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Three Strategic Pillars: Finnish University Libraries' Network Fuelling Open Science and Access to Research-Based Information

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Abstract

In the fast-developing landscape of open science, university libraries need to constantly keep up to date in order to provide expert services that meet the current and future needs of researchers, students, and anyone in need of research-based information. Joint actions are needed both nationally and internationally. The COVID-19 pandemic has shown that open science currently only gives partial access to research information. A significant part of the information resources are behind paywalls, and as library premises have been closed for the public walk-in access, the information resources have not been accessible to a wider audience.

The Finnish University Libraries' Network, FUN, acts as a collaborative forum for Finnish university library directors. FUN encourages university libraries to experiment with new modes of operation, to demonstrate impact, and to increase the visibility of the library operations.

In this paper, we explore how a network like FUN can promote open science and provide access to research-based information.

The strategy of FUN builds on three pillars: **Impact – Visibility – Experiment**.

These three pillars form our framework. We use multiple methods to describe the strategy and give examples of the practices, and also discuss the challenges faced in the new circumstances.

University libraries work towards open science together with other important stakeholders such as researchers, publishers and funding agencies. Still, there is a need to voice the concerns of the university libraries as their role differs from those of the other stakeholders.

Through its actions, FUN seeks to make the work of Finnish university libraries more ***visible*** both within the network and in the society, and thus increase the ***impact*** of the libraries in promoting open science and access to research information. Since during the COVID-19 pandemic access to information has been limited, FUN, together with other stakeholders, has taken action and sent a petition to Finnish scientific publishers to temporarily open their publications.

One of the three pillars in FUN's strategy is ***Experiment***. During the COVID-19 pandemic, of most importance for FUN has proved to be establishing a culture of sharing experiences with colleagues, so that every library can benefit from the endeavours of others.

Keywords: Open science; Information access; COVID-19; University libraries; Strategic collaboration

Introduction

The need for research-based information is greater than ever. The global situation with the post-Trump era and COVID-19 pandemic has challenged the openness of science and critical thinking as guides to a better future. The deliberate use of misinformation has grown rapidly, and it has been used to diminish democracy and open society. As Richard Ovenden, Bodley's Librarian, has pointed out, the role of libraries and archives in open societies is crucial; by preserving knowledge we can hinder the attacks on open society (Ovenden, 2019). The essential pathway to open science and research-based information are libraries (see for example Kaiponen & Saarti 2019). This is one of many routes to the playing field where university libraries in Finland are currently working.

University libraries have a long tradition of cooperation in Finland. With its 5.5 million population Finland has become a success story of education, and it now has 14 universities and university libraries. They are all represented in the Finnish University Libraries' Network, referred to later in this paper as FUN.

FUN acts as a collaborative forum for Finnish university library directors. It encourages university libraries to experiment with new modes of operation, to demonstrate impact and to increase the visibility of library operations. FUN works to predict changes in the operational environment from a strategic management perspective and to promote research and education in collaboration with the academic community. FUN's predecessor, the Council for Finnish University Libraries was established in 1996. In 2018, it changed its name to Finnish University Libraries' Network.

In our paper we discuss the role of Finnish university libraries as a network while we are transforming and developing our services to benefit our own organizations. At the same time, FUN creates a greater good for all members. We base our presentation on the three pillars of FUN's strategy: Impact – Visibility – Experiment. FUN can influence the development and direction of open science and research in Finland by participating in the various representative organs and working groups.

University libraries in Finland have a multifaceted and comprehensive view to open science and research-based information. Finland has six legal deposit libraries. They all collect books, periodicals, serial publications, sheet music and maps, and provide access to electronic legal deposit material, in this way preserving knowledge. Some Finnish university libraries have launched university presses to ensure full open access to research-based information. Furthermore, self-archiving (green OA) is of essential importance to the promotion of open science.

Finnish university libraries are a key provider of access to a variety of materials and especially journal databases, which guarantees the development of science and research. However, in recent years it has become clear that many of the publishers have in many cases raised the price of their packages by 5-15% per year, and this has created serious challenges to library budgets. The situation has become quite intolerable. Lately many Finnish University libraries have been forced to negotiate the agreements as individual organizations, as the FinELib consortium, which negotiates national agreements in Finland, has focused its resources on large-scale agreements with publishers.

