + Transparency
- + Speed
- + Reliability
- + Consistency
- + Context
- + Motivation

Introduction

Open Peer Review Module

This module introduces you to open peer review (OPR), an emerging practice which is gaining momentum as part of Open Science.

Upon completing this module, you will:

1. Understand what OPR means and how it supports Open Science;
2. Understand OPR workflows and which aspects of the review process can be conducted openly;
3. Know how to write a constructive and responsible peer review; and
4. Be introduced to useful tools and services that support you putting OPR into practice.

[www.fosteropenscience.eu/toolkit](http://www.fosteropenscience.eu/toolkit)

# Access Free Courses

<b>What is Open Science?</b>	<b>Best Practice in Open Research</b>	<b>Open Access Publishing</b>	<b>Open Peer Review</b>	<b>Sharing Preprints</b>
				
<b>Data Protection &amp; Ethics</b>	<b>Open Source Software &amp; Workflows</b>	<b>Managing &amp; Sharing Research Data</b>	<b>Open Science &amp; Innovation</b>	<b>Open Licensing</b>
				

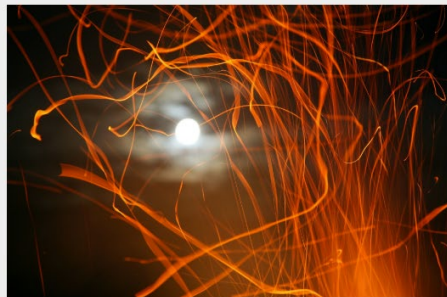
[www.fosteropenscience.eu/toolkit](http://www.fosteropenscience.eu/toolkit)



## What is Open Science?

Spanish version available

This introductory course will help you to understand what open science is and why it is something you should care about.



## Best Practices

Spanish version available

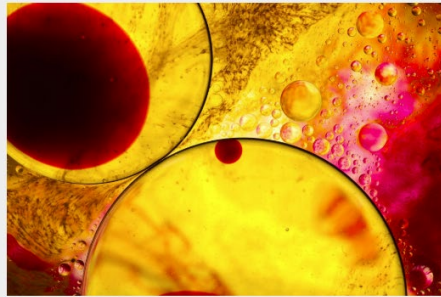
This course introduces some practical steps for opening up your research practices and how to meet expectations relating to openness from funders, publishers and peers.



## Managing and Sharing Research Data

Spanish version available

In this course, you'll focus on which data you can share and how you can go about doing this most effectively.



## OSS and Workflows

Spanish version available

This course introduces Open Source Software (OSS) and workflows as an emerging but critical component of Open Science.



## Data Protection and Ethics

Spanish version available

This course helps you to get to grips with responsible data sharing.



## Open Licensing

Spanish version available

This course helps you to find the best open license for your open research outputs.



## Open Access Publishing

Spanish version available

This course will help you become skilled in making your publications openly accessible in line with funders' requirements and in the wider context of Open Science.



## Sharing Preprints

Spanish version available

This course introduces the practice of sharing preprints and helps you to see how it can support your research.



[www.fosteropenscience.eu/toolkit](http://www.fosteropenscience.eu/toolkit)

# Open Science Courses

Answering burning questions of researchers



Where relevant, discipline specific examples  
(CRG, GESIS, DARIAH-EU)

Interactive content  
(quizzes & badges after each course)





# Earn Badges for courses & learning paths

- 5 learning paths
- Effort 3-5 hours
- Complete a set of courses & get a badge



FOLLOW OUR LEARNING PATHS:



The open peer reviewer



The responsible data sharer



The reproducible research practitioner



The open innovator



The open access author

# Learning paths

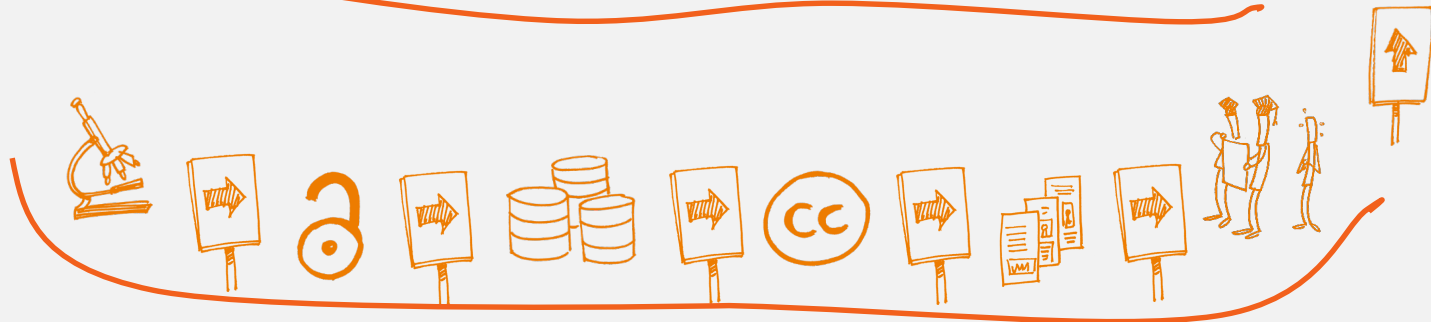
The  
Reproducible  
Research  
Practitioner



