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100% AI-Reviewed Preprints are the Future of Open Research

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ABSTRACT

Preprints are very useful to communicate new research quickly by posting them on preprint servers. Not being peer reviewed remains the weakest point of this mode of research communication. Building on the recent developments, this article shows that the acceptance of preprints is growing, especially among the journal publishers, governments and research funders. Although there are several emerging models of preprint peer review, these suffers from challenges, such as an absence of proper validation. The conventional peer-reviewed journals also have structural limitations to take the open research forward. Their peer-review system and financial models, like Article Processing Charges (APCs), are exploitative, flawed and unjust. The use of AI in the journal peer-review system is advancing very fast. This article portrays a future scholarly world where 100% AI-reviewed preprints are the main channel of research communication. Drawing on examples from academia around the world, it further argues that to advance such a new model of open research, building a sense of community among all stakeholders is crucial.

KEYWORDS

Equity, open access, preprints, scholarly publishing

INTRODUCTION

The scholarly world shows a love-hate relationship with preprints. Its conflicting emotions of course vary with disciplines, organisations (i.e., research institutes, funders, publishers and scholarly NGOs) and even individuals in question. I do understand why we should be cautious about preprints. Despite being academic research outputs, preprints don't undergo a thorough quality check, such as peer review. As a result, these documents don't carry any hallmark recommended by 'solemn selfless sages'-whom we often casually call 'peer reviewers'-who could have guaranteed preprints' strength, genuineness, soundness and integrity. Some scholarly gurus even go extra kilometre saying that preprints are no better than predatory or questionable journals and papermills and essentially serve anti-science campaigns[1] (I don't know about you, but to be honest, I find such a view extra harsh). Despite all criticisms, we did see the second wave of preprint servers during 2016-2019[2], when the yearly growth rate of preprints was 10 times more than that of the journal articles[3]. This was quickly followed by a surge of preprints posted during the COVID-19 Pandemic[4]. As of December 2025, 65 preprint servers[5] are housing millions of preprints underscoring the importance of preprints in the on-going open research movement.

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This article argues that the future of academic research communication lies in preprints. The discussion is structured around the growing acceptance of preprints, emerging models of preprint peer review, structural limitations of traditional peer-reviewed journals, the role of AI-based review systems and the need to foster scholarly communities to advance a new model of open research.

ACCEPTANCE OF PREPRINTS 'IS' GROWING

One way to measure the acceptance of preprints is its growth rate. In the above section sub-heading, I've intentionally emphasised on the word 'is', since I couldn't find latest academic journals or other references on overall preprint growth. For individual preprint servers, the arXiv's annual report 2024 reports a 3.35 times growth between 2011 and 2024[6]. Of course, a recent study has shown a sharp decline of preprint use by the media after the COVID-19 Pandemic, apparently given the risk associated with premature exposure of important research via the preprints[7]. But preprint's acceptance is more than just counting numbers.

Preprints have changed the norms and practices in our science communication in several ways. It is no longer unethical, for example, to upload an unpublished manuscript on preprint servers for the world to read and at the same time submit the identical document to a journal for double-anonymous peer review. Many publishers now encourage authors to submit manuscripts to their journals, which is already available on preprint servers[8]. Even publishers, such as IOP Publishing[9], which strongly practice double-anonymous peer review, do the same. They, however, ask their reviewers *".... to undertake an objective review of an article and when agreeing to a double-anonymous review we trust that they will not go out of their way to undermine author anonymity"*. Interestingly, a manuscript could therefore be dissected on two platforms at the same time: Very openly on a preprint server and very secretly through a journal-managed peer-review process[10]. When the world publishes one research in every six seconds[11], such an intense attention to a manuscript is indeed quite suffocating.

Another fascinating aspect of preprints' acceptance is that peer-reviewed journals are absolutely fine with their authors citing preprints in the manuscripts they submit and publishers' preprint policy even encourage such citations[8]. It is a great irony that, despite being not peer-reviewed (the biggest criticism of preprints), preprints are continuously creating the foundation of peer-reviewed journal articles[12].