Access to research-based information became critical worldwide when the COVID-19 pandemic ravaged the world last year. Open science and access to e-resources were of particular importance to

health-care professionals and researchers in university hospitals. This was also the case in Finland. From mid-March 2020 Finland was practically closed for a couple of months. For the first time libraries had to close their premises. For situations like this and to ensure access to the latest scientific articles Finnish university libraries have created alternative access plans. These include for example locating legal open access copies, ILL, and pay-per-article purchases. Some university libraries have created independent university presses to ensure immediate open access pathways to research.

Open science has been a rising trend from 2010 onwards, and in Finland a major step forward was taken in 2014, when the Finnish Ministry of Education and Culture launched its Open Science and Research Initiative. One of its aims is to examine the openness of research work, including data, publishing, and working culture. The scope has remained the same since 2014. In Finland open science coordination involves universities, polytechnics, research institutes, funding bodies, libraries and archives.

After the initiative period of 2014-2017, the Open Science and Data Action Programme was created under the guidance of Universities Finland in Spring 2018. Open science is currently funded by the Ministry of Education and Culture and developed in four focus areas under the Open Science National Coordination led by the Federation of Finnish Learned Societies. These areas are the culture of open scholarship, open data, open access and open education. The practical work is done via four expert panels based on the focus areas and their working groups. FUN has a representative in the Open Science and Research steering group.

Finnish university libraries play an important role in promoting open science in their organizations. In addition, we also work together on these matters as a network. This is evident when one thinks about the widening perspectives of libraries. We work together with research services and researchers in the fields of open access publishing, self-archiving and open materials, just to mention a few. Developing these services with an understanding of the post-digital era and e-science is essential (see Ala-Kyyny 2020).

In this paper we illustrate the key role of university libraries in Finland in providing access to research-based information and promoting open science in Finland through FUN's strategy, and describe some of the best practices that have been built on the three strategic pillars.

The pillars of FUN's strategy promote open science and access to information

FUN as a community is promoting open access in many ways. The individual libraries that together form the FUN network are in different phases in promoting open access but for all of them the three pillars of the FUN strategy are important: Impact, Experiment and Visibility.

In this chapter, we describe how these pillars in practice promote open science and access to research-based information.

1) Impact

Impact on advancing open science in practice

Academic libraries in Finland have been among the most active pioneers in advancing open science and open access to scientific information. The Finnish university libraries network (FUN) has not had a single meeting without discussions on OA issues for many years. During the past decade there has been a growing pressure to find national and international means to advance open science. In Finland the Ministry of Education and Culture assigned the Federation of Finnish Learned Societies to coordinate the Finnish academic community's progress towards open science in 2018.

The open science coordination is based on open science expert groups, whose membership is open to all experts within the Finnish scientific community with an interest in open science. It did not come as a surprise that most experts joining the open science expert groups were experts from academic libraries. The members of the National Open Science and Research Steering Group were nominated; membership was not open to all. The steering group consists of representation from university rectors (UNIFI, 4-5), rectors of universities of applied sciences (ARENE, 2), research institutions (3-4), Academy of Finland (1), researchers (2), university libraries (FUN, 1) and National Library (1). Later also CSC – Finnish IT Center for Science was invited to the steering group.

In recent years the National Open Science and Research Steering Group has been actively building strategies for Finland to open its science. It has sought statements to its different definitions of open science policies from the wide academic community and some policies have already been approved. FUN has been actively participating in this policymaking both in the open science steering group and by giving statements on the policies. The following open science and research policies have already been agreed upon and published:

- **Open access to scholarly publications**. National policy and executive plan by the research community in Finland for 2020–2025: Policy component for open access to journal and conference articles

- **Open research data and methods**. National policy and executive plan by the higher education and research community for 2021-2025. Policy component 1: Open access to research data

- **Open education and educational resources**. National policy and executive plan by the higher education and research community for 2021-2025. Policy component 1 – Open access to educational resources

The Finnish academic community also signed the Declaration for Open Science and Research 2020-2025. FUN had a lot of input into the writing of the declaration. Many of the ideas provided by FUN and other academic institutions were incorporated into the declaration.

FUN has examined APC costs and the number of publications self-archived by university libraries in recent years. FUN has raised the concern of rising OA costs and recommended the strengthening of green OA via legislation. FUN has also brought up the different levels of open access awareness in different disciplines in the OA discussions.