The Open  
Peer  
Reviewer



The Open  
Access  
Author





## The open peer reviewer

The practice of peer review is evolving to become more open. This pathway will help you to understand the process and be able to participate - both as an author and as a reviewer.

Effort: 2-3 hours

Level: Intermediate and advanced

The learning path will be completed by finishing the following courses:

- Open peer review
- Managing and sharing research data
- Open source software and workflows



Open Peer Review ✓



Managing and Sharing Research Data - 0%



Open Source Software and Workflows - 0%



# Introduction

## OPR in three minutes

is part of Open

### What does Open Peer Review (OPR) mean?

#### Definition of OPR

#### Why is OPR important?

#### Six good reasons

#### Are you ready for Open Peer Review?

#### Transparency can be added to peer review through:

Tick all that apply.

Accessible evaluation reports

Platforms that allow interaction

Revealed identities of reviewers

Submit

Show feedback

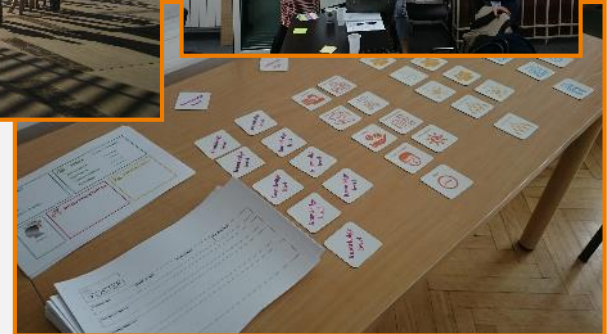
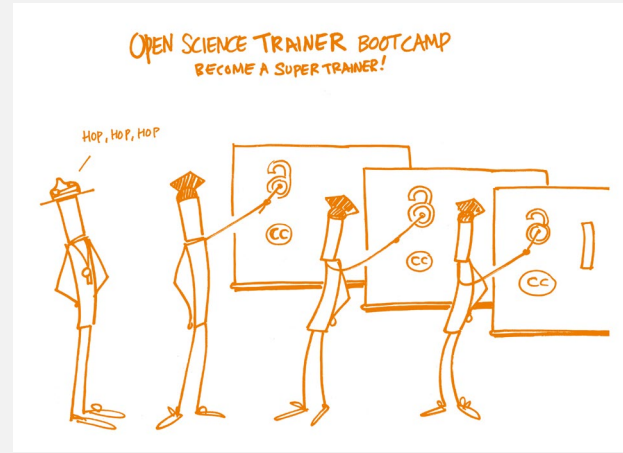
S,

# Training the trainers

- Multiplier effect
- Building a community of trainers

## → Trainer bootcamps

- Barcelona
- Lisbon
- Salamanca
- The Hague
- Belgrade
- Debrecen
- Kaunas
- Riga
- Rio de Janeiro



# FOSTER training 2017-2019

- 95 trainings with more than 2500 participants in 22 countries
- 45 webinars with more than 1700 participants



# Resources to support trainers community

- Events calendar
- Trainers directory
- Infrastructure to share materials
- Resources
  - Open Science Training Handbook
    - Guide for trainers on **how to** forward knowledge on Open Science
    - Resource from the community for the community



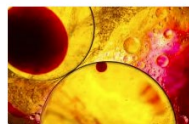
Open Science Train-the-Trainer Bootcamp at University of Belgrade, Serbia

FOSTER  
Belgrade, Serbia



Open Science and Research Data Management Train-the-Trainer Bootcamp in The Hague, Netherlands

FOSTER  
Den Haag



Introduction to Data Management Planning webinar

FOSTER, iPlacenta  
Virtual

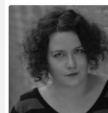


Eloy Rodrigues

Languages: Portuguese (PT), English (EN), Spanish (ES)

