
Original article

Where can early career researchers learn how to peer review a scientific paper?

Mariana Pinto da Costa

Hospital de Magalhães Lemos, Porto, Portugal; Institute of Biomedical Sciences Abel Salazar (ICBAS), University of Porto, Porto, Portugal; Unit for Social and Community Psychiatry (WHO Collaborating Centre for Mental Health Services Development), Queen Mary University of London, London, United Kingdom; mariana.pintodacosta@gmail.com

José Oliveira

Centro Hospitalar Psiquiátrico de Lisboa, Lisboa, Portugal

Jibril Abdulmalik

Department of Psychiatry, College of Medicine, University of Ibadan, Nigeria

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Abstract

Background: The ability to peer review a scientific paper is an important skill for researchers, but many early career researchers do not obtain relevant training. In this article, we aimed to identify and describe the different resources available for researchers to learn how to peer review.

Methods: We conducted a web-based search, looking for resources that teach how to peer review. In addition, we contacted authors who published with the terms “peer review” or “early career researchers”, enquiring about the resources they were acquainted with. We used a SWOT framework to analyse the resources with a direct focus on practical teaching of peer review and widespread availability.

Results: We found seven formats of resources available: practical structured peer review training courses; online guidelines; online webinars/videos; journal clubs of post-publication reviews; critical appraisal meetings of pre-publication reviews; editorial board experiences and support from supervisors/mentors. The authors contacted described the main purpose of each resource and how directly they focused on the purpose of teaching competencies to peer review. These resources also vary in their format: either online or face-to-face, independently or in a group. Only one resource was directly focused on practically teaching how to peer review and was readily available online at no cost.

Conclusions: The utilization of these resources may be the answer to the expressed needs of the academic community to see support for peer review in place, guiding early career researchers on how to peer review and addressing the current difficulties that editors face in finding reviewers.

Keywords: peer review, training, writing, early career researchers, reviewers, SWOT

Introduction

Peer review is at the heart of scientific research: it aims to mitigate the risk of inaccuracy and improve the quality of published literature. Traditionally, submitted manuscripts must survive the rigorous scrutiny of experts, before they are considered worthy of presentation to the larger scientific community and accepted for publication. Many argue that transparency and consensus in research relies on this peer review process.¹

Reviewers should be experts in a particular field, have the necessary experience and knowledge to evaluate whether the methodology is appropriate, the results accurate, the interpretations reasonable, and the references relevant;² whilst being capable of highlighting omissions and suggesting changes to improve readability.³ Reviewers are expected to alert the editor to any problems they identify, and make recommendations if a paper should be accepted, returned to the authors for revisions or rejected.

Finding reviewers is difficult for two-thirds of editors,⁴ a situation exacerbated by the increasing number of scientific papers published.⁵ Yet, as many as two-thirds of researchers who never peer reviewed would like to.⁴ They are motivated to play a part in the academic community, return the assistance and improve the scientific literature.⁴

Despite the importance for early career researchers to learn how to peer review, there is a huge lack of such formal training.⁶ Several undergraduate and postgraduate programmes do not explicitly teach or provide training on how to review papers. Most early career researchers are left to learn it under the guidance of their supervisors or colleagues, through journal club discussions or simply through trial and error attempts.⁷ Studies reported that over half of the reviewers learnt to review once they started to publish papers, by reading the reviews they received of their own submitted manuscripts, while others learnt ‘on the job’ once writing reviews,⁸ or by checking the guidelines that some journals have.⁴ Nevertheless, a study found that two-thirds of researchers claim for formal training on peer review.⁷

In this article, we identify and describe the different formats of resources available for researchers to learn how to peer review.

Methods

We conducted a web-based search in English using Google, looking for resources that teach how to peer review. In addition, we contacted a purposive sample of twenty authors that published with the terms “peer review” or “early career researchers”, enquiring about the resources they were acquainted with and their experience with them.

We used a SWOT (strengths, weaknesses, opportunities and threats) framework to analyze the resources directly focused on practical and structured teaching peer review,

and widespread available (online and free), basing it in the authors' personal experience with this resource.

Results

We found seven types of resources available (Table 1), which vary in their format of delivery: either online or face-to-face, individually or in a group. Their main purpose differs as well on how focused they are in teaching competencies to peer review.