Speaking more of policies, the open access (OA) policies of different global entities is a good place to track the acceptance of preprints on a wider scale. Research funders, such as Wellcome Trust[13] and the Gates Foundation[14], strongly encourage preprint posting, especially for significant research, as part of their OA policies. Among the governments, in August 2022, the US Government issued a memo on 'Ensuring Free, Immediate and Equitable Access to Federally Funded Research'[15], which doesn't cover preprints. Nevertheless, through the Open Research Europe, the European Union promotes the posting of the preprints of research produced under the Horizon 2020 funding[16]. The year 2025 ends with the UK's Foreign, Commonwealth and Development Office (FCDO) publishing its OA policy on 8 December[17]. The FCDO not only encourages the preprint posting, but also indicates the possibility of making such uploading mandatory for important public health, humanitarian, environmental and livelihoods research.

PEER-REVIEWED PREPRINTS DO EXIST, BUT SUFFER FROM CHALLENGES

Preprints are supposed to be submitted to journals and get published after the due peer-review process. But, studies showed that 30%[18] to 38.4%[19] of preprints on the bioRxiv remained unpublished. This percentage is much higher for medRxiv (62.7%)[19]. Nevertheless, while community-led or crowd peer review has always been a part of preprint philosophy, that has reached to a new height lately. The ASAPbio developed a toolkit to guide a crowd-run preprint review system[20]. PREreview (prereview.org), on the other hand, aims at creating a community to join in preprint review through capacity building and networking. But, when we are struggling to get reviewers for journals[21] despite many non-monetary incentives, how

could we expect to get sufficient reviewers for the so-called unrecognised preprints? Also, studies showed that only a small fraction of preprints receives comments[22]. Usefulness of such comments (with a median length of 43 words) can also be questioned.

To integrate peer review within preprint system, different models have been proposed and tried. For example, eLife publishes preprints on their website as 'reviewed preprints'[23]. They have moved away from traditional binary accept/reject and publish both the public peer reviews and quality editorial assessments of the preprints[24]. In this case, the decision of 'publishing' these preprints is essentially curation, which gives these preprints an additional recognition. But these peer-reviewed preprints are not "validated" per se, like the peer-reviewed journal articles, as Bourguet and Guillemaud pointed out[24]. According to them, this critical weakness of the system could be overcome in two ways. First, a journal can publish a peer-reviewed preprint based on the peer reviews done through another service (e.g., as Review Commons-associated journals would do). Here, the editorial decision to publish will act as validation during curation of the reviewed preprint. The second option is the peer review of preprints will lead to validation by being accepted by the editor. Here, curation to include preprints in a journal (e.g. as done by F1000) gives it an additional value. Of course, innovative attempt around peer-reviewed preprints, like that of eLife, is not out of controversies[25].

INHERENTLY FLAWED PEER-REVIEWED JOURNALS CAN'T LEAD OA MOVEMENT

Over the last couple of decades, OA journals are promoted as a means of open research and partially contributing to open science. I would like to touch upon two aspects of OA journals separating them from preprints: i) Peer review and ii) Article processing charges (APCs).

The peer-review system we now see in journals is over-rated[21], full of flaws[26] and maintains perpetual injustice[12]. Besides the delays it causes to get a piece of research out, there are many fundamental challenges. As I have described elsewhere, peer review has lost its human face and has become a compassionless compliance issue[21]. Even those, which are identified as good practices in peer review are not without weaknesses[27]. Let me share three of them.

