

29 The Impact of Open Access on Global Challenges Research

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We have made incredible leaps of knowledge as humankind. Open research plays a decisive role in allowing us to fulfil the mission of advancing worldwide knowledge. Its core idea grounds its key advantage: democratization of knowledge. Research is freely available online for anyone in the whole world who wishes to access and share it in order to confront global challenges.

Specifically, open access publication makes research permanently accessible without restriction, which can grant benefits to all the stakeholders in the process: students, librarians, authors, business developers, funders, researchers, publishers, the general public, and society as a whole. The different stakeholders benefit from open research in different ways. For example, for students and libraries/archives, the benefits of avoiding the payment for individual articles, books or journal subscriptions are noticeable.

We cannot forget that the costs of publication are frequently the responsibility of the author, perhaps through their employer or a research grant. In times of funding cuts, these costs may hamper researchers who want to publish open access. But, depending on the journal, open publishing can have the same fees or less than traditional publishing.

As a senior researcher, I am fully aware of the pros of open research. Authors can take advantage of the unrestricted availability of their research to others, potentially leading to a rise in the prominence and usage of their work. In an era where the number of published documents is skyrocketing, the utilization of open access approaches can ease the discoverability of an article or result. Ultimately, a large amount of readers can be converted into citations for the author, mentions in media and social media, higher credits (e.g., references to data), extra funding (e.g., rewards, awards), reuse of datasets, prevention of duplicate works or improved networking (e.g., new job opportunities, promotion, tenure or better workload distribution).

Open research can often be utilized without the need to request additional authorization from publishers. For example, an article could be included in a presentation or a university course package, or even translated into a different language. Accordingly, it is possible to enable anyone to make derivative versions of an open access manuscript or outcome (note that this will depend upon the particular Creative Commons license applied).

Researchers can access scientific literature anywhere, even outside the university, without encountering paywalls or subscription options. In developing and low income countries, the non-access to journals is a common claim of the researchers. Global open research can trigger collective empowerment and equality, providing scientists in such countries with the chance to belong to an international research community. Today, some publications offer discounted or waived publication fees for papers coming from low-income countries.

Furthermore, the outcomes of research programs are becoming free to society, to ensure enhanced transparency of the use of public funding. For instance, many funding bodies like the European Commission have encouraged or mandated open research due to its potential for a greater return on investment. Open research for the whole of society promotes awareness among citizens, evidencing the outcomes of public funded research, and helps to build trust and endorsement for public policies. Besides, it encourages citizen engagement and active involvement in scientific experimentation, research trials and data collection (e.g., smart city crowdsourcing). As a result, open research means access for society at large and potentially greater public engagement with the significance of science and technology. Furthermore, open research can help workers outside academia (e.g., teachers, lawyers or even business developers) who rely on research, to profit from the retrieval of the latest key findings.

Besides, open access publications and open source tools (e.g., GitHub) are enablers to help researchers to undertake collaborative work on an international scale, increasing the ability to create research networks. For example, open access journals with interdisciplinary approaches can help researchers with a different background to connect more easily.

Whilst not an issue for reputable, renowned and trustworthy publishers, some people could argue that the utilization of open access models incentivize the publication of articles. Publishers have to face their operating costs, and their revenue business model comes largely from publication fees. Nevertheless, to ensure the sustainability of the system, publishers should be encouraged to publish articles that guarantee excellence in aspects like novelty, significance, quality of presentation or scientific soundness.

Wider access to scientific inputs and outputs can evolve the effectiveness and productivity of the research system, by lowering the costs of creating and transferring—multiplying opportunities for global involvement in the research process. Open access to scientific datasets and other outputs that assist the research process raises the opportunity for inspection by the scientific community,

thus allowing for more accurate validation, replication and improvement of the results. This examination enables self-correction principles, allowing for prompt identification of any misconduct, fraud or human errors, and therefore it is straightforward to detect or eliminate these practices for the benefit of scientific integrity.

Ubiquitous access to research outcomes can foster spillovers, not only to science, but also to knowledge and technology transfer in innovation systems, as well as increase conscious choices among citizens. Science plays a strategic role in the competitiveness of economies, and the higher efficiency associated to open research would benefit both advanced and developing economies. Furthermore, open research and innovation can reduce delays in the reuse of the results of research, and promote the shortest path from research to technology and knowledge transfer; and innovation to produce disruptive products and services.

The value of open research extends to the whole of society. Research is inevitably global and it must take advantage of it. It can foster innovation, create economic growth, endorse collaboration and speed up knowledge and technology transfer for a holistic comprehension of the societal challenges that require coordinated actions, such as war refugees and immigration, climate change, cancer, chronic diseases, supply chain traceability, transparency, corruption, inequality or the ageing population, and could help to uncover solutions more effectively. Finally, one motto for the researchers: Keep your rights, decide how your research work is used, face global challenges and advance society!



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