

UNESCO Recommendation on Open Science

URL: https://mirea.opensciencespain.org/en/iniciativa/bp34_unesco_en_v01/



Topic: Policies supporting open science, Research data, Open peer review, Citizen science and social innovation, New models of research assessment, Open educational resources

Implementation scale: International

Responsible agents: Universities (governing bodies), Researchers, Research managers, Publishers, Libraries

Location: Worldwide

Key words: research assessment, open data, open knowledge, digital infrastructures, science communication

Start and end date: 2021 -

Sustainability: Yes

Summary

The UNESCO Recommendation on Open Science, unanimously adopted by 193 Member States in November 2021, is the first international normative instrument to establish common definitions, principles, and areas of action for the transition to Open Science, with recommendations for implementation at national and institutional levels.

Promoting organizations

The initiative is promoted by UNESCO and was adopted by its General Conference (41st session, Paris, November 2021) with the participation of Member States. UNESCO acts as the driving organization behind the international framework, recommending its implementation by Member States.

Objectives

The Recommendation was developed in response to complex global challenges—climate change, pandemics, poverty, inequalities, and digital

divides—that require science to be more open, collaborative, and accessible. COVID-19 highlighted how equitable access to scientific information and data sharing can accelerate research and strengthen the links between science, policy, and society.

UNESCO sets out seven areas of action for the transition to Open Science:

1. Promoting a common definition of Open Science and diverse ways to achieve it.
2. Developing an enabling policy environment for Open Science.
3. Investing in Open Science infrastructures.
4. Investing in capacity building for Open Science.
5. Transforming scientific culture and adapting incentives to support Open Science.
6. Promoting innovative approaches to Open Science at different stages of the scientific process.
7. Promoting international cooperation on Open Science.

These objectives are grounded in four core values: quality and integrity through openness and transparency; the collective benefit of science as a global public good; equity and justice through fair exchange among countries; and diversity and inclusion by respecting epistemic pluralism and the participation of all peoples.

The 193 Member States commit to implementing the provisions through legislative and policy measures in line with their governance structures; consulting science, technology and innovation authorities; cooperating through bilateral and multilateral initiatives; and reporting every four years on progress, establishing an unprecedented global monitoring and accountability mechanism.

Beneficiaries and stakeholders

UNESCO's 193 Member States and their national science, technology and innovation systems. The scientific community at all career stages (researchers, academics, citizen scientists), research and higher education institutions, technical and information professionals, regulatory and legislative bodies, scientific publishers and communicators, public and private funders, and civil society—including Indigenous peoples and local communities. Indirectly, society as a whole benefits through the democratization of scientific knowledge, solutions to global challenges, and the reduction of digital and technological divides between countries.

Results

Among others, the principles set out in UNESCO's Recommendation on Open Science will help establish the conditions and practices conducive to achieving Open Science:

- Transparency, scrutiny, critique, and verifiability, which will increase the impact of science on society and strengthen society's overall capacity to solve complex problems.

- Equality of opportunity and access, enhancing participation in science and the benefits society can derive from it regardless of gender, field, funding, or career stage.
- Respect, responsibility, and accountability by all Open Science actors to ensure sound governance of science.
- Collaboration, participation, and inclusion at all levels of the scientific process, overcoming barriers related to language, generations, disciplines, or resources.
- Flexibility in approaches to doing science.
- Sustainability, efficiency, and effectiveness of infrastructures, services, and funding models that guarantee permanent, unrestricted access for all audiences.

Challenges

The recommendations identify key challenges: the undue appropriation and transfer of data from less advantaged countries; high publication costs (APCs) that perpetuate inequalities; tensions between openness and the protection of intellectual property; persistent digital, technological, and knowledge gaps; the transformation of entrenched research assessment systems; and the sustained investment needed in infrastructure and capacity building. Full implementation requires appropriate legislation, effective governance, and long-term multi-stakeholder dialogue.

Interest and transferability

The Recommendation is a good practice because it takes a comprehensive approach through seven areas of action that cover the entire Open Science ecosystem. It establishes, for the first time, an internationally agreed definition, ensuring shared principles and overcoming the fragmentation of earlier initiatives that lacked global consensus.

It promotes coherent national policies by calling on funding and research institutions to adopt the established framework. It includes investment in infrastructures—information technologies, shared platforms, and monitoring systems—recognizing that Open Science requires a solid technological foundation.

Capacity building prioritizes training in data science, skills tailored to different stages of research careers, and open educational resources. This is complemented by cultural transformation through the reform of research assessment systems, introducing indicators beyond the impact factor and addressing one of the main barriers to change.

It promotes innovative approaches through participatory methods, access to infrastructures, and collaboration between researchers and societal actors, democratizing knowledge production. International cooperation encourages cross-border collaboration to tackle global challenges.

Its monitoring system assesses effectiveness, disseminates good practices, and supports long-term strategies, ensuring accountability. The breadth of these areas and the commitment of 193 Member States show that it is the most comprehensive framework for transforming scientific practice toward greater openness and social impact.

Bibliography

- UNESCO Recommendations on Open Science:
<https://doi.org/10.54677/MNMH8546>

Authorship information:

Created on: 20/12/2021

Author of record: Carolina Andreu Ramos

Institution author: Universitat de Barcelona

Automatically generated document from the published entry.