Improving peer review: who's responsible?

Peer review needs recognition at every stage of scientific life

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Peer review matters. Why? Firstly, scientific assertions can't be proved; they can only be disproved. The doubts raised by peer reviewers are therefore a crucial element in scientific reasoning. More specifically, as Francis Bacon put it in 1605, the "registering and posting of doubts has a *double* use:" it not only guards us "against errors," but also furthers the process of inquiry, causing issues that would otherwise be "passed by lightly without intervention" to be "attentively and carefully observed." Moreover, since scientific findings effectively don't exist until they're in written form, the doubts raised during editorial peer review come at a particularly crucial step in the overall scientific process.¹ Secondly, the exchange of information for professional recognition is the principal instrument of social control within the scientific community.² Approval by peer review is perhaps the single most powerful expression of that recognition. Thirdly, and more pragmatically, journal editors depend heavily on peer review to accomplish their two main tasks—selecting papers and improving their quality^{1 3}—even though editors themselves are apparently the source of substantive improvements to manuscripts more often than either peer reviewers or statisticians.⁴

The quality of many manuscript reviews is excellent, but in many others it is, unfortunately, still far from optimal. Therefore editors of journals might understandably look for ways to improve reviewers' performance. The paper in this issue by Schroter et al reports on a carefully controlled randomised trial of educational interventions designed to do just that.⁵

Sadly the result is essentially negative: the small improvements found in some measures of review quality were judged to be "not of editorial significance," and faded over time. Sadly, this result is also highly predictable. The report provides few details, but the educational programmes seem to have been short, cognitively focused, and largely didactic (passive)—all features that decades of educational research tell us are relatively ineffective in producing meaningful changes in practice.⁶⁻⁸

Peer reviewing is after all an applied skill—like architecture, flying aeroplanes, or clinical medicine—a practice, rather than a purely cognitive attribute, that is, knowing a lot. All practitioners need to become good at "reflection in action," the mix of analytical, judging, and performing skills that is essential for handling the complex, unfamiliar, and ill formed problems they're called on to handle.⁹ And, as John Dewey and others have told us for the past 65 years, acquiring these applied skills requires "learning by doing," a process, sometimes referred to as "experiential learning,"¹⁰ that differs fundamentally from traditional cognitive (or "rationalist") classroom learning. Although the experiential learning "cycle"¹⁰ includes important cognitive elements (reflection, integration of experience with established explanatory models), the true curriculum in experiential learning is the experience itself¹¹; it requires hands-on involvement by learners—fully, openly, and without bias—in the relevant tasks: a

"practicum"⁹; and experiential learners need to receive their guidance from coaches, rather than absorbing information from lecturers.⁹

Whether by intention or not the present report provides strong evidence that experiential learning is important in peer review. It cites extended training in epidemiology and statistics—a hands-on, problem solving experience under expert guidance—as a known characteristic of high quality peer reviewers. And it makes us realise that most editors are themselves highly skilled reviewers. How do they get that way? They critically assess the quality of manuscripts, day after day, thousands of them over the years. And they receive repeated, timely, on-the-job feedback from a variety of coaches, including their editorial and statistician colleagues, not to mention peer reviewers. The difficulty that many peer reviewers have in producing high quality reviews shouldn't, therefore, surprise us, any more than the difficulty most lawyers would have in flying aeroplanes: most reviewers, chosen for their expertise in clinical or research areas, simply haven't had the requisite opportunities for experiential learning in critical assessment.¹²

So does this largely negative study help? Yes. It can discourage further use of precious time, energy, and funds for the kind of educational intervention that's unlikely to be effective. Further, it can focus attention on more productive research questions—for example: What's the actual learning curve for high quality peer review (in particular, how many reviews are required)? How does the length of time a reviewer spends on a review affect its quality? And what's the optimal mix of input from peer reviewers, editors, and statisticians in the overall editorial process?

