



Engaging Open Science Key Stakeholders in South Africa's Higher Education Institutions: Report

Hosted by

**Training Centre in Communication (TCC Africa)
and PLOS (Public Library of Science)**

for the

**University of Pretoria, Stellenbosch University,
Sefako Makgatho Health Sciences University and
Durban University of Technology Academic
Community**

Introduction

Why Open Science

The desire to make a positive impact on our way of life is what has driven research in the academic world. Man has always desired to understand the unknown and how to optimise and utilise that knowledge to make lives much better. Historically, much of the resulting outputs of this research were locked behind paywalls, whether because of restrictions from publishers or funder mandates not existing around openness. More recently however, with concerted action from a wide range of stakeholders, including researchers, funders and publishers, the trend has moved towards making scientific research (and its supporting data) available to any member of an inquiring society, seeking to return scholarly publishing to its original purpose: to disseminate knowledge and allow that knowledge to be built upon for the benefit of humanity and the planet.

As defined by the UNESCO Recommendation on Open Science, [Open Science](#) is a movement aiming to make science more open, accessible, efficient, democratic and transparent. The transition to Open Science allows scientific information, data and outputs to be more widely accessible (Open Access) and more reliably harnessed (Open Data) with the active engagement of all relevant stakeholders (Open to Society).

Licensing conditions that allow reuse, redistribution, and reproduction from professionals to citizen are intrinsic to Open Science. Permissive licenses to articles, research data, laboratory notes, analysis and the methodology of research facilitate collaboration and contributions from others, increased ability to reproduce and build on research as well as to participate in the global scientific endeavor.

Open science provides swift paths from research to the production of new products and services. It reduces repetition of research and the consequent wastage of scarce resources. It should be noted that the effect of Open Science on institutions is evident e.g the University World Rankings, the more you publish open access, the more opportunities to collaborate and address the issues around the sustainable development goals and the better our standing on these platforms.

A Case for Open Science in South Africa

Excerpt from the Draft South African National Open Science Policy

Society is rapidly advancing towards a state of increased global interconnectedness - often described as the Fourth Industrial Revolution – and is characterized by exponentially increasing data generation, distribution, and analysis capacity across broad segments of society not traditionally involved in the research endeavour. Global experience has demonstrated that open access to data and publications can lead to an acceleration in scientific breakthroughs and act as a catalyst for the research and innovation enterprise. The societal benefits are quite marked – dependent on the scope and breadth of data availability, this can extend from research and innovation to drivers of socio-economic development, social welfare, and public perception of transparency.

Open Science has a significant role to play in countering the emergence of popular pseudo-scientific agenda. It is viewed as a critical mode of reach in the 21st century, and is driven by three key inter-related drivers:

- Broadening of the benefits of science, both to research and to society at large;
- Recognition that reproducibility and validation of scientific results are required for science to remain credible; and
- Technology changes that both enable, and require, new mechanisms for scientific endeavour.

Inclusive growth and sustainable development are central to the African Union's Agenda 2063. The role of open, collaborative science, technology, and innovation (STI), central to Open Science policy, is critical - from disaster preparedness and prevention to biodiversity, conservation management, and climate resilience.

The growing, global adoption of Open Science as a systemic approach toward the democratization of knowledge is establishing a global commons for science and innovation. Not only does this enable active participation by South Africa within a global knowledge enterprise and knowledge economy, but it is critical in addressing global challenges that face humanity today.

Why Open Access

Open Access seeks to return scholarly publishing to its original purpose: to disseminate knowledge and allow that knowledge to be built upon for the benefit of humanity and the planet.

By "open access" to [peer-reviewed research literature], we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

Democratizing Higher Education

Cost should not be a barrier to accessing research, with significant amounts of research still locked behind paywalls and only accessible at high cost, this creates a research and innovation divide. Open Science and Open Access can democratize higher education, by providing equitable access to literature resources to academic communities.

By giving researchers and readers greater access to published scientific research, increases the opportunities for them to utilize this knowledge in their own research, to build upon it, and enable further discovery. Open access to knowledge increases the potential for collaboration and engagement in the global research endeavor.

Open Science and Open Access mean that students have access to the knowledge they need and are not artificially limited by the selection of scholarly journals their campuses are able to provide access to.

Open Access bridges the gap between the "haves" and the "have nots" as research and knowledge is accessible and shared widely through an open license.

