Open Science for Early-Career Researchers

- Gareth O’Neill
- Open Science @ UNICAM
- University of Camerino
- 28 September 2018
This talk

- Eurodoc=early-career researchers
- What is and why do Open Science?
- Open Access by 2020 with Plan S
- FAIR and Big Data for researchers
- Open Science skills for researchers

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Eurodoc=early-career researchers

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Eurodoc=early-career researchers

- Legal registered non-profit organisation
- Founded in 2002 and based in Brussels
- Federation of ±30 national associations
- Run for and by early-career researchers
- For 1+ million early-career researchers
- Funded by member fees and volunteers

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Eurodoc=early-career researchers

We develop policy on topics for ECRs:

- Career Development
- Employment Status
- Interdisciplinarity
- Mobility
- Research Integrity
- Doctoral Training
- Equality
- Mental Health
- Open Science
- Research Quality

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What is and why do Open Science?

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What is and why do Open Science?

OI more actors in the innovation process
OS more open research via use of digital technology and tools
OW more cooperation and societal impact

European Commission (2016)

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What is and why do Open Science?

<table>
<thead>
<tr>
<th>OPEN ACCESS</th>
<th>OPEN DATA</th>
<th>OPEN EDUCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Route Publishing</td>
<td>Findable</td>
<td>Accessible</td>
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<tr>
<td>Gold Route Publishing</td>
<td>Interoperable</td>
<td>Reusable</td>
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<table>
<thead>
<tr>
<th>CITIZEN SCIENCE</th>
<th>OPEN SCIENCE</th>
<th>OPEN EVALUATION</th>
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</thead>
<tbody>
<tr>
<td>Citizen Engagement</td>
<td>Open Peer Review</td>
<td>Open Peer Review</td>
</tr>
<tr>
<td>Science Communication</td>
<td>Alternate Metrics</td>
<td>Alternate Metrics</td>
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</tbody>
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<table>
<thead>
<tr>
<th>OPEN SOURCE</th>
<th>OPEN METHODOLOGY</th>
<th>OPEN LICENSING</th>
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<tbody>
<tr>
<td>Open Hardware</td>
<td>Preregistration</td>
<td>Attribution</td>
</tr>
<tr>
<td>Open Software</td>
<td>Open Notebook</td>
<td>Commercial</td>
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What is and why do Open Science?


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What is and why do Open Science?

- opens up research
- increases access
- increases visibility
- increases impact
- pools resources
- fastens innovation
- as open as possible!

sharing is caring

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Open Access by 2020 with Plan S

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91 55 36
Open Access by 2020 with Plan S

O’Neill (2018)

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Open Access by 2020 with Plan S

Standard publishing:
- University libraries buy subscriptions
- Non-members pay to read publications
- Often authors do not retain copyright

Paywall the Movie | Creative Commons

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Open Access by 2020 with Plan S

Open Access routes:
- green = self-archive version in repository
- gold = pay fee (APC) to open immediately
- diamond = no fees to open immediately

Open Access Overview

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Open Access by 2020 with Plan S

- Plan S = cOAlition S
- 12 national funders
- science publications
- all in Open Access
- full and immediate
- by 01 January 2020
- 10 core principles

Plan S

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Open Access by 2020 with Plan S

Support for Plan S:
✓ copyright + books
✓ immediate + full
✓ fees + funding cap
✓ platforms + policies
?? venues with no fees
?? data + source code

Joint Statement on Open Access for Researchers via Plan S

Plan S calls for all scientific publications on the results of research funded by national and European research councils and funding bodies to be published in compliant Open Access journals or on compliant Open Access platforms by 01 January 2020. The plan was initiated by the Open Access Envoy of the European Commission and Science Europe and will be implemented by cOAlition S. The coalition currently includes 11 national funders and is supported by the European Commission and European Research Council. Plan S consists of 10 principles to be enacted by coalition members. We, representatives of early-career and senior researchers in Europe, commend cOAlition S for taking this bold and ambitious step towards Open Access and offer our support as well as comments on implementing Plan S.

Joint Statement (2018)

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FAIR and Big Data for researchers
FAIR and Big Data for researchers

- collect and tag data with metadata
- store and curate data for posterity
- analyse and logically interpret data
- open up data and research outcomes

Open Science Framework

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Data Management:

- data plans (DMPs)
- data collection
- data analysis
- data visualisation
- data archiving
- data stewardship
- FAIR principles

Digital Curation Centre: DCC Template

Data Collection

What data will you collect or create?

