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Open Science and its discontents

A REVIEW OF THE STATE OF THE ART



What is Open Science

- Open Access
 - Free access to research publications
- Open Data
 - Funders, publishers and government agents are extending the requirements for data management to include data management and stewardship plans for publicly funded research.
- Open Science collaboration
 - It includes different type of outputs such as open code, open hardware, the use of collaborative platforms between scientists and the "citizen-science" phenomenon



Open Data

- FAIR - Findability, Accessibility, Interoperability, and Reusability
 - Beyond proper collection, annotation, and archival, data stewardship includes the notion of ‘long-term care’ of valuable digital assets, with the goal that they should be discovered and re-used for downstream investigations, either alone, or in combination with newly generated data.
 - **Availability and Access:** the data must be available as a whole and at no more than a reasonable reproduction cost, preferably by downloading over the internet. The data must also be available in a convenient and modifiable form.

Open Data

- **Re-use and Redistribution:** the data must be provided under terms that permit re-use and redistribution including the intermixing with other datasets.
- **Universal Participation:** everyone must be able to use, re-use and redistribute - there should be no discrimination against fields of endeavour or against persons or groups. For example, 'non-commercial' restrictions that would prevent 'commercial' use, or restrictions of use for certain purposes (e.g. only in education), are not allowed.

EU Open Science

- The EU Open Science approach which will be incorporated in FP9 will include Open Access, Open Data and Citizen Science
- There are currently expert and stakeholder working groups on indicators, rewards and incentives as well as the other issues implied by Open Science
- https://ec.europa.eu/info/research-and-innovation/strategy/goals-research-and-innovation-policy/open-science/open-science-monitor_en

Some undiscussed tradeoffs

Open science and the research community



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Open Access: Requirements

- Horizon Europe will require that all results from EU funded research must be Open Access
- The preferred model of OA in Sweden is Gold
- All Swedish funders require that research results are made Open Access. There is an additional budget for Open Access publication included automatically in all grants.

Open Access: Trade offs

- The APC subsidy in research grants is small per grant but on a research group or university level it is an opportunity cost in terms of research foregone
- Sweden has moved to a centralised model of paying for APCs and this eliminates one set of distributional problems but not all!
- Several studies have shown that there is a citation advantage connected to OA. Thus we may be introducing a potential source of inequality in the scientific community. Those who can pay will be better cited

Open Data: Benefits

- This openness refers to the scientific and funder communities. For science and mainly STEM, Open Data is a way of increasing efficiency and avoiding unnecessary duplication of effort. The latter is becoming endemic in medical science.
- All research groups will have to devote time to making their data accessible and re-useable.
- Possible benefits include potential to reuse data for pedagogical purposes

Open Data: Tradeoffs

- For those working in qualitative research or with sensitive groups, the open data issue may create problems of access in the future
- For the individual researcher or research group, the time taken for compliance is a cost that is not compensated by the increased availability. This cost may decrease over time but whose horse should starve while the grass is growing?
- Shared data requires common language to facilitate meta issues like keywords, etc. – potential linguistic issues particularly for qualitative research



Open Data: Tradeoffs

- The rules of engagement with open data are still unclear.
 - Science does not reward mere duplication of effort
 - Will it be allowed for another group of researchers to reuse the data and publish on it?
 - Data archiving could be potentially expensive for small organisations and for those on the wrong side of the digital divide



Implications for research

Individuals, research groups and policy

Implications for research

- The majority of the research community supports the efforts to move to an open system
- The current system is flawed but none of the alternatives on the table is superior
- Open is neither cheaper nor necessarily better
- The argument that increased access is owed to the public must be assessed not as a moral imperative but in terms of the value for money.
- Scientific papers are not written for public consumption so paying large sums to make them available to a wider public is a dubious investment

Implications for publishing strategy of the individual or group

- Portfolio approach may be viable
- Publication of working papers prior to submission will have to be severely restricted as papers are increasingly being subjected to a regime similar to patenting.
- Consider the trade off between JIF and dissemination, communication
 - Placing content in the right venue is critical because every publication costs not only in time but in funding



From CVs of quantity to CVs of quality

- The days of the overly long CV may be coming to an end. This has implications for the merit system and how researchers are evaluated for jobs.
- Major adaptation implications for fields in the humanities and the social sciences with tradition of lone wolf research and even for fields with loosely coupled groups



Other potential implications for research

- Size of group and task distribution may be impacted
- Increasing importance of standardisation and meta data structures
- Unclear what is the potential impact of globalised meta data structures for local collaborative practices (linguistic challenges)

Policy's role

- Open Access requirements have increased the profitability of scientific publication for publishers, it provided them with a new business model
- The increased emphasis on publication & bibliometrics by policymakers and funders is an undiscussed contributing factor to the mess that exists in scientific publication and may well be the single most important obstacle to increasing openness.