Open Access Movement in South Africa

Excerpt from [SANLIC](#) website

The Open Access movement in Africa must be far more encompassing – it has to be developed on philosophy and purpose that is relevant to the African environment and its challenges. The movement in Africa must have a transformative worldview of Open Access, which is driven by social justice imperatives and equity principles for inclusion resulting in the growth and development of society.

To improve the dissemination (or distribution) of South African research, it is critical to contextualize South African open access practices within the broader African open access landscape.

At the epicenter of the open access movement in South Africa are the principles of social justice, the denorthernisation of the publishing landscape, and the advancement of platforms for the dissemination of South African scholarship.

South African National Library and Information Consortium (SANLiC) and its members are fully committed to:

- Promoting Open Access for the advancement of South African research and research production through the increase in access to scholarly information
- Reducing the overall cost of library subscriptions, and
- Seeking alternative forums for the distribution of South African scholarship. (SANLIC 2020)

The South African National Library and Information Consortium (SANLiC) has signed a number of agreements for South African Higher Education Institutions. The list of current [negotiated agreements](#) is now available allowing South Africans to publish in Gold Open Access journals.

Since the inception of the policy on Article Processing Charges in 2015, the Department of Library Services (DLS) at the University of Pretoria supported researchers with Article Processing Charges (APCs) also known as publication fees. This allows researchers to publish articles in accredited, peer-reviewed and Open Access Journals. The DLS is also part of the (SANLiC) agreements and has recently signed the Read and Publish



Agreement with Wiley, Emerald, and the Association for Computing Machinery (ACM) publishers. These are efforts to advance open science practices to increase Gold Open Publishing at the University of Pretoria.



Desired Goal of the Meeting

On 21st June 2022, Training Centre in Communication (TCC Africa), University of Pretoria, and PLOS, partnered for a workshop engaging open science key stakeholders from the University of Pretoria, Sefako Makgatho Health Sciences University, Stellenbosch University and Durban University of Technology Academic Community hosted at the University of Pretoria's Faculty of Health Sciences and delivered using a hybrid format (in person and via Blackboard Collaborate Ultra).

The purpose of the meeting was to ascertain key stakeholders' views on Open Science with a focus on enablers and barriers to implementation in South African higher education institutions. This engagement is part of a multiphase project aimed at optimizing the implementation of the open science policy with high education institutions. Information gathered from this phase of the project will guide future engagements which includes an engagement with researchers within high education institutions and National meeting with key stakeholders at National level.

Workshop proceedings summary

List of attendees

1. Tivani Mashamba-Thompson (Faculty of Health Sciences, University of Pretoria) (Organiser)
2. Anwani Nekhumbe (Faculty of Health Sciences, University of Pretoria) (Organiser)
3. Joy Owango: Training Centre in Communication (TCC Africa) (Facilitator)
4. Dr Carol Nonkwelo (Senior Director: Research, Innovation & Postgraduate Education), University of Pretoria (Open Science Key Player)
5. Prof Michael Pepper (Director: The Institute for Cellular and Molecular Medicine), University of Pretoria (Open Science Key Player)
6. Mr Lazarus Matizirofa (Deputy Director Sub-directorate: Scholarly Communication, Digital Systems & Services), University of Pretoria (Open Science Key Player)
7. Dr Malefetjane Benny Phaladi (Director: Library Services), Durban University of Technology (Open Science Key Player)
8. Ms Ellen Tise (Senior Director: Library and Information Services) Stellenbosch University (Open Science Key Player)



9. Ms Sarah Kibirige (Director: Library and Information Services), Sefako Makgatho Health Sciences University (Open Science Key Player)
10. Roheena Anand: PLOS (Open Science Key Player)

Open Science Adoption in Universities

According to the audience, the current standing on adoption and implementation of Open Science especially in universities is at a slow pace due to a myriad of challenges such as lack of standardized open science policies, poor support from the administrative leadership in Universities, and lack of funding.

Significance and challenges of Open Science in the context of the Library, Research Office Directors, and Researchers

A question was posed to the audience on their expectations as well as some of the challenges in Open Science from an administrator, researcher, or competitor's perspective.

Terminology/confusion around this was identified as a key issue, with Open Access being used interchangeably with Open Science, and many of the issues focussing on Open Access.

Nine pillars to Open Science (guided by the taxonomy of what Open Science should be) were identified as follows (Foster 2015):

- Open Access
- Open Data
- Open Reproducible Research
- Open Science Evaluation (speaks to rewards and incentives)
- Open Science Policies
- Open Science Projects
- Open Science Tools
- Open Peer review
- Openness to diversity of knowledge



Open Access was recognized for its ability to increase the visibility (and impact) of research outputs as well as encourage access to collaborative opportunities among researchers and engagement with a broader community.