Table 1. Resources available linked with learning to peer review

Resource
Practical and structured peer review training courses
Online guidelines
Online webinars and videos
Journal clubs of post-publication reviews
Critical appraisal meetings of pre-publication reviews
Editorial board experiences
Supervisors/mentors

Practical structured peer review training courses

Peer review training courses exist online (eg www.peer-review-network.eu/) or in a day workshop, requiring a registration fee to participants. Some universities freely offer a half-day course to their students, but their lack of regularity may result in many students finishing their studies without being able to attend them. In addition, some participants reported not really having the opportunity for 'hands-on' experience writing a peer review and receiving feedback in such practical courses.

We identified only one structured peer review training course that is readily available online and free: the Publons Academy. It has been developed in conjunction with researchers, reviewers and journal editors. Each of its 10 modules includes two videos (one with information about the module and another with an 'expert tip') and a set of slides, instructing students on what they need to do. The academy recommends the use of the 'Review Template' that lists the specific points to consider in a review, as well as the format to convey it. Every student needs to have a supervisor, who may be a senior colleague or their work supervisor, ensuring that the student receives feedback from an experienced scholar from the same field. If the

Table 2. SWOT framework of Publons Academy

	Positive	Negative
Internal	<p>Strengths</p> <ul style="list-style-type: none"> • Structured • Online • Free • Interactive (with videos) • Separate modules focusing on each section of a manuscript • Clear instructions • Practical exercises • Supervision by an expert in the field • Recognition of the acquired expertise (certificate) • Advising to use a 'Review Template' (for a standardised review format) 	<p>Weaknesses</p> <ul style="list-style-type: none"> • May be difficult to invite a supervisor • Lack of clarity or training for supervisors on their role in this course • Amount of work for the supervisor • Dependence of the student on the feedback from the supervisor (and their capacity and speed to provide it) to be able to finish the course • Difficult to un-invite a supervisor, who is unresponsive • The 'resource paper' may not be easy to review to all researchers across different scientific domains • Strict in allowing only to do post-publication reviews of published articles with DOI • Lack of links to external resources on peer reviewing • Lack of differentiation to different scientific domains
	<p>Opportunities</p> <ul style="list-style-type: none"> • Potential of an academic social network • Strengthen collaboration with other course participants • Strengthen collaboration with the supervisor • Improve access to reviewers by journal editors • Improve access to journal editors by early career researchers • Raise the recognition of reviewers' work • Support the concept of core competencies to peer review • Can be integrated in postgraduate programmes (MSc or PhD) 	<p>Threats</p> <ul style="list-style-type: none"> • Not having access to the internet • Difficulties in selecting publications with DOI in developing countries • Overload of information • Not finishing the course • Similar initiatives arising in the market
External		

student does not find a willing supervisor, the academy can provide one. By the end of the course the student has reviewed four papers: the 'resource paper'⁹ provided by the academy, plus three other published papers of the students' choice, and received feedback from their supervisor. Upon completion of the course, students get recognition for the skills acquired and are endorsed as trained reviewers. As we have passed through the course we present the SWOT framework of Publons Academy in Table 2.

Online guidelines

Online guidelines are offered by some publishers and journals (eg Wiley Authors Services, BMJ training materials and How-to series) and provide instructions and tips on how to peer review, that improve the quality of manuscripts.¹⁰

Online webinars and videos

Online webinars and videos available through some publishers (eg www.publishingcampus.elsevier.com) also provide instructions and tips on how to peer review. These may cover information about peer reviewing in a specific topic, in a format with no sequence, and do not assess if people that watch them improve their peer review skills afterwards.

Journal clubs of post-publication reviews

Journal clubs are educational meetings routinely used by researchers and health practitioners to keep up-to-date with scientific literature.¹¹ They can be a way to improve participants' reading habits and knowledge of research methods, and they also result in significant improvements, especially in those with the least initial experience of reading and appraising papers.¹¹ Discussing these papers, especially if guided by critical appraisal checklists (eg casp-uk.net), can help to acquire the competencies needed in a typical peer review process.¹² Despite their global popularity, lack of resources makes journal clubs difficult to start or maintain in some settings, such as in the developing world.¹³

Critical appraisal meetings

Critical appraisal meetings are face-to-face meetings in research departments, where several researchers provide feedback and appraisal of a paper before it is submitted to a journal for publication. This format can lead to creative discussions and help authors to improve their manuscripts. One place that offers them is the Unit for Social and Community Psychiatry at Queen Mary, University of London. On these occasions, a manuscript that will be submitted to a scientific journal is circulated to the researchers at the Unit (around 30) for them to read beforehand. The paper is then discussed during a one-hour slot, where several researchers (graduates, PhD students, postdocs and Principal Investigators) provide their critical appraisal feedback. These meetings can be useful seeing the approach of other researchers to the task of reviewing a paper. Equally, researchers can learn how to convey criticism in a face-to-face group format and how the presenter reacts to these comments in real time. These competencies extend beyond the skills truly needed to peer review, but they may generate other useful skills to succeed in academia.

