Institutional Framework and Responsibilities: Facing Open Science’s challenges and assuring quality of research

LERU workshop: Nurturing a Culture of Responsible Research in the Era of Open Science
Campus Biotech, Geneva
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“Incipient and actual attacks upon the integrity of science have led scientists to recognize their dependence on particular types of social structure. Manifestos and pronouncements by associations of scientists are devoted to the relations of science and society. An institution under attack must re-examine its foundations, restate its objectives, seek out its rationale. Crisis invites self-appraisal. Now that they have been confronted with challenges to their way of life, scientists have been jarred into a state of acute self-consciousness: consciousness of self as an integral element of society with corresponding obligations and interests.”
During the Brexit discussion

Britain has had enough of experts, says Gove

Brexit campaigner offers to have disputed EU contribution figure audited

Justice Secretary Michael Gove takes part in a live Sky News Q&A on Brexit © PA

Henry Mance, Political correspondent JUNE 3, 2016

https://www.ft.com/content/3be49734-29cb-11e6-83e4-abc22d5d108c
“Scott Pruitt, the administrator of the Environmental Protection Agency, has announced that he alone will decide what is and isn’t acceptable science for the agency to use when developing policies that affect your health and the environment.”

Mr Pruitt is a lawyer.

The credibility of science is under threat

• “Speaking as a scientist, cherrypicking evidence is unacceptable,” Hawking said. “When public figures abuse scientific argument, citing some studies but suppressing others, to justify policies that they want to implement for other reasons, it debases scientific culture.”

• https://www.theguardian.com/science/2018/mar/14/i-would-not-have-survived-nhs-enabled-stephen-hawking-to-live-long-life
This is our new reality

https://thenorwichradical.com/2017/01/12/post-truth-politics-and-the-war-on-intellect/
Reproducibility

If studies cannot be replicated then this brings the whole credibility of the scientific endeavour into question.
Conducted replications of 100 experimental and correlational studies published in three psychology journals using high-powered designs and original materials when available.

- Replication effects = half the magnitude of original effects (substantial decline)
- 97% of original studies had significant results
- 36% of replications had significant results

https://osf.io/ezcuj/
UK Research Integrity Enquiry

- "looks at trends and developments in fraud, misconduct and mistakes in research and the publication of research results."

- Oral Evidence session 6
  March 2018

Early days in US

• Committee on Reproducibility and Replicability in Science with the National Academies of Science

• First meeting Dec 2017 – meetings each second month.

http://sites.nationalacademies.org/dbasse/bbcss/reproducibility_and_replicability_in_science/index.htm
• Opinion: Is science really facing a reproducibility crisis, and do we need it to?
• Daniele Fanelli
• “In light of multiple recent studies, there is no evidence that scientific misconduct and QRPs have increased. The number of yearly findings of scientific misconduct by the US Office of Research Integrity (ORI) has not increased, nor has the proportion, of all ORI investigations, that resulted in a finding of misconduct.”
Recommendations

• DATA HANDLING
• 4. Researchers should make their data available for public inspection after publication of their results.
• 5. Researchers should experiment with born-open data—data archived in an open-access repository at the moment of its creation, and automatically time-stamped.

# List of scholarly commons & charters

Over 90 declarations and position statements from around the world

<table>
<thead>
<tr>
<th>Statement/declaration</th>
<th>Year</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco Declaration on Research Assessment</td>
<td>2012</td>
<td><a href="http://www.ascb.org/dora/">http://www.ascb.org/dora/</a></td>
</tr>
<tr>
<td>Force11 Joint Declaration on Data Citation Principles</td>
<td>2014</td>
<td><a href="https://www.force11.org/datacitation">https://www.force11.org/datacitation</a></td>
</tr>
<tr>
<td>FAIR data principles</td>
<td>2015</td>
<td><a href="https://www.force11.org/group/fairgroup/fairprinciples">https://www.force11.org/group/fairgroup/fairprinciples</a></td>
</tr>
<tr>
<td>The Hague declaration on Knowledge Creation in the Digital Age</td>
<td>2015</td>
<td><a href="http://thehaguedeclaration.com/">http://thehaguedeclaration.com/</a></td>
</tr>
<tr>
<td>Principles of the Scholarly Commons</td>
<td>2017</td>
<td><a href="https://www.force11.org/scholarly-commons/principles">https://www.force11.org/scholarly-commons/principles</a></td>
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http://tinyurl.com/scholcomm-charters
All of these statements reflect Merton

• The four Mertonian norms of science (1942)
  – **universalism**: scientific validity is independent of the sociopolitical status/personal attributes of its participants
  – **communalism**: all scientists should have common ownership of scientific goods (intellectual property), to promote collective collaboration; secrecy is the opposite of this norm.
  – **disinterestedness**: scientific institutions act for the benefit of a common scientific enterprise, rather than for the personal gain of individuals within them
  – **organized scepticism**: scientific claims should be exposed to critical scrutiny before being accepted: both in methodology and institutional codes of conduct.
Open data is a core principle

Open Science Monitor - European Commission. 28 March 2017
http://ec.europa.eu/research/openscience/index.cfm?pg=home&section=monitor
The challenges of implementing Open Science
We need institutions to play along

