

Draft Factsheet

Equity in scholarly communication for the implementation of open science

This document is part of the [UNESCO Open Science Toolkit](#), designed to support the implementation of the 2021 UNESCO Recommendation on Open Science.

The aim is to provide an overview of the current global scholarly communication system and guidance on embedding equity at its core.

Why does equity in scholarly communication matter?

Equity is key to realizing the promise of open science

1. According to the 2021 [UNESCO Recommendation on Open Science](#), open science is a set of principles and practices that aim to increase the sharing of multilingual scientific knowledge widely and openly for the benefit of all people everywhere and to open the process of contributing to and building that knowledge.
2. Central to this definition is the imperative of equity: open science should ensure fair and reciprocal sharing of scientific inputs and outputs and guarantee equal access to knowledge for both producers and consumers, regardless of geography, background, or identity. This vision is reinforced by Article 27.1 of the Universal Declaration of Human Rights and Article 15 of the International Covenant on Economic, Social and Cultural Rights, which affirm the human right to participate in and benefit from science.
3. The imperative of equity is further strengthened by the United Nations' *Pact for the Future*, which underscores the central role of science, technology, and innovation in achieving a just, inclusive, and sustainable world. The Pact calls for fostering an open and inclusive environment for scientific and technological development, with equitable access to knowledge and science, and stresses that the values of openness and equity must guide international cooperation in science.
4. Taken together, these global normative frameworks provide a clear guidance for placing equity at the heart of open science. A practical means of realizing this vision and central to its fulfilment is equitable scholarly communication, the practice through which researchers create, validate, and share knowledge within and beyond the academic community.
5. In line with the 2021 UNESCO Recommendation on Open Science, equitable scholarly communication requires that its inputs and outputs, including publications, data, metadata, educational resources, software, source code, and hardware, be made openly available in the public domain or under licences that allow access, reuse, adaptation, and distribution on fair terms. As the Recommendation states, these outputs should be "*provided to all actors as quickly*

as possible regardless of location, nationality, race, age, gender, income, socio-economic circumstances, career stage, discipline, language, religion, disability, ethnicity or migratory status or any other grounds, and free of charge”.

The long quest for equity in scholarly communication

6. The pursuit of equity in scholarly communication has deep historical roots. In ancient and medieval societies, knowledge was often deliberately kept secret, guarded by alchemists, artisans, and guilds as a means of maintaining power and preserving dominance and mastery over specialized knowledge, often being transmitted orally from one generation to the next.

7. Gradually, more open systems of exchange emerged. The 17th century Scientific Revolution and the Enlightenment in Europe, alongside the printing press, introduced initial models of the broader dissemination of knowledge through the first scholarly journals. Similar initiatives followed across regions, yet access remained largely restricted to elite institutions.

8. In the 19th century, western journals supported by learned societies and academic communities increasingly adopted commercial practices to expand readership and increase circulation in an emerging periodical market. From the 1970s onwards, the rise of large commercial publishing houses, often through acquiring smaller publishers and society journals, promoted subscription-based models that intensified access barriers and eventually resulted in escalating subscription costs which outpaced library budgets and inflation.

Technological advances, new models of access and unintended consequences

9. The advent of the internet and digital technologies in the late 20th century revolutionized scholarly communication, enabling new ways to collect, store, manage, and transmit vast volumes of information across borders. These advances created unprecedented opportunities to reimagine scholarly communication on more equitable and inclusive terms. Early electronic open access (OA) journals, operating without fees, pioneered what is now known as *Diamond OA* or OA without fees for readers or authors. From the early 1990s-2000s, the emergence of discipline-specific preprint servers, and early OA repositories, enabled researchers to share their work more freely and globally paving the way to what is now known as *Green OA*.

10. In parallel, regional approaches also charted equitable paths. For example, some regions of the world pioneered community-owned digital infrastructures, with national information systems and regional networks forming the backbone of scholarly communication. These prioritized bibliodiversity, multilingualism, no fees, and university-led governance.

11. Yet, inequities persisted. The introduction of article processing charges (APCs) for OA publishing in the early 2000s and in some cases now amounting up to thousands of US dollars per article, shifted barriers from readers (and their supporting institutions) to authors (and their supporting institutions), disadvantaging those without financial support. Later-emerged transformative agreements, negotiated between institutions (libraries, national, and regional consortia) and publishers and reliant on APCs, have further entrenched the fee-based model, remaining largely accessible to well-resourced institutions mainly in developed countries and reinforcing structural inequalities despite expanding free-to-read outputs.