Editorial boards

Being part of an editorial board team is a privileged opportunity for only a few early career researchers to play a role in the journal's publication process, and there are several models of editorial training and mentorship.⁶ These opportunities are unlikely to be the first step for someone who has no experience in peer reviewing, but are rather an opportunity for those who already have appropriate skills to develop them further.

Supervisors and mentors

Supervisors and mentors have a key role to support and guide researchers in several matters, and this is also the case with becoming skilled in peer reviewing. If early career researchers inform them of their interest in reviewing, they can provide researchers with such opportunities.

Discussion

Resources are available to learn how to peer review a scientific paper, which can be useful for inexperienced reviewers to learn the skills, and provide them with the confidence to apply them; but they may also serve more experienced reviewers, guiding them on how to write a good, structured, useful, and polite review. Previous findings suggest that websites and senior colleagues are amongst the preferred sources.¹⁴

Practical structured peer review training courses endorse the concept of core competencies to peer review.¹⁵ Such sets of universally agreed reviewer competencies, with some variation at the individual level, could provide the basis for both a training framework and ongoing evaluation of reviewer's quality.

The Publons Academy is a promising resource, which is unique in allowing students to practise writing real post-publication reviews with feedback from a supervisor in their field. The academy has more than 100,000 recognized reviewers, and serves as a social network of academics. Participating in this course enables students to liaise directly with journal editors and vice-versa, increasing the reviewer pool. Journal editors will be alerted to the newly trained reviewers available, and early career researchers can put themselves forward to prove their newfound expertise. Furthermore, the academy raises the recognition of reviewers' work, displaying the journals to which researchers contributed as reviewers and how often.¹⁶ Another resource planned to be launched soon, the Nature Master Class, was described in its announcement as a free online course focused on peer review. The use of these resources by the substantial number of researchers inexperienced in peer reviewing, but interested in getting skilled, could be a way to tackle the needs of the academic community to see effective support for peer reviewing in place, addressing the difficulties that editors face in recruiting and retaining skilled reviewers,¹⁷ and increasing the peer reviewing process speed.¹⁸

The main way researchers start peer reviewing is through direct approaches by editorial boards, whereas about a quarter of current reviewers were invited by their supervisors.⁴ Improving the quality of the reviews will improve the quality

of the journals. Editors could recommend their experienced reviewers to involve their students as joint or sole reviewers on relevant papers; equally they could encourage early career researchers to get formal training in peer reviewing, using the resources identified in this paper. Such approach may challenge the current *status quo* that you need to be senior to be an expert in the field. Inviting early career researchers as reviewers once they have such training, could act as a first step in the editorial involvement ladder, inspiring some of them to become editors themselves later.

Publishing and peer reviewing are linked, and studies suggest that 90% of authors are also reviewers.¹⁹ The few authors who publish many papers but do little or no peer review unbalance the system. It might be possible to track the number of papers an author has submitted versus the number they have reviewed, adopting a *quid pro quo* principle. Generally peer review has been a voluntary exercise, where researchers are expected to review for the intrinsic altruism of giving back to the scientific community. Some journals publish their list of reviewers annually or provide them with certificates, recognizing their efforts.⁷ These incentives could support peer review as a civic obligation to the broader scientific community.

Importantly, early career researchers and editors should be aware of possible biases that might influence peer review. Reviewers should not have strong feelings (positive or negative) towards the authors and be able to be independent. These prejudices include gender, seniority and regional bias.³ Studies showed that abstracts with female senior authors are more poorly reviewed than abstracts with male senior authors, the so called “Matilda Effect”,²⁰ and receive fewer citations.²¹ Likewise, early career researchers may feel inhibited to perform a judicious review, not challenging senior researchers.²² Yet, studies showed that journal editors have considered the reviews from early career researchers superior to those from senior researchers, perhaps as they put in more time and effort.²³ In terms of confidentiality, reviewers should follow the policy and format of the journal they accept to review for (single blind, double blind or open peer review). Each format may entail its own pros and cons,²⁴ yet there is a strong preference for double blind reviews from everyone involved: authors, reviewers and editors³, which prevents reviewer-discrimination based on the author’s identity; this is also what early career researchers expressed: feeling more comfortable reviewing anonymously.³ Another novel model is the F1000 Research (<https://f1000research.com/>) of open access, open data publishing in which the article is immediately published, enabling fast dissemination and citation. The peer review process is led by the authors, who suggest reviewers, until two reviews are received; those articles that pass peer review are indexed in external databases (eg PubMed and Scopus).

