

Publish or perish – how to escape from a vicious circle?

I read this joint editorial with great pleasure because it reflects on a core subject of science: the journal publication. In the following I'd like to share my personal concerns that the 'publish or perish system' is in danger to ruin itself and how we jointly might mitigate this risk by small changes of our community codex.

Since a few years the system is exposed to an increasing pressure due to an avalanche of submissions and increasing demand to accelerate the publication process (at least due to my personal experience as associate editor of HESS, Journal of Hydrology, and as HESS Executive Editor).

One major reason for this might be the current clash of publication cultures with 'real' open access publishing, which is essentially a non-profit model, and the traditional line of peer reviewed publications, operated as a profit model by commercial publishers. Speed in the publication process is at least weakly correlated with journal metrics, which is in turn correlated with increasing number of submissions. Acceleration might be desirable from a commercial point of view. However, too much speed will certainly lower quality assessment in the editorial process (which is by the way as a reviewing largely a voluntary community service) and might lead to a decreasing readership. At the end of the day this might turn the system into the absurd - papers without readers, because we are all too busy with writing. This endangers science in its fundament because reading (and thinking) is the fundament of learning. Open access is for me the best means to protect the system against the abyss of getting absurd, and unhealthy commercial pressures appear to me as strongest threat! (This is of course my personal opinion).

The other major problem, which can be solved within the community, is that journal publications serve different purposes, which are at least partly disjunctive:

- 1) The publication as independent qualification measure for PhDs: Our current codex requests on average three peer reviewed publications per Phd, as an (as much as possible) objective benchmark for the ability of the candidate to produce work of high scientific quality and to communicate and defend it against peers. This is a healthy success model as it assures an external assessment that is largely independent of the promoter!
- 2) The publication as a means of a scientific debate on possible scientific innovation and even possible new discoveries: HESS does for instance rank manuscripts with respect to a) scientific significance (not sure if everybody has exactly the same notion about this), b) scientific quality and c) presentation quality. It is virtually impossible to get a paper accepted that ranked as excellent/good with respect to b) and c) but poor (as being not a discovery) with respect to a).

With this we get into a vicious circle that we have to pretend that the every community member can produce on average one discovery per year. I personally doubt this (at least I can't!). I also believe that this is also a very dangerous signal to our science management (which partly explains the fact that why just count papers and compare non-conservative indices as the h-factor in our commissions, instead of reading the best papers to judge a scientist).

The direct consequence is that every submission today better starts with a more or less strong "we save the world scenario" (so do mine) to avoid falling between the cracks of either not being fundamentally new (or even being wrong). This might imply rejection and loosing at least half a year

on the way to the PhD, even if the work is of high scientific quality and very well presented – which is for me the necessary criterion to be qualified for a PhD. If the work is a fundamental advancement, even better! But we cannot expect that this is the case for every singly PhD thesis.

So how can we break out of this circle?

- We can partly change the codex with respect to the necessary number of publications for a PhD. This implies also that we revisit or criteria to award prizes to young scientists otherwise this would not be fair (maybe reading instead of counting). However, the journal publication as a means of scientific qualification as defined above remains essential (at least for me).
- The key to assure this without blowing the systems might be more diversity in our assessment of 'scientific significance', for instance:
 - o Fundamental discoveries such as suggestions of new theories, rejection of established theories, new experimental concepts and technologies, new metrics and methods ...
 - o Significant and sound applications of established science in places, because every place is unique;
 - o To establish a culture where learning due to failure (if the work is technically sound) is not punished with rejection. Science history shows there is much to learn from sound failures.

This would allow us to guide technically sound and well-presented studies to the right front end of our journals (which implies to make it more diverse), instead of rejection them as being not of fundamental significance. This would also lower the pressure of starting with the "we save the world scenario" (which might be annoying for the author and the writer) and sustain that the journal publication remains a means of scientific qualification, without blowing the system.

Submissions aiming at fundamental advancement for the field are by nature controversial and might thus polarize the reviewers (great or reject) and can of course be 'wrong'. To avoid an error of the second kind (reject a real advancement) in case of a controversial assessment and to allow to learn from being wrong, such a submission could be published with a controversial comment. This works within the open access paradigm and might encourage all of us to think out of the box.

Best regards and thanks to all Editors for this initiative,

Erwin Zehe