

A hand is shown holding a glowing blue wireframe globe. The globe is composed of many small, interconnected triangles, creating a mesh-like structure. The hand is positioned over a laptop screen, which is partially visible in the background. The overall scene is set against a dark, blurred background, suggesting a professional or technological environment.

OPEN DATA & OPEN KNOWLEDGE Workshop

**UNIVERSITY
OF TWENTE.**



NEW GENERATION AND OPEN SCIENCE: TOP-DOWN OR BOTTOM-UP

Masoom Shariat, Research Support Officer
University of Twente / Faculty of Geo-
information and Earth Observation (ITC)

Open Science requires a culture change

■ Requirements to realize Open Science

Make OS...

Possible through Open Infrastructures

Easy through Support & Training

Normative through Community Engagement

Rewarding through incentives

Compulsory through Policies & Regulations



ITC's motivations for doing OS

intrinsic

ITC strategic goals

Reducing the knowledge divide among countries and tackling global challenges

Shaping2030

UTwente's mission, vision, and strategy to increase the societal impact of research as well as diversity and inclusion in science

extrinsic

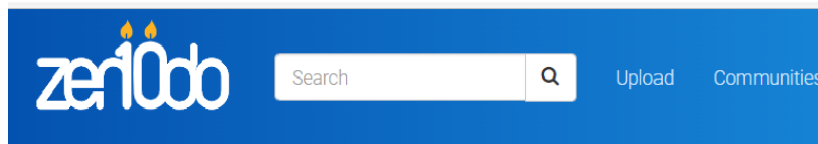
OS is on the rise and driven by several high-level organisations, funding programs and projects



ITC's steps toward Open Science

■ ITC's Strategic Plan for Open Science

<https://zenodo.org/record/5113578>



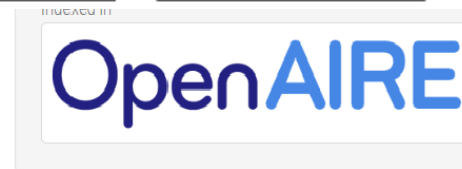
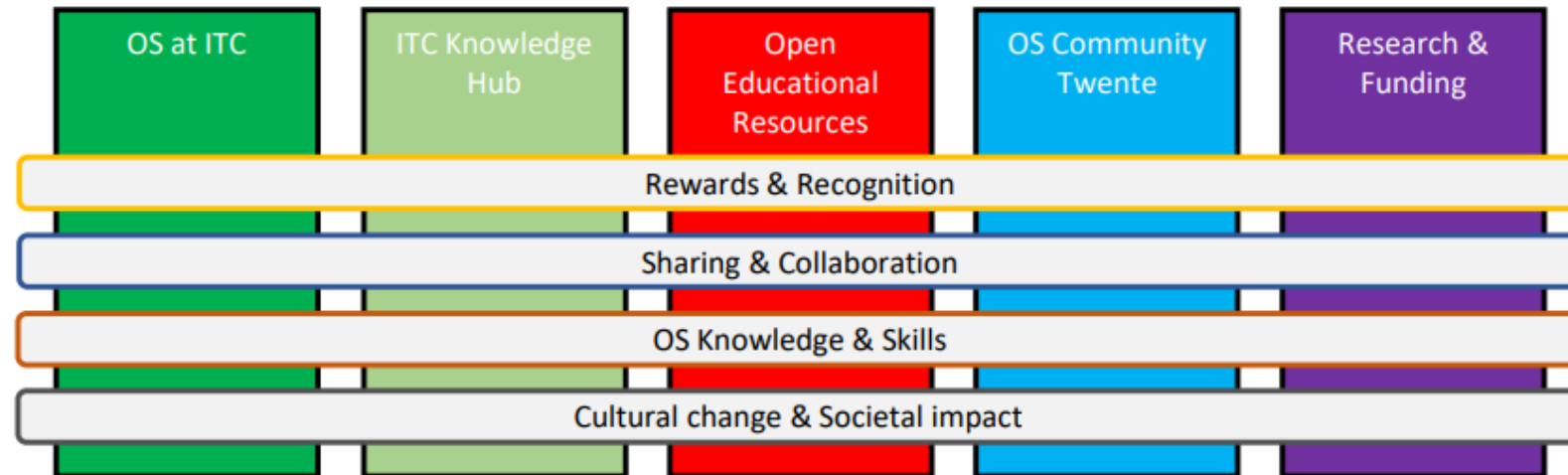
July 19, 2021