12. Over the past two decades, the terminology and conceptualization of different OA models have become more refined, distinguishing between fee-based *Gold OA* (where APCs are required by fully OA journals for immediate access on the publisher's site), *Hybrid OA* (subscription journals offering optional APC-based open access and/or transformative agreements), *Bronze OA* (articles made free-to-read on the publisher's site but without a clear open license and also without a guarantee on always being free-to-read), *Green OA* (free of charge self-archiving in repositories, sometimes after embargo periods), and *Diamond OA* (without fees for either authors or readers).

13. The current scholarly publication system is broad and complex, encompassing models that range from closed, paywalled subscription-based journals to fully OA publications that are free for both authors and readers, and from large commercial to smaller scholar-led and community-driven publishing. These models vary in structure, accessibility, and purpose, and operate with differing levels of sustainability and impact. As part of the wider ecosystem of scholarly communication, they have all contributed to significant advances in the production and dissemination of knowledge. However, as society confronts increasingly complex challenges that demand open science practices and solutions, it has become critical to design and promote equitable models of scholarly publishing that can fully unlock the potential of open science for everyone everywhere.

The urgent need to place equity at the core of scholarly communication

14. Persistent inequities in scholarly communication threaten the exclusion of large portions of knowledge, the integrity of the scholarly record, and the relevance of research to both global and local needs. What gets studied, who can study it, and how findings are communicated to those in a position to act, all shape the kind of future that science helps bring about.

15. Without proactive efforts to design equitable models, there is a risk of forfeiting the transformative potential of digital technologies to achieve the equity they once promised. In practice, failure to revise and implement models that encourage diverse participation means excluding both readers and authors based on nationality, ethnicity, gender, language, age, discipline, socio-economic background, funding status, career stage, and other grounds. Such exclusions not only slow and distort research, but also negatively impact a range of other social activities that depend on it, including education, journalism, medical practice, research-intensive industry, and policymaking.

16. Equity must therefore be recognized and realized as a core aim of scholarly communication and a driving force of open science, ensuring that openness systematically dismantles rather than perpetuates global inequalities in knowledge access and production. This helps ensure that science fulfils its role as a global public good. Realizing equity in practice requires reconsideration of dominant models, collaboration among stakeholders to address systemic inequities, and the fostering of more inclusive approaches to scholarly communication.

What are the key equity-related challenges and systemic imbalances in scholarly communication?

Power concentration and the challenge of commodification in scholarly publishing

17. One of the key equity challenges in scholarly communication is that the existing interconnected systems of scholarly communication and academic reward have led to the concentration of ownership of scientific journals within a small number of large publishing companies.

18. Resulting publishing models can limit equity in different ways, such as restricting terms of use through mechanisms such as copyright-transfer agreements with authors, institutional licensing contracts, and other end-user agreements, and by establishing financial barriers to accessing scholarly content or participating in the scholarly communication process. For example, subscription arrangements and bundled “big deals” restrict access for many readers, while *Gold* and *Hybrid OA* frequently shift costs to authors and their institutions through APCs and APC-based transformative agreements.

19. Although differential pricing and waiver schemes are sometimes offered, these measures are uneven and can place the burden on underfunded researchers and institutions to request exemptions. As a result, while there are recognized costs for dissemination of publicly funded research, these costs are often borne disproportionately by the academic community, while the value of scholarly labor, including peer review, remains largely under-recognized.

20. Moreover, a concentration of ownership among large publishers extends beyond journals to key elements of scholarly communication infrastructure, including submission systems, editorial platforms, citation and indexing databases, and measures of research impact. This means the way research is produced, evaluated, and made discoverable often has limited input from academic communities or editorial boards.

Research assessment of scientific excellence and impact

21. Another major structural barrier to equitable scholarly communication lies in the way research excellence and impact are assessed within institutional and funding systems. Evaluation frameworks remain heavily influenced by proprietary, journal-level indicators such as the journal impact factor (JIF), which play a central role in university rankings and shape decisions on funding allocation, hiring, and promotion. The JIF has been widely criticized for prioritizing prestige and visibility over contextual relevance, collaboration, and openness.