We expect that by presenting in this article the resources available to learn how to peer review a scientific paper, we encourage early career researchers to develop their skills, understand the peer review process and start peer reviewing. We may have disregarded some of the resources, which are not publicly available or that these experts were not aware of. A more detailed, in-depth search and public discussion

on this matter will support a thorough documentation of all resources available. We also used a SWOT framework²⁵ to gain further awareness of the only resource we found directly focused in teaching peer review that was practical and of currently widespread availability. This framework can be applied in the future to analyse other resources, and involve other stakeholders (eg supervisors, journal editors), enabling a comparison with our assessment.

Despite the reports of fake or poor quality reviews that lead to the retraction of papers,²⁶ which show that peer reviewing is far from being a perfect system, it may still be the best possible system in place to assure scientific quality control across journals.⁸

As final remarks, the *expertise* that researchers gain from their time and experience in a field are priceless competencies, and reviewers are likely to develop their own review style. In that spirit, the resources and guidelines presented in this article serve as a starting point rather than a narrow prescription.

References

- Nicholas KA, Gordon WS. A quick guide to writing a solid peer review. *Eos*. 2011 Jul 12;92(28):233–4.
- Guraya S. Accuracy of references in scholarly journals: An analysis of 450 references in ten biomedical journals. *European Science Editing* 2014; 40(4):88–90.
- Devine E, Frass W. Peer review in 2015 - a global view. A white paper from Taylor & Francis. 2015; Available at: [http://authorservices.taylorandfrancis.com/custom/uploads/2015/10/Peer review-2015-white-paper.pdf](http://authorservices.taylorandfrancis.com/custom/uploads/2015/10/Peer%20review-2015-white-paper.pdf) (accessed 10 August 2017).
- Devine E, Frass W. Peer review - A global view. Motivations, training and support in peer review. 2016; Available at: <http://authorservices.taylorandfrancis.com/custom/uploads/2016/07/Peer-review-supplement-motivations-and-support.pdf> (accessed 10 August 2017).
- Bornmann L, Mutz R. Growth rates of modern science: A bibliometric analysis based on the number of publications and cited references. *Journal of the Association for Information Science and Technology*. 2015;66(11):2215–22.
- Radhakrishnan R, Wasser T, Picon F, *et al*. Editorial training models for early-career psychiatrists. *Lancet Psychiatry*. 2017;4(7):515–6.
- Warne V. Rewarding reviewers – sense or sensibility? A Wiley study explained. *Learned Publishing*. 2016;29(1):41–50.
- Paltridge B. Learning to review submissions to peer reviewed journals: how do they do it? *International Journal of Research and Development*. 2013;4(1):6–18.
- Olenski AR, Abola MV, Jena AB. Do heads of government age more quickly? Observational study comparing mortality between elected leaders and runners-up in national elections of 17 countries. *BMJ*. 2015;351:h6424.
- Cobo E, Cortés J, Ribera JM, *et al*. Effect of using reporting guidelines during peer review on quality of final manuscripts submitted to a biomedical journal: masked randomised trial. *BMJ*. 2011;343:d6783.
- Deenadayalan Y, Grimmer-Somers K, Prior M, *et al*. How to run an effective journal club: a systematic review. *Journal of Evaluation in Clinical Practice*. 2008;14(5):898–911.
- Pearce-Smith N. A journal club is an effective tool for assisting librarians in the practice of evidence-based librarianship: a case study. *Health Information and Libraries Journal*. 2006;23(1):32–40.

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According to your opinion, what is the crucial responsibility of editors?

Their key responsibility is to promote science, to help reporting truth about this world, and to keep the journals clean and free of fraud and abuse. With the ever-increasing numbers of manuscripts it is sometimes difficult to separate the wheat from the chaff. And in doing so one has always to act tactfully.

Are there some other roles for editors beyond editing and decision making?

Yes, in my opinion, the educational role is of great importance, especially in the present post-modern era characterized by rapid changes and superficial approach in many aspects of life and communication, science being not an exception. In many countries that do not have a long tradition in biomedical research, most authors are appreciative of any advice and help they obtain from editors. We need to teach young authors the ethical principles of publishing, make them understand that their work to be published has to be solid and reliable for others to build on it.