Green OA in Finnish universities is usually organized by their university libraries. 72 % of the scientific publications of Finnish universities were open access in 2020. The change has been rapid, since in 2016 only 36% of the universities' scientific publications were published open access.

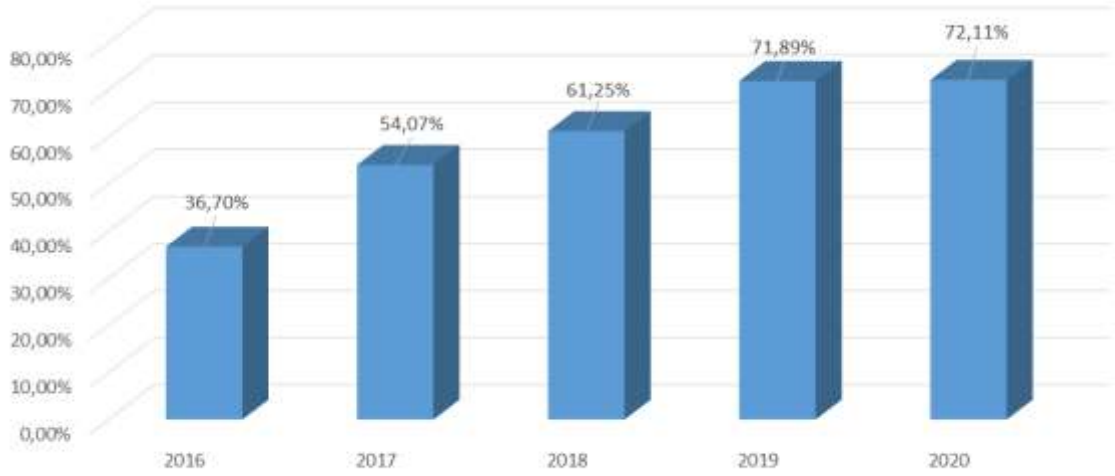

Figure 1. Scientific publications, Finnish universities 2016-2020, OA total %

In recent years, green OA has strongly dominated the increase of open access in Finnish academic publishing. Just lately the Plan S aligned transformative agreements with big publishers, gold OA, have been increasing rapidly. However, green OA is still needed to foster the change to completely open access to scientific information.

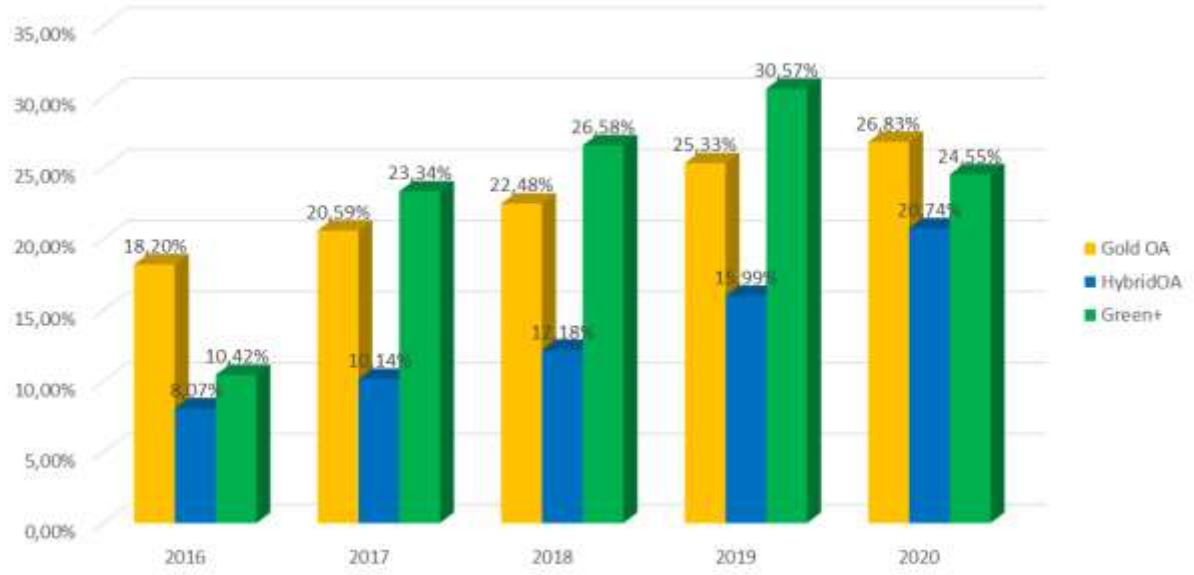

Figure 2. Structure of openness, scientific publications, Finnish universities 2016-2020