22. These frameworks also tend to incentivize publishing in Anglophone journals, while underrepresenting non-Anglophone journals and those based in developing countries. Assessment practices also frequently privilege traditional publication formats such as articles and book chapters, while undervaluing other types of research outputs (e.g., datasets, software, policy briefs), diverse knowledge systems, and contributions with strong local or societal relevance. As a result, research continues to be assessed primarily through narrow, quantitative measures (e.g., number of articles, JIF, citations, h-index, or funding obtained).

23. Many governments, funders, and institutions are currently addressing the issue of misalignment between the current research assessment practices and metrics and open science values and principles. Global initiatives such as the San Francisco Declaration on Research Assessment (DORA), and the Coalition for Advancing Research Assessment (CoARA), are advancing a shift away from narrow reliance on the JIF toward more responsible, transparent, and holistic approaches that recognize a wider diversity of research outputs and contributions.

Multilingualism

24. Language remains a significant source of systemic inequities in scholarly communication. With English firmly established as the dominant language of global science, many journals, particularly those based in developed countries, do not accept publications in other languages and provide limited support for researchers whose first language is not English.

25. Evidence shows that non-native English-speaking researchers are considerably more likely to be asked to improve their English during peer review, and at times publication workflows also encourage them to pay for English editing/proofing services. These authors are also more than twice as likely to have their papers rejected for language-related reasons compared to native speakers. This places additional demands on scholars from non-Anglophone regions, who must invest more time, effort, and resources to meet English-language expectations, limiting their ability to participate fully in global knowledge production or, depending on their field, to communicate using the most precise terms.

26. Language barriers also affect the visibility and discoverability of research. Many open science infrastructures in non-Anglophone regions do not yet support multilingual metadata, instead relying on national languages and local standards. This reduces interoperability with global systems and can lead to research produced in local languages remaining siloed and less accessible to international audiences.

The digital divide

27. The digital divide, defined as the gap between those who have access to and use Information and Communication Technologies (ICTs) including internet connectivity, internet-enabled devices, and digital literacy skills and those who do not, is another persistent barrier to equitable scholarly communication. According to the International Telecommunication Union, in 2024, 2.6 billion individuals, nearly one-third of the global population, are still offline, unable to access the internet that serves as a basic prerequisite for participation in digital scholarly communication and open science.

28. This inequality extends beyond internet connectivity and basic devices like personal computers. It also encompasses the uneven availability of specialized digital infrastructures, tools, and services that are used to produce, store, process, distribute, and exchange scholarly information. These include, for example, OA repositories, publishing platforms, research data management and sharing platforms, metadata-driven systems, among others. Many countries still lack or have only partially developed open science infrastructures, and access to international or regional open science infrastructures remains uneven. In addition, many researchers and

research-support staff do not yet possess sufficient digital skills needed to effectively use these systems.

Gender gap and bias against marginalized scholars

29. Another significant challenge to equitable scholarly communication is the persistent gender gap in science and limited inclusion of scholars whose identities, geographic locations, or knowledge systems fall outside dominant academic norms. This can affect individuals from historically underrepresented or underserved communities, those working in politically or economically constrained environments, as well as holders of traditional or Indigenous knowledge systems, whose contributions are often undervalued.

30. Although the specific experiences vary, the impacts are well documented, including lower representation on editorial boards and national science academies, fewer invitations to review, longer publication timelines, reduced acceptance and citation rates, and less visibility and public engagement with their work.

Enabling more equitable scholarly communication system: Insights from the 2021 UNESCO Recommendation on Open Science

31. Drawing on the 2021 UNESCO Recommendation on Open Science, an international standard-setting instrument adopted by 193 Members States at UNESCO 41st General Conference, the following suggested actions are intended to address the key challenges highlighted above with a view to reducing systemic inequities in the scholarly communication system and serving the needs of everyone everywhere.

32. Supporting non-commercial, academic, and scientific community-driven publishing models as a common good by

- a. preventing and mitigating the unintended negative consequences of scholarly business practices, such as increased costs for scientists and high article processing charges associated with certain business models in scientific publishing;
- b. ensuring diversity in scholarly communications and supporting non-commercial publishing models and collaborative publishing models with no article processing charges or book processing charges (e.g., *Diamond* and *Green OA* models)
- c. investing in open and community managed infrastructures (e.g., that comply with the Principles of Open Scholarly Infrastructure), protocols, and standards, ensuring academic control, transparency, and long-term sustainability;
- d. encouraging licensing practices that retain author rights and maximize reusability (e.g., Creative Commons);
- e. developing regional and global funding mechanisms to support equitable participation in publishing, particularly for researchers and institutions in low- and middle-income countries.

