1 July 2021

International Science Council
The global voice for science

Statement from the International Science Council delegation to the UNESCO Special Committee meeting on Open Science, 6-12 May 2021

Open Science and the UNESCO initiative

Scientific inquiry has long been a self-organized enterprise. Governments, funders and universities may all, from time to time, have prescribed priorities for scientific inquiry, but scientists themselves have largely determined how inquiries should be conducted. In the process they have created and stewarded their own organizations: learned societies, academies, and centres within the generally flexible framework of their universities. Principles of self-organization have been sustained even as governments have increasingly recognized the value of science in promoting national agendas. Common implicit, and sometimes explicit, premisses have been that whilst governments may articulate their priorities and set research budgets, decisions on how resources are expended, and how research is organized are best left to researchers, and that giving scientists the freedom to follow their inspiration is the best way to maximize the return on society's investment in research. Thus, the social organization of the scientific effort in addressing increasingly complex, interdisciplinary problems or strategic research priorities has been largely left to researchers. This self-organization has developed in a way that maintains a creative tension between, on the one hand, competition for esteem and funding, and on the other hand, cooperation to achieve deeper more widely applicable understanding. It is a balance of drivers that has served the enterprise well, whether at the level of individuals, national science systems or international science collaborations, whilst also serving the interests of multiple stakeholders.

The ongoing digital revolution of recent decades has created a new basis for scientists to access, manipulate and communicate data, metadata, information, and preliminary knowledge, and to hypothesize, debate, reproduce, replicate, validate and refute. It has greatly facilitated globally networked research, efficient data-sharing, and immediate access to the record of science, including by automatic techniques of knowledge discovery, in principle by all, thereby enhancing the rate and dimensions of knowledge creation. Although Open Science is not new, it stems from the publication of the first scientific journals in the late seventeenth century, profound new digital opportunities have inspired scientific communities to progressively mature and crystallize the essentials of a new Open Science movement. It enlarges scientific and social horizons in the pursuit of knowledge, its dissemination and use. Intrinsic to this new paradigm are historic values of scientific self-organization, principles of freedom and responsibility, universal accessibility and sharing, inclusivity and equitability, together with responsibilities for education and capacity development, as reflected in the statutes of the International Science Council (ISC) and in its vision of "science as a global public good"[1]. The expanded social networks of this new openness are exemplified in trends of increased

[1] https://council.science/actionplan/isc-vision-and-mission/

multi-nationally authored scientific papers, the growth of transdisciplinary collaboration and of citizen science.

The shaping of this new paradigm has largely been achieved through the work of the national academies, international scientific unions and associations, and related bodies that are represented in the membership of the ISC, and reflected in its statement on Open Science[2]. National and regional funders of science have increasingly supported the Open Science imperative by investments in supportive infrastructures and promotion of open access publishing as a condition of funding.

Now UNESCO has taken a stance. It seeks to formalize these trends at an international level by placing a recommendation on Open Science before its 193 Member States for their endorsement[3]. It has engaged with the scientific community over the last year to generate a long list of draft recommendations for open access to the published record of science, open data, open educational resources, open-source software and code, open hardware and infrastructures, and open engagement with society. The draft's first contact with political reality, in the form of national representatives, took place in early May 2021. Representatives were almost universally supportive, and even added "bite" on some crucial issues. For example, there is an increasing awareness of the moves of some major commercial publishers to evolve into broadly based "science/knowledge platforms", able increasingly to monopolize not only access to scientific knowledge but also to data about science and scientists, their evaluation, scientometrics, management, networking, priorities and funding, with little accountability to the scientific community or its organizations[4]. Indeed, the commercial public sector has been more than effective in monetizing scholarly output, creating an oligopoly of control, and is learning how to take control over additional aspects of the research life cycle, now especially focused on the interaction between publishing, data repositories, and access to data. Awareness of these trends was reflected in a critical insertion in the text by UNESCO Member States that: "The monitoring of Open Science should be explicitly kept under public oversight, including the scientific community, and whenever possible supported by open non-proprietary and transparent infrastructures. This monitoring aspect could include but should not be delegated to the private sector."

The UNESCO recommendation and potential cascading interventions by Member States could develop along two divergent pathways. They could enhance governmental support for the scientific community, and the stakeholder ecosystem of which it is part, as they develop new policies, infrastructures and collaboration strategies that serve the Open Science paradigm as it has progressively evolved over the last two decades. Alternatively, Member States could disregard the tradition whereby the scientific community self-organizes to achieve its purposes, and come to specify, or even regulate, how it should be organized. We are strongly in favour of the former, and concerned about the potential of the latter, which could create a mode of Open Science that opens the door: "to capture of publicly funded research value by commercial platforms, yet more 'metrics' of productivity to 'incentivize' scholars to work harder and a focus on the system-wide progress of science, ignoring costs and benefits to individuals, whether scientists or non-scientists"[5]. Nonetheless, we welcome the draft UNESCO recommendation most strongly, with the comment that awareness of danger is the first step in averting it.

ISC Delegation to the UNESCO Special Committee meeting on Open Science, 6-12 May 2021:

---

[2] https://council.science/actionplan/open-science/
[3] https://en.unesco.org/science-sustainable-future/open-science/recommendation
[4] https://infrastructure.sparcopen.org/landscape-analysis
and https://council.science/wp-content/uploads/2020/06/2020-02-19-Opening-the-record-of-science.pdf
[5] https://spontaneousgenerations.library.utoronto.ca/index.php/SpontaneousGenerations/article/view/19664

1 July 2021

- Geoffrey Boulton, International Science Council (ISC)
- Christophe Cudennec, International Union of Geodesy and Geophysics (IUGG)
- David Castle, World Data System (WDS)
- Nada Chaya, Arab Council for the Social Sciences (ACSS)
- Nilay Dogulu, IUGG
- Janet Halliwell, on behalf of Canada's adhering members, National Research Council of Canada (NRC) and Social Sciences and Humanities Research Council (SSHRC)
- Frédéric Hélein, International Council for Industrial and Applied Mathematics (ICIAM)
- Pam Maras, International Union of Psychological Sciences (IUPsyS)
- Michaela Rossini, International Institute for Applied Systems Analysis (IIASA)
- Juan Armando Sanchez, Colombian Academy of Exact Physical and Natural Sciences
- Megha Sud, ISC
- Jens Vigen, International Union of Pure and Applied Physics (IUPAP)