International Science Council

The global voice for science

Eight Fundamental Principles for Scientific Publishing

The International Science Council (ISC) - Future of Scientific Publishing Steering Group - has prepared these principles which have been endorsed by ISC Members through a resolution adopted at the 2021 ISC General Assembly.

1. **There should be universal open access to the record of science, both for authors and readers, with no barriers to participation, in particular those based on ability to pay, institutional privilege, language or geography**.

Excessive prices, far in excess of the necessary costs of production, place much of the record of science beyond the reach of many who would wish to access it, either as authors or readers. Many in low- and middle-income countries are excluded, resulting in a fractured international scientific community. Almost every major national agreement struck between the science systems of the global north and major commercial publishers sustains an inequitable barrier to access by those of the global south. Open access to readers only, based on excessive up-front article processing charges (APCs), is open in name only. True open access is access that is affordable to both readers and authors.

2: **Scientific publications should carry open licences that permit reuse and text and data mining**.

Too much of the record of science is inaccessible for reuse and the application of modern methods of knowledge discovery because of restrictive licences that sustain high paywalls. Some publishers seek to monopolize metadata in monetizing and controlling access to knowledge.

3: **Rigorous, timely and ongoing peer review must continue to play a key role in creating and maintaining the public record of science.**

Conventional peer review is foundering under pressure. It is often slow, ineffectual and inefficient. It is estimated that current peer review mechanisms represent a donation of at least US$ 2 billion per year, largely from academic researchers, to mainly commercial publishers [4]. Reforms are required to better respond to the needs of science and scientists, utilize the resources of scientific institutions and mobilize the potential of automated procedures.

4: **The data and observations on which a published truth claim is based should be concurrently accessible to scrutiny and supported by necessary metadata.**

It is a fundamental tenet of the scientific method that evidence supporting a published truth claim must be concurrently available for peer scrutiny. Data are in principle as important an output of science as text articles. They should be concurrently accessible under FAIR (Findable–Accessible–Interoperable–Reusable) principles, with securely managed routes to access where general access needs to be restricted because of considerations of safety, security or privacy. Failure to disclose evidence makes falsification so much more difficult, and burdens science with issues that proper disclosure would dispense with. It diminishes the power of science as a special form of knowledge.

5: **The record of science should be maintained in such a way as to ensure open access by future generations.**

With the demise of the physical 'library of record', it is vital to develop digital means of ensuring sustainable, enduring access to the global record of science and the means of identifying and accessing its content.

6: **Publication traditions and bibliodiversity of different disciplines and regions should be respected.**

Given the diversity of needs, of discipline or geography, no one size fits all. Efficient adaptation of publishing systems to different needs is a priority. The development of procedures to facilitate inter-operability between different disciplines of the scholarly record is under-developed, including procedures that could support multi-lingual communication.

7: **Publication systems should be designed to continually adapt to new opportunities for beneficial change rather than embedding inflexible systems that inhibit change.**

Outmoded forms of publication derived from the print and paper era dominate much current publishing. They should be replaced by more efficient and flexible forms that exploit the developing capacities of digital technologies.

8: **Governance of the processes of dissemination of scientific knowledge should be accountable to the scientific community.**

Access to scientific knowledge, and strategic knowledge about science is increasingly monopolized by major commercial publishers/technology companies whose principal responsibility is to their investors rather than to science.

Source: https://council.science/actionplan/why-scientific-publishing-matters/publishingprinciples/