33. Reviewing research assessment and career evaluation systems in order to align them with the principles of open science by

- a. improving the ways in which the scientific outputs are evaluated with an increased focus on the quality of research outputs rather than quantity, and by fit-for-purpose use of diversified indicators and processes that forego the use of journal-based metrics such as the journal impact factor;
- b. giving value to all relevant research activities and scientific outputs including high-quality FAIR (Findable, Accessible, Interoperable, and Reusable) data and metadata, well-documented and reusable software, protocols and workflows, machine-readable summaries of findings, and teaching, outreach and engagement of societal actors, as well as interdisciplinary and multilingual contributions;
- c. taking into account the fact that diversity of disciplines requires different approaches and that assessment of researchers against open science criteria should be fit for different stages of careers;
- d. incentivizing research that supports public interest science and the development of research relevant to local needs and contexts.

34. Encouraging multilingualism in the practice of science, in scientific publications, and in academic communications by:

- a. supporting multilingual publishing through funds for translation, bilingual abstract requirements, and infrastructure for multilingual metadata with unique digital references;
- b. recognizing and valuing Indigenous, traditional, and community knowledge systems alongside conventional academic outputs, ensuring reciprocity, fair credit, and agency in the publishing process;
- c. supporting regional publishing hubs that prioritize local research priorities;
- d. encouraging international collaborations that include non-Anglophone institutions and support publishing in local languages;
- e. developing discoverability mechanisms (cross-lingual indexing, metadata standards) to connect research across languages and regions;
- f. creating systems that index research across many different sources and provide interoperable platforms for knowledge discovery that prioritize community involvement, governance, and participation.

35. Reducing the digital, technological, and knowledge divides existing between and within countries by:

- a. investing in technical and digital infrastructures and related services, including their long-term maintenance;
- b. supporting digital infrastructures for open science based, as far as possible, on open source software stacks;
- c. ensuring that open science infrastructure is accessible for all, internationally interconnected and as interoperable as possible, and that it follows certain core specifications, notably the Findable, Accessible, Interoperable, and Reusable (FAIR) principles and the Collective Benefit, Authority to Control, Responsibility and Ethics (CARE) Principles for Indigenous Data Stewardship;
- d. optimising infrastructure use and joint strategies for shared, multinational, regional, and national open science platforms, including through the promotion of research collaborations, sharing of open science infrastructures, technical assistance, transfer and coproduction of technology related to open science, and exchange of good practices;

- e. investing in human resources, training, education, digital literacy, and capacity building for open science.

36. Promoting the inclusion of knowledge from traditionally marginalized scholars by:

- a. mainstreaming gender equality aspects into open sciences policies, strategies, and practices;
- b. require Indigenous leadership when developing policies applicable to the governance and stewardship of Indigenous data and traditional knowledge;
- c. developing participatory strategies for identifying the needs of marginalized communities and highlighting socially relevant issues to be incorporated into the science, technology, and innovation research agendas;
- d. strengthening diversity in editorial boards, peer reviewers, and advisory committees through inclusive selection processes and monitoring;
- e. developing policies to counter systemic bias in peer review, such as including transparent guidelines, open peer review, double-anonymous review options, and bias-awareness training;
- f. collecting and publishing disaggregated data (gender, geography, language, ethnicity, institutional affiliation) to monitor progress towards equity in publishing;
- g. creating targeted funding and mentorship programmes for scholars from underrepresented groups to support participation in global publishing.

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Related resources and useful links

- UNESCO Recommendation on Open Science. <https://unesdoc.unesco.org/ark:/48223/pf0000379949>
- Pact for the Future. <https://www.un.org/sites/un2.un.org/files/soft-pact-for-the-future-adopted.pdf>
- UNESCO Recommendation on Open Educational Resources. <https://unesdoc.unesco.org/ark:/48223/pf0000383205>
- Outcome Document of the 4th United Nations Open Science and Open Scholarship. <https://www.un.org/en/library/OS25/outcomes>
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