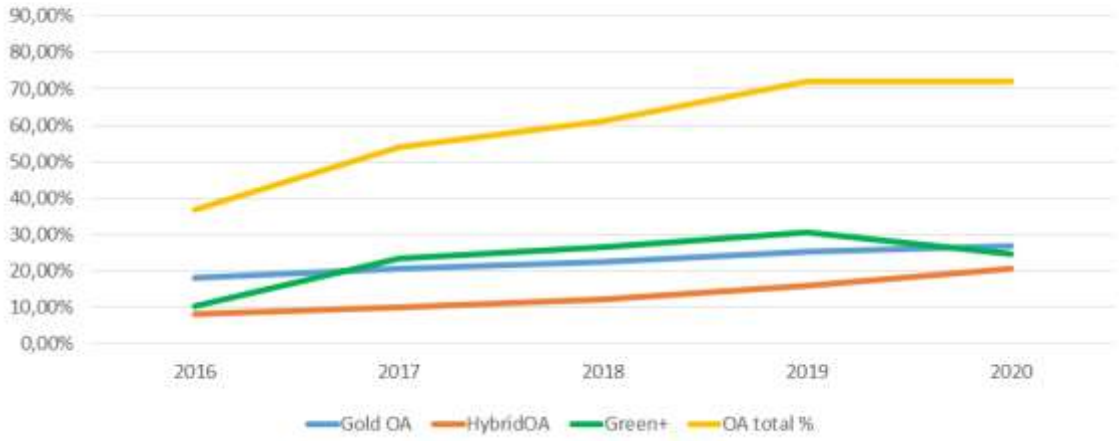

Figure 3. Scientific publications, Finnish universities 2016-2020, OA types %

Impact on the regulation concerning open science

Although open science has become a significant movement there are still several challenges ahead. Many of them are related to legal issues. Restrictions on data mining by agreements and the absence of a self-archiving exception in the national legislation have been reported among the major obstacles to fully implementing open science in Finland (Forsström, Lilja & Ala-Mantila 2019).

In the Reform of the Copyright Act – the national implementation of the directive on copyright and related rights in the internal market (DSM directive, (EU) 2019/790) both obstacles can be removed. To influence the national regulation FUN, together with the Finnish Research Library Association (STKS), has sent a statement to the Ministry of Education and Culture concerning the DSM directive implementation.

In the statement FUN and STKS expressed their support to the data mining and cultural heritage objectives put forward by a legal group representing museums, libraries, and archives. We also wanted to emphasize the need to modify copyright law to include an exemption for self-archiving.

Open access to publicly-funded scholarly publications has been set as a goal in both the EU and Finland. Although progress has been made, some obstacles still remain. In 2017, The Ministry of Education and Culture published a study (Mansala 2017) on the need for legislative change to promote an exemption for self-archiving.

There are examples of similar European legislation, e.g. in the Netherlands, Germany, and France. Open and free access to scientific publications is already required by most international and national research funders. One of the most significant openings has been the European Research Funders´ Plan S, which aims at immediate open access publishing. We have seen different publisher contract models on open access publishing evolve. The new models have brought flexibility, but at the same time they have also made the negotiations more arduous and complicated the publishing process. There is a risk that if self-archiving is not supported, the ever-rising costs will shift from acquiring licenses to journals behind a paywall to paying publishing and reading fees to various publishers to open their publications.

By promoting open science initiatives, Finland is part of international Open Science and research programmes, such as Horizon Europe, which seeks to maximize access to information and data. The contradictions in regulatory and contractual practices do not help to achieve this objective.

Appeal together with university rectors and students

In the spring of 2020 Finnish universities suspended all teaching on campus following the government's guidelines in the COVID-19 situation, and moved extensively to distance education on a fast schedule. Under these exceptional circumstances, there was no access to all necessary information resources and therefore rapid measures were needed to extend licenses to cover off-campus access as well.