ITC's Strategic Plan for Open Science 2025 - Towards an Open Future

Konkol, Markus; Chang, Ling; Da Silva Mano, Andre; Deon, Fiorenza; Koelen, Marga T.; Kor Ralph; Nelson, Andy; Ostermann, Frank O.; Rietbroek, Roelof; Werff, Harald van der; Milla, Raúl

Open Science (OS) is an umbrella term comprising principles to increase the transparency of research. Access to scientific articles, these principles contain public availability of reusable methods (e.g., code and tools), data, and educational materials. This document outlines a plan to achieve the transition towards OS. *ITC's Strategic Plan for OS 2021-2025 - Towards an Open Future* contains five initiatives:

1. **OS at ITC** aims to provide guidelines and OS capacity development to address the obstacles ITC researchers encounter when doing OS.
2. **The ITC Knowledge Hub** will provide services and tools to access, create, and publish open research, including scientific results based on qualitative/quantitative analyses using computational workflows.
3. **Open Educational Resources** will be addressed by exploring options to realise Open Educational Resources at ITC and providing lecturers with guidelines and support to create them.
4. **The OS Community Twente** serves as an inter-disciplinary, bottom-up community to promote, learn, share, and discuss OS practices.
5. **Research & Funding** aims to address challenges in OS through innovative developments and user studies. A further output is to generate funding to realise the ambitious aims presented in the plan.



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ITC's steps toward Open Science

Open Science Community Twente



Open Science (OS) is on the rise and will change the research landscape in the next years. Many initiatives have the goal to make the entire research process more transparent and re-usable to increase the benefit of research for society. The University of Twente (UT) took note of these developments. Consequently, OS plays a key role in *Shaping2030*, UT's mission, vision, and strategy for 2020-2030. But don't worry, you'll never walk alone. The *Open Science Community Twente* is ready to help to make our research more reproducible and accessible at all stages of the research cycle, from planning to

The figure comes from [OSCT](#)

Open Geospatial Data Publication (Flagship datasets)



Code Review Service



Open Geospatial Data Publication @ ITC

Challenges

- Data dumping is not data publishing!
- Not enough supplementary material for reusing geospatial data
- Limited amount of metadata

Solution

- Encapsulating the data in an interactive environment
 - Publish a *Jupyter Notebook* that contains *data exploration*
 - Use *open-source online tools* for sharing *Jupyter Notebook* (e.g., *Binder*)
 - Explore the data via the browser *without installing any tools*

The image shows a Binder environment. At the top, a file browser lists various geospatial data files such as 'travel_time_to_cities_1.tif' and 'travel_time_to_ports_1.tif'. Below this is a dataset page titled 'Travel time to cities and ports in the year 2015' with options to 'Cite', 'Download all (6.65 GB)', 'Share', 'Embed', and '+ Collect'. A red box highlights a link: 'If you want to use this dataset in an interactive environment, then use this link https://mybinder.org/v2/gh/GeographerATLarge/TravelTimeHEAD'. Below the dataset page is a Jupyter Notebook with the following content:

```
6.1 show the new travel time map
```

```
[28]: plt.figure(1)
      plt.imshow(new_travel_time_map)
      plt.title('Travel_time_to_cities_' + Min_Population + '_' + Max_Population)

[29]: Text(0.5, 1.0, 'Travel_time_to_cities_5000_20000')
```