• “Improving the quality of research requires change at the institutional level”
  • Science as an open enterprise The Royal Society Science Policy Centre report 02/12 Issued: June 2012 DES24782 https://royalsociety.org/~/media/policy/projects/sape/2012-06-20-saoe.pdf

• “Universities and research institutes should play a major role in supporting an open data culture”
Roadmap for institutions

- LERU paper on Open Science was approved by the Rectors’ Assembly last weekend.
- Electronic version published of the paper - 29th May 2018
- Launch event in Brussels - 12th June 2018
- Includes “The eight dimensions of open science: a roadmap for universities”:
  - The future of scholarly publishing
  - The European Open Science cloud (EOSC)
  - FAIR data
  - Skills
  - Research integrity
  - Rewards
  - Altmetrics
  - Citizen science
Some institutions are standing up

Stand out from the crowd by Steven Depolo. Flickr Licensed Under CC BY 2.0.
TU Delft Strategic Framework 2018-2024: what does it mean for Open Science?


Impact for a better society

TU Delft Strategic Framework 2018-2024

"Utrecht University aims to operate at the forefront of Open Science."

The University Strategic Plan 2016-2020

University of Reading’s ‘vision statement’

https://www.reading.ac.uk/research/open-research.aspx
• Successful open research themed conference style event at Reading at end of March 2017
• Decided to create a statement about our overarching principles a philosophical foundation about the benefits of adopting these kinds of practices – the OA and RDM policies sit under this.
• Pre-testing showed need to translate in very clear terms - it is very easy for the audience to read things through their own preconceptions
• Launched the consultation on 20th February, was closed on 14 April. Report being written now (response rate was low).
Challenge 1 - the language problem

http://www.cambridge.org/gb/academic/subjects/psychology/social-psychology/learn-write-badly-how-succeed-social-sciences?format=PB#WGOj6Hggl8f1Wujw.97
• Currently running a consultation with the community to understand attitudes towards Open Research

• Phase 1 of the survey closed on 21 May, will finally close 4 June

• Over 300 individual responses to date
Cambridge survey focused on **Content & Infrastructure**

Development seemed too conceptual

- **Open Content**
  - Open access to research publications (OA)
  - Open data
  - Open educational resources (OER, including open courseware)
  - Open bibliography (also known as open metadata)
  - Open source software (OSS)

- **Open Development**
  - Open development (also known as open development method, ODM)
  - Open educational practices (OEP)
  - Open peer review
  - Open science/open research
  - Open innovation

- **Open Infrastructure**
  - Open standards
  - Open systems

Type of researcher
Lack of clarity

• Answers to: Are there any other ways you are working in an open manner?
  – ‘I realise from previous section that I am so engaged - wasn't familiar with the term prior to this survey’
  – Several said:
    • ‘Sharing with colleagues in my department’ and
    • ‘Presenting at conferences’
Challenge 2 - disciplinary differences

Comic by XKCD - [https://xkcd.com/435/](https://xkcd.com/435/)
## Disciplinary specific

<table>
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<tr>
<td>Biomedical researchers</td>
<td>actively practice open research</td>
</tr>
<tr>
<td>Clinical researchers</td>
<td>practising open research</td>
</tr>
<tr>
<td>Population and public health researchers</td>
<td>experience challenges in data sharing that need addressing</td>
</tr>
<tr>
<td>Humanities researchers</td>
<td>have very little experience of data sharing and seemingly not much could motivate them to share their data</td>
</tr>
<tr>
<td>Social science researchers</td>
<td>little experience of data sharing and reuse and perceive minimal benefits from data sharing</td>
</tr>
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[https://dx.doi.org/10.6084/m9.figshare.4055448](https://dx.doi.org/10.6084/m9.figshare.4055448)
Research is changing and work conditions are changing. It might not be a good time.

Challenge 4 – need to incentivise

Image: Flickr Jason Taellious reward – CC-BY-SA 2.0
One group that must step up is that to which I belong: academic leadership.

Academic institutions can and must do better. We should be taking multiple approaches to make science more reliable. One of the most effective (but least discussed) is to change how we appoint and promote our faculty members.

Our processes should encourage evaluators to say whether they feel candidates’ work is problematic or overstated, and whether it has been reproduced and broadly accepted.

http://www.nature.com/news/faculty-promotion-must-assess-reproducibility-1.22596
UK institutions incentivising open scholarship

• One institution reviewing promotions around “what is excellence and how do we measure it?” in which “excellence in openness” is being considered.

• Two institutions offer “Open Scholar of the Year” awards, one of which also offers a competition for ECRs / PGRs, the prize for which would be filming of a mini documentary about their research so that they can promote it to a wider audience.

• One institution reported considering rolling up their open data and paper policies into a broader ‘open science’ policy.

• In Ireland they have some system level openness indicators:
  – % of publications deposited in Open Access repositories
  – Number of researchers trained in FAIR data management
• “Open Scholarship and Open Science: Recognition and Reward”
  https://www.mendeley.com/community/open-scholarship-recognition-and-reward/ open to all to access and contribute to.

• Research Data Sharing includes a folder entitled: “Rewards and Incentives for Data Sharing”
  https://www.mendeley.com/community/research-data-sharing/
In summary….

• Institutions need to step into this space. But:
  – Language is a problem
  – Solutions look different to different disciplines
  – Researchers feel under siege
  – The reward structure is crucial
Thanks!

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