What would you classify as a “scientific waste”?

Not only is it the huge amount of money spent on research that never gets published – the shocking numbers we heard at the conference in Edinburgh in September of 2015 – but also research results published that are only made available to scientists if they pay large sums to publishers, just for access to this vital information. This situation is even more absurd when the same scientists have to pay incredible amounts of money to have their papers published. It is known that the big publishers in all silence make enormous profits on science journals they publish, having swallowed most of the smaller publishers. A fair thing to do would be to allocate a solid part of their profit back to scientists (and reviewers) who work for them for free.

What is your viewpoint on the rapidly emerging, so-called predatory journals of questionable credibility? How should the scientific community properly react to them?

This has to do with your previous question. As long as publishing in established journals remains prohibitive for many authors, the predatory journals can be expected to flourish. Young authors should be alerted and told details about these journals and how to avoid them. The scientific community should not be driven any more by the Impact Factor frenzy (journals such as *Nature* and *Science* publish increasingly articles on that topic, for example: “Bibliometrics: An obituary for the impact factor”, *Nature* 546, 600, 2017). Publishing in prestigious (ie high impact) journals has become a must for many. However, good science can also be found in small journals but it has to be looked for, acknowledged and cited. University journals that keep some degree of freedom and independence can here do an excellent service to authors, especially to the fledgling ones.

What is your opinion about Open Access in scientific publishing?

Open Access is fine, provided that it really is open. As we all know, often this is not the case. Some geographical regions are exempt from Open Access, others not but they have to pay more and more for access to databases. There is Green and Gold and Hybrid Open Access. The entire publishing scene has become a huge money making business. Many universities worldwide cannot pay their subscriptions any more. Some substantial changes have to come; the sooner the better. An important role in this context can be seen in the power of associations such as EASE, WAME, APAME, COPE and others, to make achievements of science open to scientists worldwide.

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- 13 Tucker J, Gao X, Wang S, *et al.* Organising an English journal club in the developing world. *Postgraduate Medical Journal*. 2004;80(946):436–7.
- 14 Gama Marques J, Pantovic Stefanovic M, Mitkovic-Voncina M, *et al.* Equal access for all? Access to medical information for European psychiatric trainees. *Psychiatry Research*. 2016;238:150–2.
- 15 Glasziou P, Altman DG, Bossuyt P, *et al.* Reducing waste from incomplete or unusable reports of biomedical research. *Lancet*. 2014;383(9913):267–76.
- 16 Johnston D. Peer review incentives: a simple idea to encourage fast and effective peer review. *European Science Editing*. 2015;41(3):70–1.
- 17 Bloom T, Burley R, Chabrol E, *et al.* What might peer review look like in 2030? 2017;
- 18 Powell K. Does it take too long to publish research? *Nature*. 2016;530(7589):148.
- 19 Ware M, Monkman M. Peer review in scholarly journals: perspective of the scholarly community – results from an international study. 2008. *Information Services & Use*. 28 (2): 109–112.
- 20 Knobloch-Westerwick S, Glynn CJ, Huge M. The Matilda Effect in Science Communication: An Experiment on Gender Bias in Publication Quality Perceptions and Collaboration Interest. *Science Communication*. 2013;35(5):603–25.
- 21 Larivière V, Ni C, Gingras Y, *et al.* Bibliometrics: global gender disparities in science. *Nature*. 2013;504(7479):211–3.
- 22 Mulligan A, Hall L, Raphael E. Peer review in a changing world: An international study measuring the attitudes of researchers. *Journal of the Association for Information Science and Technology*. 2013;64(1):132–61.
- 23 Rockwell S. Ethics of peer review: a guide for manuscript reviewers. 2006; Available at: <http://med.mui.ac.ir/kargah/Ethics.pdf> (accessed 10 August 2017).
- 24 van Rooyen S, Godlee F, Evans S, *et al.* Effect of open peer review on quality of reviews and on reviewers’ recommendations: a randomised trial. *BMJ*. 1999;318(7175):23–7.
- 25 Helms MM, Nixon J. Exploring SWOT analysis – where are we now?: A review of academic research from the last decade. *Journal of Strategy and Management*. 2010;3(3):215–51.
- 26 Fountain H. Science Journal Pulls 60 Papers in Peer-Review Fraud. 2014; Available at: <http://www.nytimes.com/2014/07/11/science/science-journal-pulls-60-papers-in-peer-review-fraud.html> (accessed 10 August 2017).