7. Create a subset of map

Each travel map is a 30 arc-second resolution raster in WGS84 (coordinate reference system EPSG:4326) projection with a bounding box of 85°N, 180°E, 60°S and 180°W. In this section you can choose a map and clip it using a bounding box.

```
[29]: Image_MAX_SIZE_PIXELS = None
      # change the name of travel time map to what you desire (select from the new_maps_dict that are retrieved or the new travel time map that is created in section 6)
      file_name = gdal.OpenEx('data/travel_time_to_cities_7.tif')
      # change the following coordinates to any bounding box you want (select inside the bounding box of 85°N, 180°E, 60°S and 180°W)
      upper_left_x = 0
      upper_left_y = 60
      lower_right_x = 25
      lower_right_y = 35
      window = (upper_left_x, upper_left_y, lower_right_x, lower_right_y)
      # the cropped map is saved next to the input maps (folder 'data'), you can change the path for saving the cropped map in any location you would like.
      gdal.Translate('data/output_crop_map.tif', file_name, projWin = window)

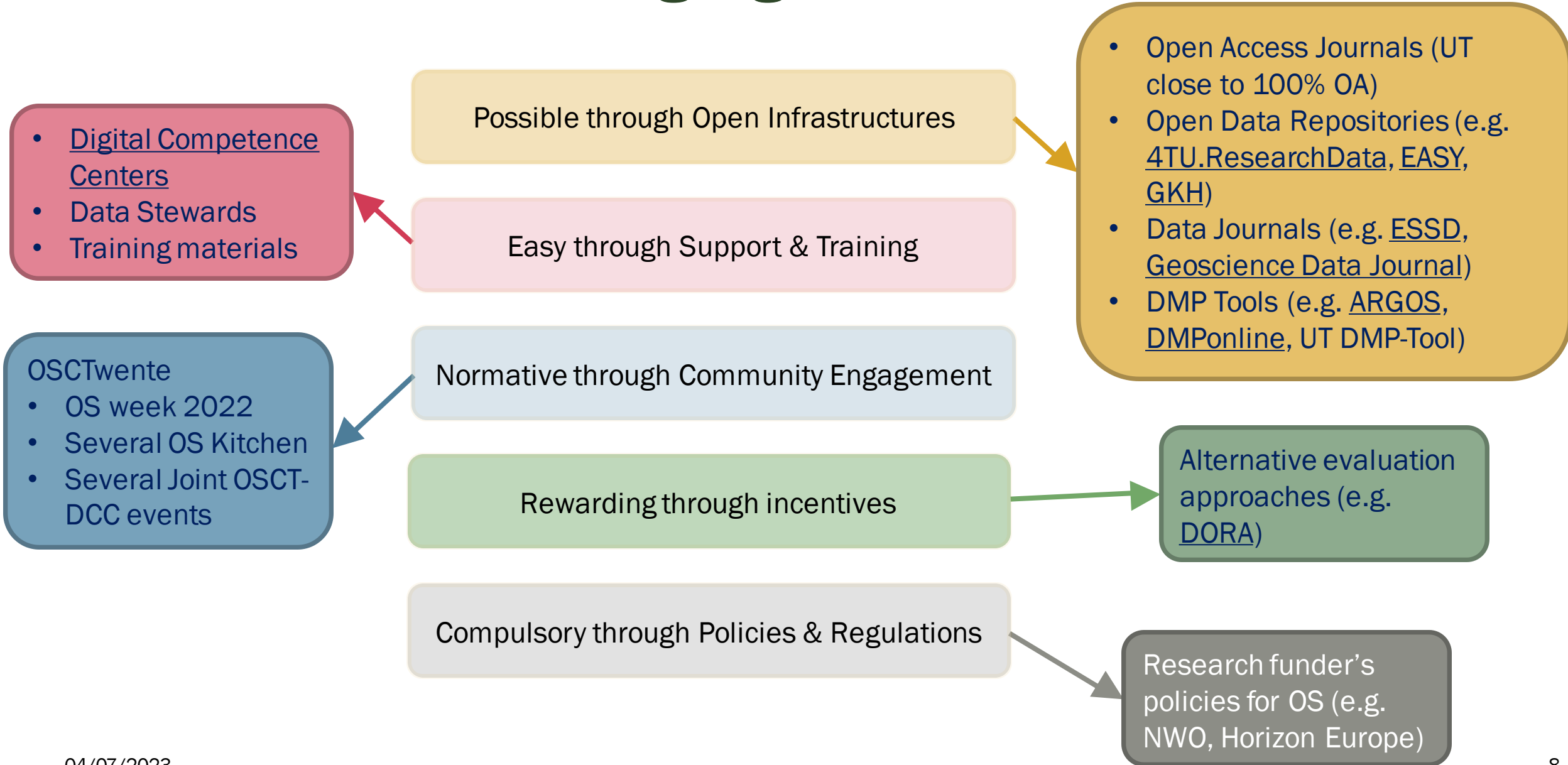
[30]: %osgeo.gdal.Dataset; proxy of <Sgdg Object of type 'GDALDatasetShadow' at 0x000001284F0E9480 >
```

```
7.1 show the output crop travel time map
```

```
[30]: plt.figure(1)
      plt.imshow(Image.open(os.path.join('data', 'output_crop_map.tif')))
      plt.title('output_crop_map.tif')

[31]: Text(0.5, 1.0, 'output_crop_map.tif')
```

The culture is changing!