- Peer review is just like rolling a dice. You don't know who is going to review and what they would recommend[12]. That's why, despite being rejected by the peer reviewers of one journal, a manuscript with the same flaws could be published by another journal. Apparently, every manuscript has a journal waiting for it
- We glorify peer reviewers as the 'Guardians of the Scholarly Galaxy' (sorry for being too much influenced by the superhero movie trilogy of Marvel Studios)[21]. But peer reviewers don't take the responsibility of the dark-side of publishing-when published papers get retracted, everyone involved is blamed, except the reviewers
- Peer review system is highly exploitative. Subscription, hybrid and OA journals are capitalising on reviewers' free labour, more than 130 million hours per year to be specific[28]. Moreover, publishers are now making the exploitation trans-generational, by introducing a new practice called 'co-review', where an invited reviewer can bring in others, often young researchers, to review the same manuscript in a collaborative manner[27]

The Gold OA journals charge their authors APCs, which are full of anomalies too.

- The APCs lack transparency[12]. Imagine a hotel where you get a room for US$ 200 as well as for US$ 12,000. Despite carrying the same hotel brand, do you believe these two types of rooms receive same type and amounts of investments to maintain hygiene, safety, security, services and amenity? If your answer is 'no', then what is the 'price', not value, of that brand? If the answer is 'yes', what a bizarre business model we are taking about! This is what is happening with our Gold OA journal publishing

- OA journals, which have adopted Research4Life's framework, waive APCs or offer APC discounts to the countries identified as the Low- and Middle-Income Countries (LMICs)[29]. This is indeed a fantastic initiative to reduce inequity between economies and increase the geographical inclusion in scholarly publishing. But, costs do incur to publish such articles from the LMICs. We don't know how OA journals calculate their APCs to run their operations and manage profit margins. But, it is safe to assume that their APC estimations also include the above waived/discounted figures. It means that APC payers of these journals have to bear the burden of additional costs, because if the waivers/discounts were not imposed, the actual standard APCs would have been lower. (If my assumption is wrong, I urge OA journals to publicly disclose the real situation). Therefore, in the name of equity, we are maintaining another layer of injustice to the authors from the richer countries
- There are other dark-sides around the APCs. Southern researchers sometimes come together to raise APCs in exchange of becoming coauthors. So, to pay an APC of US$ 2000, five authors can come together and pay on average US$ 400 per author. So, instead of paying US$ 2000 alone and becoming an author of one article, one can pay the same amount to be author of five articles, with the possibility of being the first author of at least one paper. There are also instances where leading Southern research institutes included coauthors from the North with APC funding

AI-BASED REVIEW IS NOT A MYTH

Over the last three years, lots of discussions have taken place on AI (Artificial Intelligence) in peer review. The theme of Peer Review Week 2025 was 'Rethinking Peer Review in the AI Era'. While almost all advocates and enthusiasts of peer review are looking for a balance between the roles of human and AI in peer-review process[30], I take a different stand. I am in favour of 100% AI-dependent review system. Around the Peer Review Week 2023, I proposed a five-phase evolution from 100% human-dependent to 100% AI-dependent review system[31]. Exactly one year later, a blog on *The Scholarly Kitchen* indicated that we were already in the Phase 4[32]! The current developments indicate that AI can act efficiently as supporting tool in peer review, but yet to be ready to replace human peer reviewers[33]. Nevertheless, we are fast approaching towards a 100% AI-dependent review system[34] and we shouldn't be surprised if by the next Peer Review Week in September 2026, we see some reputed journals moved to a 100% Generative (Gen) AI-based review system[35].

Let me briefly describe the AI-reviewed preprint system I am advocating for. Given the inbuilt flaws of human-dependent peer-review system, we cannot have crowd, community or open peer review done by humans. Instead, we need a model where authors will 'post' a 'manuscript' on a preprint server. After an initial screening by AI for overall completeness, authorship authenticity, plagiarism, papermill, structural organisation, language, etc., it will be posted on the servers as a 'preprint'. This will be a sign that the research article meets the basic criteria to be in the public domain.