FUN, together with Universities Finland (Unifi) and the National Union of University Students in Finland (SYL), published a petition in which they appealed to Finnish scholarly publishers, vendors, and all those who have the power of influence to enable access to digital information resources, to meet the needs of university distance education, research and study for the duration of the state of emergency declared by the government.

We saw examples of international scholarly publishers and other actors showing understanding and support for the situation in universities by expanding their licenses and access to their information resources during the COVID-19 pandemic. It was time for Finnish science publishers and intermediaries to take action.

The appeal provoked a vivid discussion. Some publishers temporarily opened access to their digital course materials. Some of the Finnish scholarly publishers and societies responded to us and explained their difficulties in opening their journals or monographs.

Influencing the development of the National Repository Library

The National Repository Library (later referred to as NRL), located in Kuopio, is a unique national service for all library sectors, functioning under the Ministry of Education and Culture. NRL reduces the collection space needed for libraries and ensures that the material taken into the collection is available to users in a cost-effective manner. NRL was founded in 1989, at a time when university libraries needed more space for their expanding collections every year. As universities were at that time directly funded by the Ministry, there was an interest in finding a cost-effective solution. Accordingly, during the past

decades, university libraries have donated significant collections to NRL, being assured that these collections will be accessible to users in the future. The current collections of the NRL exceed 100 shelf kilometres.

In 2019, the Ministry reopened plans to move NRL to another city and to change its independent status. In a statement to the Ministry, FUN took action and expressed its worries about the consequences of the planned changes and appealed to keep NRL as an independent institution. We considered it unthinkable for one university to gain ownership of materials donated to the state by other universities. At the national level, Finland must have a functioning repository library that preserves the national information resource reserve. As universities scale down their facilities, their libraries are forced to prune their collections and remove little-used material.

We received no direct reply to our statement, but the Ministry reported in 2020 that NRL will continue to operate as an independent institution. This decision also safeguards our resource sharing cooperation in the future.

2) Visibility

Visibility helps promote the goals of FUN's activities. Visibility can be seen as a way to achieve impact. When you are seen, you will be noticed and your message will be heard. FUN is currently represented in 30 national and some international organs related to its field and is thus influencing development in the field of university libraries and open science. In addition, FUN actively organizes regular meetings with key stakeholders to ensure mutual and continuing communication.

25th anniversary webinars

The FUN strategy pillars were chosen as themes for FUN's 25th anniversary year events. Founded in 1996, year 2021 is a milestone for FUN. Among the events celebrating the 25th anniversary, the most important ones are the three jubilee webinars. The jubilee webinar series gives visibility to FUN and promotes open access. They are intended for Finnish library staff in academic and public libraries and also for library students.

The webinar *FUN Impact* was arranged in March 2021. The first webinar aimed to give three various angles on the impact of academic libraries: international, national and local perspective.

The international perspective was based on research on the topic, done already in 2017 but supplemented with the results of a newer study. The areas related to the effectiveness of libraries were service, learning support, collaboration and communication. The national perspective was surveyed via the experiences and activities of FUN in recent years. FUN has been quite active in promoting impact in academic libraries by e.g. developing OS services, influencing stakeholders, working towards open communication within FUN and benefiting from its own networks.

The local perspective came from one Finnish academic library with its extensive and groundbreaking activities in the field. The impact of the library can be improved by cooperating with many stakeholders. The involvement of different groups in the planning of library operations and facilities is also becoming increasingly important.

After all the presentations it became obvious that the future of the libraries will depend on how they succeed in helping the universities to achieve their strategic goals.

The webinar *FUN Experiment* was arranged in May 2021. The purpose of this event was to hear about new developments in academic libraries, with the emphasis on international development.

New developments in the Netherlands and Denmark were described. It is very interesting to follow the Future Libraries Lab project, which unites all stakeholders: customers, librarians, new technologies, and examines the new developments arising from this. Citizen science and how it has developed in Denmark was also surveyed. It is part of open science and will have a significant impact on the role of libraries in the future. A Finnish view on open access came from the Jyväskylä Open Science Centre.

Two main themes for the future are apparent in all the presentations: experimental way of working in the libraries and intercommunication with the outside world.

Both webinars were very popular. No feedback questionnaire was sent but the individual comments have been positive. The presentations can still be read on the FUN website.