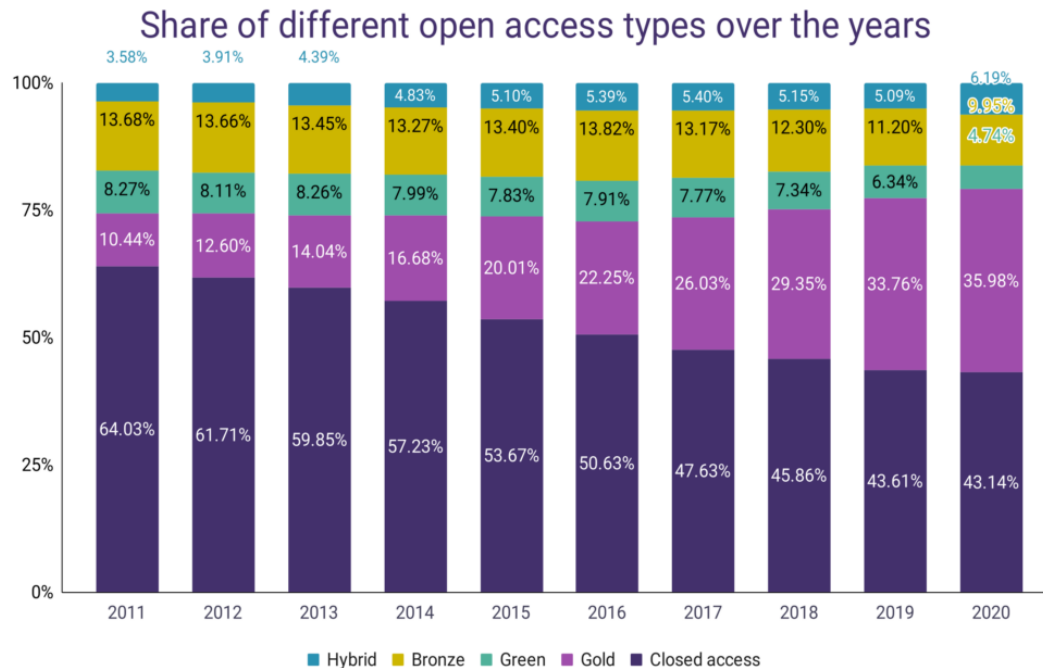


Culture Change requires time

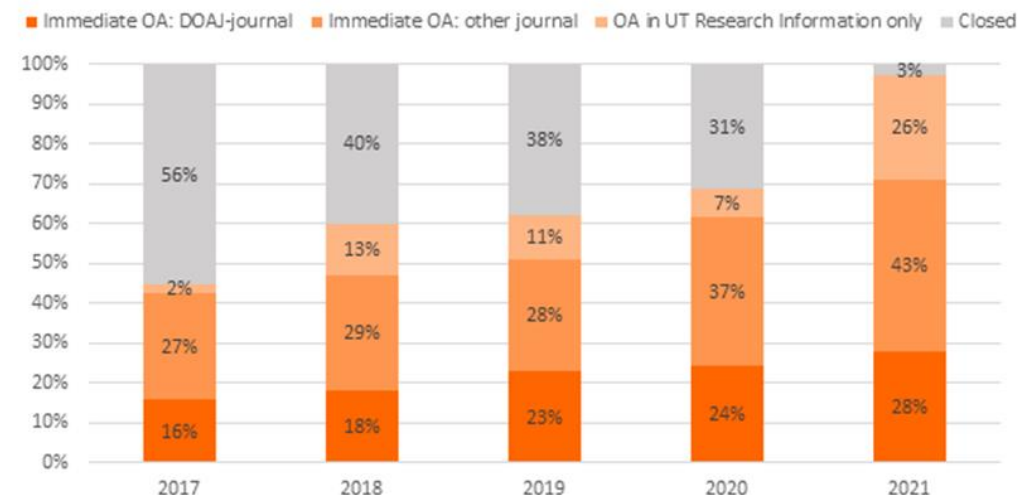
- When Open Access publications started it was not common, now become norm in a short period
- We expect the same happens for Open Data

“Goud, DOAJ OA”	“Hybride en niet DOAJ OA”	“Alleen groen OA”	Totaal OA
13%	20%	9%	42% (2016)
17%	23%	10%	50% (2017)
19%	24%	11%	54% (2018)
21%	29%	12%	62% (2019)
25%	35%	13%	73% (2020)
28%	39%	15%	82% (2021)

