

ALLEA – GYA – STM Workshop: The future of peer review in scholarly communications

Background and Introduction

In November 2020, ALLEA (All European Academies), GYA (The Global Young Academy) and STM (International Association of Scientific, Technical and Medical Publishers) convened two half-day discussion workshops about *'the Future of Peer Review in scholarly communications'* with a mix of invited representatives from the research community, research funders, universities, publishers, libraries, Open Science champions and trade bodies. The workshops were held under the Chatham House Rule to encourage open discussion and participants were reminded that they had been invited in a personal capacity and not as representatives of their organizations.

The goal of the workshops was to bring together a wide variety of opinions and perspectives about the value, hurdles, unknowns, challenges and advantages that accompany peer review in a world that is rapidly and radically changing.

This short report is intended to summarize the main themes that emerged during the discussions, and identify areas that can represent a path forward to further work.

Main themes and areas for further consideration

1. Clarifying peer review and the roles of different actors in the system

Peer review is an integral part of the research process and needs to be effective, efficient, and sustainable. Nonetheless, this process is not set in stone and has evolved over time to respond to today's and tomorrow's societal, research and technological challenges and opportunities. With the development towards Open Science and the advent of more complex and increasingly diversified research and publication processes, an improved and more holistic understanding of peer review is needed.

While there are multiple frameworks which depend on geographies, disciplines and audiences, ensuring quality and trustworthiness of peer review is of paramount importance. In addition, more clarity and transparency as to the roles, contributions, expectations and motivations of the different players - authors, editors, reviewers and publishers - of the publication process has to be ensured. To this end, separate and distinct meanings of 1) publication, 2) peer review and 3) incentives should be explored and clarified. We need to be more explicit as to what aspects of a research output have been peer-reviewed, by whom, for whom, and to whose benefit. The lack of a clear definition also leads to a misguided public perception of peer review with potential unintended and negative consequences. Peer review is not a certificate of absolute accuracy or truth. Clarification of the scientific process for users and the wider public is needed and openness and transparency can assist this. In the increasingly important areas of science for policy and citizen science, a more nuanced public understanding of peer review seems essential.

2. Building capacity for peer review: training, mentoring, inclusion and diversity

Anecdotally there is already a capacity challenge for peer review as the volume of research outputs continues to grow faster than the pool of trusted and experienced peer reviewers. This is compounded by the fact that as traditionally practiced, peer review is invisible and under-valued work done on a voluntary basis. There is a strong case for recognizing peer review as an essential part of the career development of researchers, which thereby requires professional appropriate training and mentoring. Processes also need to be discovered and introduced to increase the visibility of peer review and to increase its value as a community service which can be recognized in research assessments.

Whilst exploring good practices, it has to be acknowledged that peer review systems differ across geographies, cultures and disciplines and it is not entirely clear to what extent good practice might be transferrable. However, the known biases – of geography, of gender, of language, and of age – are largely universal problems where the exchange of experience and best practices would be highly beneficial. Encompassing a diversity of perspectives in peer review, by valuing inclusion and diversity in selecting peer reviewers, would likely make published knowledge robust. This is especially true when evaluating new genres of research outputs – as it is the expertise of early-career researchers who are often the ones driving these innovations, and they are therefore an important resource.

3. Leveraging technology to deliver enhanced peer review

The vast scale of the research enterprise and data sets, tangible progresses in technologies and communication tools, and novel interoperable data frameworks, integrated disciplines and research products/ expectations impose that we concentrate our efforts to robustly leverage technology to advance and improve peer review.

There are important advantages associated with new technologies capable of enabling recognition and accreditation, while harmonizing standards and maximizing the quality and efficiency of the peer review process (e.g., using metadata to characterize both the peer review type and stage). Enhanced transparency, reviewer accountability, and peer review analysis could increase the likelihood of effective peer review as well as bolster researcher and public confidence in the peer review process. Artificial Intelligence could also be useful for certain reviewing tasks, especially for checking technical requirements and analyzing large amounts of data. Still, concerns around data control and monopolization, penalization of different cultures and sectors/regions less resourced, and possible negative effects of opening reviewer identities to authors require careful consideration.

The research community must be involved and play an instrumental role in shaping a framework that responds to the growing need for innovative tools to support Open Data and Open Science. This process has to be driven by increased diversity and inclusion.

4. Changes should be motivated by a strong evidence-base, collected through research, pilots and experimentation

Many participants noted that there was a paucity of objective evidence about the impact and effectiveness of various forms of peer review. The advent of Open Science and new technologies calls for developing, supporting and experimenting with new models of peer review. Such changes should be evidence-based and this evidence needs to be gathered through pilots, surveys and experimentation. This will also connect researchers with other stakeholders, facilitating cooperation

to verify what models actually work and building legitimacy for these. An important corollary is that research assessment systems need to be designed so as not to discourage researchers from participating in such pilots and experimental publication systems.

Conclusions

Encouraged by the consensus that seems to be emerging in these areas, the three organizers are open to proposals for how best to continue the work of improving peer review in our new digital and open world of scholarship and science. The momentum built by the Open Science movement and the range of ongoing projects, mean that we are not starting from scratch. However, this work is still in an early stage and there is a need for a more integrated approach that brings together a wider diversity of viewpoints and stakeholders.

About ALLEA:

ALLEA is the European Federation of Academies of Sciences and Humanities, representing more than 50 academies from over 40 EU and non-EU countries. Since its foundation in 1994, ALLEA speaks out on behalf of its members on the European and international stages, promotes science as a global public good, and facilitates scientific collaboration across borders and disciplines. Jointly with its members, ALLEA seeks to improve the conditions for research, to provide the best independent and interdisciplinary science advice available, and to strengthen the role of science in society. In doing so, ALLEA channels the expertise of European academies for the benefit of the research community, decision-makers and the public. ALLEA is constituted as a non-for-profit association and remains fully independent from political, religious, commercial or ideological interests.

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About GYA:

The vision of the GYA is science for all; science for the future, and its mission is to give a voice to young scientists and researchers around the world. The GYA, founded in 2010, is an independent science academy of 200 outstanding early- to mid-career researchers from six continents who are selected from across disciplines based on their academic excellence and commitment to engage with society. GYA members serve five-year terms, and the GYA presently counts members and alumni from 86 countries. The GYA administrative Office is publicly funded and hosted at the German National Academy of Sciences Leopoldina. The wide array of GYA activities are supported by a range of international public and private funders.

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About STM:

At STM we support our members in their mission to advance research worldwide. Our over 140 members based in over 20 countries around the world collectively publish 66% of all journal articles and tens of thousands of monographs and reference works. As academic and professional publishers, learned societies, university presses, start-ups and established players we work together to serve society by developing standards and technology to ensure research is of high quality, trustworthy and easy to access. We promote the contribution that publishers make to innovation, openness and the sharing of knowledge and embrace change to support the growth and sustainability of the research ecosystem. As a common good, we provide data and analysis for all involved in the global activity of research

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