Topics of Interest: Open Science | Open Access | Open Data | Open Metrics and Impact | Intellectual Property Rights

Audience: Librarians and Repository managers | PHD Students | Policy makers and Funders | Project Managers | Researchers and Students



Gwen Franck

Languages: English (EN), French (FR), Dutch (NL)

Topics of Interest: Open Science | Open Access | Open Data | Open Metrics and Impact | Intellectual Property Rights | Institutional policies | Open Access policies | Gold Route | Green Route | Open Science Policies

Audience: Policy makers and Funders | Librarians and Repository managers | Researchers and Students



Iryna Kuchma

Languages: English (EN)

Topics of Interest: Open Metrics and Impact | Research Data Management | Open Access | Open Data | Open Science Policies

Audience: Policy makers and Funders | Librarians and Repository managers | Researchers and Students | PHD Students

# The Open Science Training Handbook



- Idea: bring experienced trainers together to write a book
- Format: 5-day book sprint
  - FOSTER: writing environment
  - Authors: expertise & skills



14 experts invited as authors

- CC Zero licence for simple re-use
- Living book open for contributions & translations

# Open Science Basics



Open Concepts & Principles



Open Research Data & Materials



Open Access to Published Research Results



Open Science Policies



Open Licensing & File Formats



Open Research Software & Open Source



Open Education Resources



Open Peer Review, Metrics & Evaluation



Reproducible Research & Data Analysis

[book.fosteropenscience.eu](http://book.fosteropenscience.eu)



# Open Science Basics



What is it?



Why is it important?



Further resources



Learning objectives  
to achieve



Key components:  
Knowledge & skills



Questions,  
obstacles, &  
common  
misconceptions

[book.fosteropenscience.eu](http://book.fosteropenscience.eu)

[Readme](#)

[Introduction](#)

Open Science Basics

Open Concepts and Principles

Open Research Data and Materials

Open Research Software and Op...

Reproducible Research and Data ...

Open Access to Published Resea...

Open Licensing and File Formats

Collaborative Platforms

Open Peer Review, Metrics and E...

Open Science Policies

Citizen Science

Open Educational Resources

Open Advocacy

On Learning and Training



[book.fosteropenscience.eu](https://book.fosteropenscience.eu)

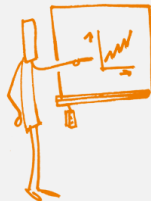


## The Open Science Training Handbook

A group of fourteen authors came together in February 2018 at the TIB (German National Library of Science and Technology) in Hannover to create an open, living handbook on Open Science training. High-quality trainings are fundamental when aiming at a cultural change towards the implementation of Open Science principles. Teaching resources provide great support for Open Science instructors and trainers. The Open Science training handbook will be a key resource and a first step towards developing Open Access and Open Science curricula and andragogies. Supporting and connecting an emerging Open Science community that wishes to pass on their knowledge as multipliers, the handbook will enrich training activities and unlock the community's full potential.

<https://www.fosteropenscience.eu/node/2437>

## On Learning and Training



How to

- **Prepare** your workshop
  - Theoretical learning strategies
  - Different audiences
  - Strategies to develop motivation
- **Execute** your workshop
  - How to design a course
  - How to choose content
  - How to start training
- **& reflect** on your workshop
  - Aspects to evaluate

## Organisational Aspects



- Venue
  - Timing & budget
  - Equipment & media
  - Marketing & advertising strategy
  - Registration
  - Evaluation
- Check list



# Example training outlines



- 24 exercises:
  - Format, time needed, topic, learning objectives, description, materials needed, level of prior knowledge, how to adapt
- Open Science Café
  - Enable low-threshold discussion and dialogue between different stakeholders

**Open Science Cafe**

Brought to you by:



Scientific publishing will always be dominated by commercial publishing houses.

Open data should be a responsibility of the institution, not of the individual researcher.

When assessing quality of research, 'openness' should be as big a factor as journal prestige.

Data sharing is more important than Open Access to publications.



CC BY Martine Oudenhoven

[www.fosteropenscience.eu/content/organise-your-own-open-science-cafe](http://www.fosteropenscience.eu/content/organise-your-own-open-science-cafe)



Thank you! Questions?

Facebook: @fosteropenscience

Twitter: @fosterscience

Youtube: [FOSTER Open Science](#)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 741839