The figure comes from: [Dutch Open Access Monitor\(202\)](#)



UT-authored, peer-reviewed journal articles 2017 – 2021



Guide

May 10, 2023

Open Science: A Practical Guide for Early-Career Researchers

Loek Brinkman; Elly Dijk; Hans de Jonge; Nicole Loorbach; Daan Rutten

Other(s)

Marjan Grootveld; Vera Heininga; Melanie Imming; Bianca Kramer; Caspar van Lissa; Dan Rudmann; Raúl Zurita-Milla

The Dutch consortium of University Libraries and the National Library of the Netherlands (UKB), together with the Universities of The Netherlands (UvL), the Dutch national centre of expertise and repository for research data (DANS) and the Dutch Research Council (NWO), has published a practical guide on open science.

Open Science
Reliable science is not the sole work of superhuman geniuses, but a collaborative process. Researchers rely and build upon each other's work. Together, we build theories, collect evidence and assess the research of colleagues. However, we can only build upon others' work if we know exactly what our predecessors have done: What were their methods, relevant materials, data and outputs? Therefore, sound science ideally equals Open Science, in which all phases of the research cycle are as transparent and accessible as possible.

About this guide
Beginning researchers are an important link in the transition to Open Science, so this guide is aimed at PhD candidates, Research Master Students, and early-career researchers from all disciplines at Dutch universities and research institutes. It is designed to accompany researchers in every step of their research, from the phase of preparing your research project and discovering relevant resources (chapter 2) to the phase of data collection and analysis (chapter 3), writing and publishing articles, data, and other research output (chapter 4), and outreach and assessment (chapter 5). Every chapter provides you with the best tools and practices to implement immediately.

If the information in this guide feels overwhelming: Do not worry! Open Science is a journey, and you are not alone in this.

8,531 views | 3,356 downloads

Indexed in OpenAIRE

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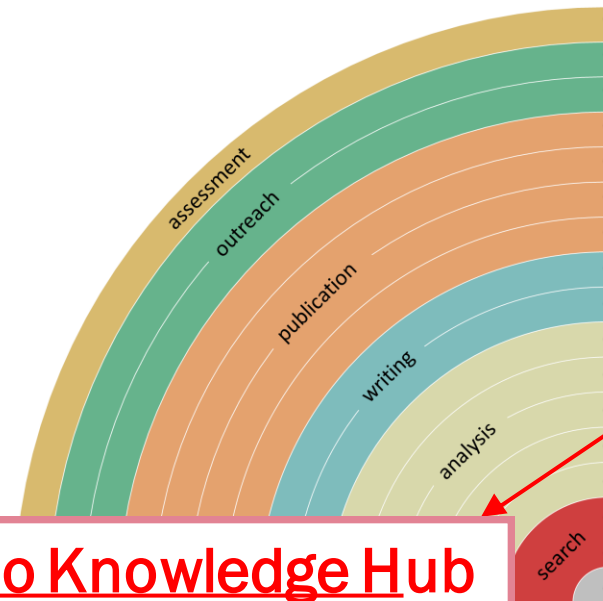
Keyword(s): Open Science, Reproducibility, Citizen Science, Open Access, Research Data Management, FAIR, Open Software, Open Education

Related identifiers: Continues

The future is Open!

The sooner you get used to it in your early carrier, your life will be easier as you learn the skills.

Make all phases of your research as transparent and accessible as possible by



- adding alternative evaluation, e.g. with altmetrics
- communicating through social media, e.g. Twitter
- sharing posters & presentations, e.g. at FigShare
- using open licenses, e.g. CC0 or CC-BY
- publishing open access, 'green' or 'gold'
- using open peer review, e.g. at journals or PubPeer
- sharing preprints, e.g. at OSF, arXiv or bioRxiv
- using actionable formats, e.g. with Jupyter or CoCalc
- open XML-drafting, e.g. at Overleaf or Authorea
- sharing protocols & workfl., e.g. at Protocols.io
- sharing notebooks, e.g. at OpenNotebookScience
- sharing code, e.g. at GitHub with GNU/MIT license
- sharing data, e.g. at Dryad, Zenodo or Dataverse
- pre-registering, e.g. at OSF or AsPredicted
- commenting openly, e.g. with Hypothes.is
- using shared reference libraries, e.g. with Zotero
- sharing (grant) proposals, e.g. at RIO



Open Science: A Practical Guide for Early-Career Researchers | Zenodo

Geo Knowledge Hub

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