FUN Visibility will be the last webinar in November 2021. If the COVID-19 situation allows, it will be arranged in the form of a seminar with physical presence. Stakeholders are especially important for FUN visibility so the webinar/seminar will include presentations by FUN´s stakeholders in science, research and universities, directing towards the future.

FUN is encouraging Finnish university libraries to increase the visibility of their work both within the network and in the wider society. This has been put into practice in the layout of the new strategy and on the FUN website.

3) Experiment

A robust way of developing new services is experimenting and conducting pilot studies. When the results are shared in the FUN network, even small-scale studies can be of use to the development of services in other university libraries.

Åbo Akademi FAIR laboratory notebook pilot study

At Åbo Akademi University (ÅAU), pilot studies are important for developing open science support services to researchers. The assumption is that small collaborative steps can have lasting effects on the openness of science, if taken with careful consideration both of the research context and of subject-specific needs. An example of this is the *FAIR laboratory notebook pilot study*, which aimed at making laboratory notebooks digitally available and shared. Laboratory notebooks are crucial for the reproducibility and validation of the research process, which means that their digitalization is a necessary step towards openness in the scientific workflow.

In order to lower the threshold for participation, the study utilized generic tools already in use at ÅAU instead of dedicated ELNs (electronic laboratory notebooks). Twelve researchers participated in the pilot study and they used, on their own, OneNote with Teams and Sharepoint/Microsoft 365. A Teams channel was established for peer support and for assistance from the library.

The pilot study yielded many gratifying results. The participants discovered new opportunities for collaboration in using their shared laboratory notebooks, e.g. with their students. They learned new approaches to access and storage when discussing the practical questions of who should have access to what and where to store the notebooks. The study also gave rise to a new work practice, as the participants realized that they could make use of their mobile phones and upload photos or speech directly into the laboratory notebooks. Another advantage over paper notebooks was that a digital notebook may contain diagrams and other elements ready for publication, i.e. the step between preparatory work and publishing became smaller. Moreover, the study identified problems that need to be solved before adopting digital laboratory notebooks on a wider scale. Archiving in the Sharepoint environment is not trouble-free, and the questions that also have to be addressed are what happens to notebooks if their owners leave the organization, as well as how to extract proofs of discovery for patents.

The pilot study was a mutual learning process. The participants became familiar with the basic concepts of open science, such as sustainable archiving, and the library gained new insights into the researchers' work in the laboratory and received valuable information for developing services for all phases of the research process.

There are various ways of sharing information in the FUN network. Meetings and webinars are good options for presenting studies, whereas the email list for library directors is an excellent way to share links to published materials. There is also an online collaborative workspace where the network's documents are stored. However, although there are many channels for collaboration, it is not easy to ingrain a true culture of sharing in a network. There will always be room for improvement.

Weekly Zoom discussions during the COVID-19 pandemic to share experiences

In the spring of 2020, when the pandemic had forced universities into distance education, libraries tried to implement, in any possible way allowed by the authorities, lending services as a pick-up service.

The situation was new to all of us. Local circumstances had to be considered and we did not want to risk anybody's health. Students urgently needed course materials for their exams and theses, and researchers and the general public needed access to collections as well.

University libraries' creativity and problem-solving skills, along with agile practices, were needed to quickly change the operational practices and inform the library users accordingly. Evenings and weekends were spent designing new models of operation in the changed circumstances.

Therefore we almost immediately launched new types of weekly peer-to-peer sessions with Zoom to share experiences and freshly developed practices. These turned out to be indispensable. The benefit of having an existing network and ready structure for the immediate sharing of experiences during the crisis, was greatly appreciated in the FUN network. The practices that the university libraries had tried out were astonishingly innovative and showed how committed the libraries were in their mission.

We shared the grey everyday life, not just big innovations! In the future, projects with iterative processes and learning from experiences will become more important, and we should further develop a culture of experimentation.

Conclusion

After celebrating FUN's 25th anniversary, we look forward to the next 25 years with an open mind, constantly experimenting and developing new innovative services together with customers and other stakeholders.

The strategic core goal of FUN's operations will continue to be to working together as a network to uphold reliable research-based information, which is the most valuable asset in the era of misinformation and disinformation. Open science provides a pathway to democratizing knowledge and making science accessible to all, which will accelerate finding solutions to complex global problems, including possible new pandemics.

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