Guidance:
Questions to consider:
- What type, format and volume of data?
- Do your chosen formats and software enable sharing and long-term access to the data?
- Are there any existing data that you can reuse?

Guidance:
Provide a description of the data, including any existing data or third-party sources that will be used. In each case, note the content, type and coverage. Outline and justify your choice of format and consider the implications of data format and data volumes in terms of storage, backup and access.

How will the data be collected or created?

Guidance:
Questions to consider:
- What standards or methodologies will you use?
- How will you structure and name folders and files?
- How will you handle versioning?
- What quality assurance processes will you adopt?

Guidance:
Outline how the data will be collected/created and which community standards (if any) will be used. Consider how the data will be organised during the project, mentioning, for example, naming conventions, version control and folder structures. Explain how the consistency and quality of data collection will be controlled and documented. This may include processes such as calibration, repeat samples or measurements, standard data capture or recording, data entry validation, peer review of data or representation with controlled vocabularies.

DMP Online

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FAIR and Big Data for researchers

FAIR Data Principles

FINDABLE

F1 = (Meta)data are assigned a globally unique and persistent identifier
F2 = Data are described with rich metadata
F3 = Metadata clearly and explicitly include the identifier of the data they describe
F4 = (Meta)data are registered or indexed in a searchable resource

Gareth O’Neill [CC-BY]

ACCESSIBLE

A1 = (Meta)data are retrievable by their identifier using a standardised communications protocol
A1.1 = The protocol is open, free, and universally implementable
A1.2 = The protocol allows for an authentication and authorisation procedure, where necessary
A2 = Metadata are accessible, even when the data are no longer available

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FAIR and Big Data for researchers

**FAIR Data Principles**

**R1** = Meta(data) are richly described with a plurality of accurate and relevant attributes

**R1.1** = (Meta)data are released with a clear and accessible data usage licence

**R1.2** = (Meta)data are associated with detailed provenance

**R1.3** = (Meta)data meet domain-relevant community standards

**I1** = (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation

**I2** = (Meta)data use vocabularies that follow FAIR principles

**I3** = (Meta)data include qualified references to other (meta)data

**INTEROPERABLE**

**FAIR Data Principles**

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Open Science skills for researchers

"Well, here we go again. ... Did anyone here not eat his or her homework on the way to school?"

Gareth O'Neill
Unpublished

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Open Science skills for researchers


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### Open Science skills for researchers

<table>
<thead>
<tr>
<th>Communication</th>
<th>Digital</th>
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<tbody>
<tr>
<td>• Academic writing</td>
<td>• Information accessing and retrieval</td>
</tr>
<tr>
<td>• Formal correspondence</td>
<td>• Information presentation and visualisation</td>
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<tr>
<td>• Oral presentation</td>
<td>• Information processing and exchange</td>
</tr>
<tr>
<td>• Science for non-technical audiences</td>
<td>• Programming</td>
</tr>
<tr>
<td>• Science for policy making</td>
<td>• Software usage and development</td>
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<tr>
<td>• Social media and webinar usage</td>
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Open Science skills for researchers

<table>
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<tr>
<th>Career Development</th>
<th>Enterprise</th>
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<tbody>
<tr>
<td>• Career planning and assessment</td>
<td>• Commercialisation</td>
</tr>
<tr>
<td>• CV writing</td>
<td>• Entrepreneurship</td>
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<tr>
<td>• Interview techniques</td>
<td>• Innovation</td>
</tr>
<tr>
<td>• Job application</td>
<td>• Intellectual Property Rights (IPR)</td>
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<tr>
<td>• Job searching</td>
<td>• Knowledge transfer within and across sectors</td>
</tr>
<tr>
<td>• Skills documentation and verification</td>
<td>• Legal and business standardisation</td>
</tr>
<tr>
<td>• Skills gap identification and development</td>
<td>• Patenting</td>
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</tbody>
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### Open Science skills for researchers

| Research (research intensive and non-research intensive) | • Citizen Science  
• Data analysis  
• Disciplinary knowledge and terminology  
• Ethics and integrity  
• Grant application writing  
• Interdisciplinarity  
• Literature use and management  
• Open Access publishing  
• Open Data management  
• Open Education  
• Open Evaluation  
• Open Licensing  
• Open Methodology  
• Open Source  
• Project management  
• Time management |

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Open Science skills for researchers

For Open Science:
- training and support
- Open Access policies
- DMPs for projects
- FAIR Data policies
- Open Science skills
- use online courses!

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Thank you for listening!

- Gareth O’Neill - President of Eurodoc

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