From the librarians' perspective, libraries have been ready and have been advocating for Open Access adoption in their institutions and it's the rest of the scientific community and research office that needs to catch up. For instance, the University of Pretoria has the UPSpace repository which republishes the institution's publications for free. The first of its kind in Africa.

Stellenbosch University, like the University of Pretoria, has well-developed institutional repositories. They have also been at the forefront of promoting Open Access publishing by providing a publishing platform of 23 journals and some South African Journals, which has increased open access publishing. In 2016, articles published as open access at Stellenbosch University accounted for over 50% of the outputs produced, with 57% produced in 2021.

However, the audience also acknowledged the obstacles in the reception hence the adoption of Open Access. According to statistics from the SANLIC Report as quoted by one of the audience members, between 2014 and 2019; 60% of South African authorship has been buried behind subscriptions walls; even though South African authorship is a public-funded research output and only 45% of South African journals are open access emphasizing a contradiction of how researchers are expected to fix socio-economic challenges when published work to address these is buried behind paywalls.

The need to define and differentiate Open Science and Open Access, which are commonly used interchangeably, and the need to raise awareness of the difference were also mentioned.

Lastly, the audience agreed on the need for the establishment of a standardized Open Access publishing policy for publishing research papers, theses, dissertations, and research data. The establishment of an Open Access publication fund was also suggested to assist researchers with APCs.

Value proposition of Open Science to the office of the Research Directorate, Library Services and Researchers

Different perspectives were given in response to the value proposition to various offices in the institution. The key message, however, remained the same. All stakeholders involved, from the researcher to the Research Office, need to address Open Science with one voice. Collaboration and data sharing between these offices will lead to better infrastructure and more sustainable systems that can make valuable contributions to society.

Some of the suggestions with effect to the collaboration include:

- Having an institutional board that involves the library, research offices, and other important stakeholders,
- For the library and research office to encourage their faculties to adopt Open Science

Understanding the importance of including Open Source (infrastructure and code) as part of the Open Science culture in supporting the infrastructural support of the institution.

On who plays a role in these categories and which pillar would be more valuable to convince the institutional leadership, the audience suggested that the most valuable would be;

- Open Science Evaluation – led by Research Office (incentivizing research production)
- Open Science Policies – led by Research Office should lead
- Open Data – challenges with IP led by the Research Office

Challenges to adopting Open Science

Some of the challenges identified and reiterated during the discussion were:

Open Science

- Privacy, intellectual property (IP) issues, and copyright.
- Data protection and data sharing should be debated. South Africa/ Africa is held back by Ethics and Rights, where we end up losing sight of the final benefit of the research.

- Academic take-up of Open Science is very poor, and the lack of the buy-in on Open Science can be attributed to the researcher. Researchers are not involved in the conversation.
- Lack of understanding and awareness re Open Access and Open Science

Open Access

- Even with offering support through Article Processing Charges (APC) funding, authors/researchers still do not understand what it is.
- Stigma with Open Access in the research community with some saying publishing in an Open Access journal is inferior.
- Article Processing Charges (APCs) have become even more expensive.
- Different faculties have different needs, there is a challenge in the knowledge of Open Access, cost, and how people will benefit from open access, especially in Humanities and social sciences. There are hardly any opportunities to collaborate or share data.

Possible solutions and key takeaways

In conclusion, the audience gave their suggestions on how to not only drive the dialogue around Open Science and Open Access but also on ways that key stakeholders can get involved. The key takeaways in summary of the above are that:

- Libraries should have been more inclusive in their transformative agreements
- Communication should have been directly from the leaders, not from the bottom to the top.
- There should be nurturing of the Open Science culture from the administration to the researchers.
- There should be an open dialogue within the institutions involving the research office, the Library, and the ITC.
- More tools should be developed to promote Open Science such as an article processing charge (APC) dashboard that can help the Library determine who is publishing where.
- Different perspectives of different faculties and departments should be taken into consideration.
- There should be buy-in across the system, promoting development and sustainability.
- Support for Open Science should be backed by Data.
- Innovation funding should be set aside for Open Science Initiatives.
- Adoption and use of patents to address issues brought about by the use of Intellectual property (IP).



References

FOSTER consortium. 2015. "Resources | FOSTER *The Future of Science Is Open*"
<https://www.fosteropenscience.eu/resources>.