Gen-AI will then review the preprint against a set of criteria as we often ask human reviewers to check. These criteria may include looking into some core aspects, such as completeness of individual sections (e.g., abstract followed IMRAD style and methodology is sufficiently described), coherence among sections (e.g., results and discussion fulfilled research objectives and answered all research questions), structural flow (e.g., discussion matches results) and certain sections make sense (e.g. recommendations and conclusion). And, this checking should be done within an hour or so. Authors will respond to those observations and submit a 'revised preprint'. A human curator of the preprint server will make a decision on upgrading the status of a revised preprint based on the AI-reviewer's comments and the revised preprint and author's response. If all is OK, the status of the 'posted' preprint will be updated to 'published' and we may now call it a 'print'!

But, to bring together two contentious elements of scholarly communications, i.e. preprints and 100% AI-based review and create a new system, we need community support. I elaborate it in the next part of this article.

INNOVATIONS IN SCHOLARLY COMMUNICATION ONLY SURVIVE THROUGH A SENSE OF COMMUNITY

The scholarly publishing has been sustaining through community-wide agreements. Some agreements are as universal as they can get, such as that on the importance of peer review or journal indexing, which the scholarly world as a community tries to comply, although in diverse ways. Here communities themselves are very diverse in size, shape, volume and weight. Despite the relentless debates on 'the Good, the Bad and the Ugly' journals (sorry for my obvious weakness to the 1966's spaghetti Western movie with the same title), all journals survive, because there is a 'community' waiting to be served by them. The faculties of a university or of a whole country could create a community too. When universities of Bangladesh offer reward to faculties for publishing only in Scopus-indexed journals, or exempt faculty members from teaching one course if they publish an article in a Q1 journal, they create their own communities, respectively. Some related attempts by institutions are quite revolutionary. Since 2022, for example, the Utrecht University in the Netherlands stopped assessing their faculties based on individual-linked matrices, like the journal impact factor, rather based on their overall contributions to open science[36], through the Recognition and Rewards system[37]. Institutions also sign transformative, transformational[38] or read and publish agreements with academic publishers, which allow their researchers to read and publish OA articles unlimitedly within the agreed package. In many cases, a group of institutions create a consortium (a community) to be a partner of such an agreement which often makes it a nation-wide initiative[39]. In 2018, the University Grants Commission of India started maintaining a list of journals (i.e., the Consortium for Research and Academic Ethics (CARE) list) only where papers could be published by Indian academic institutions. Through this, all scientists of India as a community were put behind a protective shield against the predatory journals. This system was however abandoned in February 2025[40]. Disciplines can create communities too. Preprint system originated in 1991 has sustained for 35 years because physicists and mathematicians[10] appreciate its value.

So, we need a 'community' who accepts AI-reviewed preprints as the main form of scholarly communication.

Now the question is, if institutions will accept AI-reviewed preprints as scholarly outputs and include these in their recruitment, promotion and tenure criteria. Both the Global North and South, posting of preprint is low[41]. Respondents around the globe admitted that peer-reviewed journal articles are important for career progression, not much with preprints, given the low recognition the latter currently receive. Preprint servers are also facing Gen-AI attack. On October 31, 2025, the arXiv declared that it will not accept review papers and position papers in computer science because of recent peak of apparent Gen-AI-written papers[42]. Rise of rejection rate by the arXiv by four to fivefold is also alarming[43]. Since we are in a transition phase, such challenges are expected and we will continue addressing them. We also need to explore an appropriate, just[44] and resilient business model to run the '100% AI-reviewed (pre)print' world.

CONCLUSION

The prevailing models of peer-reviewed journals cannot make open research truly open, given their exploitative peer-review and financial systems. To replace that, if we work towards a future of AI-reviewed preprints, we need to answer an obvious question: What will be the role of journals if preprint servers are running the show? Apparently, there should be no 'journal' in the future as we know it for the past 360 years. The publishing industry is exorbitantly profitable and essentially capitalising on a harmful philosophy called 'publish or perish'. Such an industry shouldn't exist in its present form if we really want to establish equity and justice through open research.

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