Finally, the study suggests that editors, for all their strengths, can hardly be expected to fix the problems of peer review on their own, any more than schools can be expected to solve the problems of education singlehandedly. True, in the short term, editors might be more effective if they were to "train the trainers," rather than trying to train reviewers directly. But there is probably no quick fix here. Peer review is such a fundamental element of critical scientific thinking that the entire scientific and scholarly community should arguably take on the responsibility for improving and maintaining its quality—a major, long term commitment. Why isn't substantial, formal training in peer review an important and integral part of all graduate level training in basic science in clinical medicine? It should be. Moreover, serious consideration should be given to developing certification in peer review, and certified reviewers might be required to do a defined minimum number of reviews every year to maintain their credentials. And, finally, why isn't peer review considered worthy of serious academic recognition? It should be. Promotion, tenure, and funding decisions should take the quantity and quality of candidates' peer reviewing into account.

Much good can come out of this study if it serves as a wake up call. The message: the broader scientific and scholarly communities need to get serious about making

high quality peer review an integral part of all aspects of professional life, including training, practice, and reward systems.

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BMJ training for peer reviewers

We are offering free courses in London and a training pack on bmj.com

Peer review, although fundamental to science, has been largely an amateur process, with new reviewers learning their trade like apprentices.¹ You can learn about critical appraisal of research papers and other academic articles in many places. But do peer reviewers know what editors want from them? Clearly, many do, and the *BMJ* is lucky to have hundreds of excellent reviewers. We don't want to rely on luck, however, so this week the *BMJ* is launching a programme of training for peer reviewers.

We have published a free package of learning material at http://bmj.com/advice/peer_review/. The training has four aims: to tell participants about the state of peer review research; to make clear to them what constitutes a good review; to help them understand what matters to *BMJ* editors about reviews; and to help them to produce good reviews. From April, we will be offering the same material through half day workshops that will also give reviewers the chance to quiz *BMJ* editors.

We have been thinking for years about offering training for peer reviewers, but we wanted to wait until we had developed and tested workable material that could be used in workshops and for self teaching. Now that the randomised controlled trial of training for *BMJ* peer reviewers has been published (p 673), we are ready to start.² The trial showed that training was feasible and yielded some improvements in the quality of reviewers' reports. The benefits were slight, however, and were not sustained. Of course, more research is needed.³

So much for evidence based policy making, you may say. If the authors of the trial concluded "very short training has only a marginal impact. We cannot therefore, recommend use of the intervention we studied," why have we decided to use the intervention anyway? We have several reasons, all of which boil down to the fact that we want to do this as a service to reviewers and, most importantly, we hope the training will prove to be useful. The main reason is that most participants said during formal feedback that they enjoyed the training. We believe that training is a potentially important way for us to recruit, inform, and retain good

reviewers. The trial showed that the intervention did not worsen the quality of reviews. In the workshops held during the trial, editors felt they learned much from reviewers. Furthermore, the package of learning material is not set in stone: we will expect to amend it in response to further evaluation.

We have recently offered the training to the reviewers who comprised the control group in the trial, and we would like to extend that invitation to all other reviewers. We plan to hold a couple of workshops a year, and we will advertise these in the journal. This year we are holding five workshops, to ensure that everyone in the trial's control group who wants to be trained can attend (box). We have invited those trial participants personally, but there will also be room for 50 other *BMJ* reviewers. We hope lots of you will come along and that many more of you will use the training package on bmj.com.

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Competing interests: SS was the principal investigator of the randomised controlled trial of training for *BMJ* peer reviewers. TG did some of the face to face training during the trial and rated reviewers' reports. Both will run the peer review training programme but neither will receive any direct payment from this.

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Peer review workshops: further information

The peer review training workshops will be held at BMA House, Tavistock Square, London WC1H 9JP

During 2004 the workshops will be on 28 April, 11 May, 29 June, 13 September, and 15 October. Each will run from 10 am to 1 pm

We are offering 50 places, allocated on a first come, first served basis. If you are interested in attending please email Janet Cross (training@bmj.com), stating your order of preference for the above dates