



GYA Position Statement on Open Science

Making Open Science Possible

The Open Science movement - giving free Internet access to scientific results and data - is a revolutionary development in the way science is made public. It has profound implications for the way in which libraries, data centres, researchers, universities, publishers, and funding bodies operate and interact. Most significantly, it offers opportunities to foster collaboration between scientists in the developed and the developing world, as well as between scientists and interested non-scientists. Recent examples can be seen in the 'Galaxy Zoo' project, where the public can help astrophysicists classify images from the Hubble telescope, or the 'open source malaria drug discovery program', a network of scientists openly sharing drug development data. With initiatives like these, Open Science may foster the transformation of scientific research from a primarily academic, First World activity to a truly global endeavour.

As the Open Science movement evolves, young scientists need to play an active role in shaping its future. Early career researchers are often on the frontline of knowledge creation, and involving them ensures they have a say in how and where their data is distributed. If the Open Science movement is to truly take hold, it will require young scientists to adopt new ways of disseminating the results of research, and to carry these forward as their careers mature.

Despite the promise of positive change, several obstacles stand in the way of realizing Open Science, ranging from practical to institutional features of contemporary science practices. Chief among these are:

- (1) *financial sustainability*: a new model for sharing research results must be one that is financially sustainable in the long term. Publishing houses, institutions and scientists must work together to develop a systemic, fair way to disseminate research which protects poorly funded research fields and groups as well as developing countries. It should not put the financial burden of publishing squarely on the shoulders of the authors.
- (2) *scientific sustainability*: traditional criteria to evaluate scientific success does not recognize and reward scientific efforts to share data and publications through open access platforms. If we want open science to be possible, these criteria need to be revised so that all high-quality contributions to the development of scientific research are recognised and rewarded. At the same time, open science requires a publishing model that limits overabundance of information and helps to avoid a 'data-deluge'. Too much or unmanageable publications and publication-supporting data makes open science untenable.
- (3) *data sustainability*: the creation of publicly accessible data archives presents problems of long-term storage. This is particularly urgent in the case of the high-volume, high-velocity,

and/or high-variety datasets ('big data') obtained through recent technologies, which require new forms of processing to enable discovery. What digital format should be used, and how should data be curated and organised so it can be accessed in the future? What happens if the commercial or government organisations tasked with maintaining such archives become defunct?

The Global Young Academy feels that the broad aims of the Open Science movement are in the best interest of young scientists, and in the best interest of science itself. Therefore we advocate:

- That publishers and funding agencies work towards a publishing model that allows free and public access to the results of publically funded research. This access should be extended, free of charge, to those working in developing countries. Involving young scientists in developing such a model is a key factor in ensuring its long-term success.
- That funding bodies and research institutions adequately recognize work published in open access journals and online, as well as work involved in collecting, curating and sharing information (whether data or papers), rather than assuming journal impact factors as a suitable proxy for scientific excellence.
- That funding bodies recognize and encourage the development of innovative Open Science projects by allocating funding to projects which embrace the tenets of the Open Science movement. Grant applications should not be penalized if the proposed project outcome is a publically accessible data set rather than a publication in a conventional journal; the publication of both data and claims produced by any one project should be supported and rewarded.
- That a long-term strategy for data storage and the maintenance of data archives must be developed. As the Open Science movement grows, governments, academics and publishing houses are starting to develop strategies to ensure data is freely available for future generations. The planning of future data storage, such as the ELIXIR initiative launched by the European Union, need to involve early career researchers as well as senior academics. Young researchers are likely to have valuable knowledge of which types of data need preserving in the long term, and how this is best realised, given (1) the high stakes that these issues have for the development of their own career; (2) their recent experiences in data gathering; and (3) their exposure to digital means of data dissemination, which is likely to be more extensive than that of academics who spent most of their career without these technologies.

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About GYA

The Global Young Academy, founded in 2010, serves as the voice of young scientists around the world. Members are chosen for their demonstrated excellence in scientific achievement and commitment to civil society. Currently there are 172 members from 54 countries.

Learn more at: <http://www.globalyoungacademy.net/>