

Bridging the Knowledge Gaps: Building on the UNESCO Recommendation on Open Science



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Global importance of open science

Achieving SDGs and overcoming the global challenges require an efficient, equitable, transparent, collaborative and inclusive science, leading to sustainable solutions.

Everyone has the right to freely share in scientific advancement and its benefits.

Article 27 of the Universal declaration on Human Rights

Need for science to be more **connected to societal needs** and **more accessible for all**. Need to **bridge the knowledge and technology gaps** between and within countries.



2021 UNESCO Recommendation on Open Science



- The first international normative instrument on open science;
- Provides the first internationally agreed definition of open science;
- Spells out the common core values and guiding principles of open science;
- Addresses multiple actors and stakeholders of open science;
- Recommends actions on different levels
- Proposes innovative approaches for open science at different stages of the scientific cycle;
- Calls for a **comprehensive open science monitoring framework**.



Open science increases scientific collaborations and sharing of information for the benefit of science and society.

opens the processes of scientific knowledge creation, evaluation, and communication to societal stors beyond the scientific community.

makes multilingual scientific knowledge openly available, access ble and reusable for everyone.

For all scientific disciplines

OPEN

SCIENCE



Common values and guiding principles, diverse pathways to open science.





Four key Pillars of open science



Open Scientific Knowledge: scientific publications, research data, software, source code, hardware and educational resources available in the public domain or under copyright with open license

Open Science infrastructures: scientific equipment or sets of instruments, knowledge-based resources such as collections, repositories, archives and scientific data, open computational and digital infrastructures

Open engagement of societal actors: collaboration between scientists and societal actors beyond the scientific community, opening up practices and tools that are part of the research cycle by making the scientific process more inclusive and accessible to the broader inquiring society

Open dialogue with other knowledge systems: recognition of richness and complementarities between diverse epistemologies, including indigenous knowledge systems

Open Engagement with societal actors: a two-way path to connect science and society



Open science allows societal actors to engage in scientific processes, thus contributing to democratization of knowledge, fighting misinformation, addressing existing inequalities, and guiding scientific work towards solving societal problems.

Examples

- <u>Citizen science</u>
- <u>Community-based participatory research</u>
- <u>Community-based monitoring and citizen</u> <u>observatories</u>
- <u>Crowdsourcing for tasks such as data collection</u> or processing

<u>...</u>



Access to scientific knowledge should be **as open as possible**, but **sometimes access may need to be restricted**, for example, to protect:

- human rights,
- confidentiality,
- intellectual property rights,
- personal information,
- threatened or endangered species,
- sacred and secret indigenous knowledge.

Open science encourages scientists to develop tools and methods for managing data so that **as much data as possible can be shared, as appropriate**.



Areas of action for opening science at different levels



Promoting a **common understanding of OS** and its associated benefits and challenges, as well as the diverse paths to OS

Developing an enabling policy environment for OS

Investing in infrastructure and services which contribute to OS

Investing in training, education, digital literacy and **capacity-building**, to enable researchers and other stakeholders to participate in OS

Fostering a **culture of OS** and aligning incentives for OS

Promoting **innovative approaches to OS** at different stages of the scientific process

Promoting **international and multistakeholder co-operation** in the context of OS with a view to reducing digital, technological and knowledge gaps.



UNESCO Supports the implementation of the Recommendation on Open Science

Role of UNESCO

- Raise awareness and building capacity among different actors
- Access to information and facilitate collaboration through UNESCO Programmes
- Forum for exchange of ideas, good practices, lessons learned
- Support for open science policy development
- Mobilize the Global OS Partnership and build coalitions to advance OS
- Monitor open science status, trends and impacts





Key achievements so far

- Development of standards and guidance for the implementation of the Recommendation
 - UNESCO Open Science Toolkit with guides, checklists and factsheets
 - UNESCO Open Science Outlook
 - UNESCO Open Science Capacity Building index
 - UNESCO Index of Open Science Knowledge Sharing Platforms

Impacts on policy development

- 11 countries adopted more holistic open science policies/policy instruments since
- Development at different stages of open science policies/strategies/roadmaps, particularly in Africa
- Integration of open science principles in STI policies
- Development of regional open science platform/strategies: AOSP, SADC, ECOWAS, EASTCO

Strengthened and expanded partnerships and networking

- UNESCO Open Science Partnership (over 70 members)
- UNESCO Open Science Working Groups (over 1000 experts)



Open Science Outlook: A snapshot of open science from around the world

For open science to reach its full potential, it must be a truly global and equitable phenomenon.

Open science is growing—but unevenly.

Obstacles remain, linked to existing inequities. There are:

- differences among pillars of open science.
 - differences among disciplines.
 - differences across contexts.

Collective, collaborative and coordinated action and investment are needed to accelerate the transition to a truly global, equitable open science.





- •Open access scientific publications in rapidly growing, yet only 1/3 of all scholarly literature (since 2000) is currently open access.
- •A growing number of countries and institutions are adopting or facilitating open access policies and workflows.
- •A range of mechanisms are used to provide open access, with different consequences in diverse local contexts.







Assessment of open science



Strengthening the focus on **people and impact**, not just products



Numbers can not capture quality, impact, representation... Innovative indicators and assessments are needed for open and inclusive monitoring of OS2



Join the Global Open Science Movement



Read the Open Science Outlook:



Join the Open Science Working Groups



Engage in the national and global

discussions

Be in touch! UNESCO Open science website: <u>https://www.unesco.org/open-science</u> Contact: <u>natscience.jak@unesco.org</u>







