

Use of peer review for quality control of scientific, medical and technical electronic publications

Introduction

Quality control of a electronic publication influences journal's impact factor, the number of article downloads, the rejection rate, the number of subscriptions and is closely associated with whether the journal is peer reviewed or not (Hernon & Schwartz, 2003). Peer review has a long tradition in scientific, medical and technical (SMT) publishing. It has emerged from the need of editors to ask other knowledgeable people to examine written work and express their opinion on whether the content reached certain level of quality and is therefore suitable for publication in a particular journal. Such practice was first adopted in the UK by the Royal Society of Edinburgh in 1731 (Spier, 2002) and had been later utilised by other publishing societies. Since then the purpose of peer review process did not change, although in recent years many publishers have adopted electronic peer review.

In the following paragraphs we will examine the distinction between traditional and electronic peer review models. The impact of blind peer review in an online environment will also be mentioned and compared with open peer review which is considered to be used more often in recent years especially in conjunction with online pre-publication peer review process.

Traditional peer review model

In traditional peer review process author submits a manuscript to the editor who accepts, rejects manuscript or sends it to one, two or more reviewers. Reviewers then make recommendations about acceptance, rejection or revision of the manuscript to the editor and editor again decides whether a manuscript should be revised, accepted or rejected. Authors usually do not know who the reviewers of their manuscripts are. Spier (2002) states that blind or anonymous peer review has been a practice since the 1750s while Madden (2000) claims there is no record of it and even journals with high impact factor such as Nature or Science have no records about the time they began with anonymous peer review.

Although an anonymous peer review is viewed as an important part of review process because it "encourages referees to give unconstrained opinions" (Madden, 2000) it also has some critics who emphasize it can be abused and is to blame for slower advances in science because it can dismiss new, unconventional ideas. In addition it may not prevent erroneous, plagiarized or fraudulent content to be published (DeMaria, 2002). In contrast to blind peer review, a double blind peer review does not reveal neither author's nor reviewers' name, position or affiliation. Its opposite is an open peer review where names of the author and reviewers are known to one another.

Peer review for electronic publications

Scientific, medical and technical electronic publications are considered to be adopting the most advanced solutions in editorial process and peer review because of the rapid developments in their field and a large number of articles written and submitted for publication. Journals aim to publish research papers as soon as possible after they have been written, although that does not mean that their

quality suffers because of time constraints. In addition to traditional peer review model, in an online environment experiments with several combinations of pre- and post-publication peer review have been conducted. Some journals publish non-peer reviewed articles while others experiment with open peer review.

The peer review process for electronic journals (or printed) can be conducted electronically (via email or uploaded on a server to which a reviewer has access) or on paper (Hernon & Schwartz, 2003). ESPERE project (Electronic Submission and Peer Review project) focused on electronic peer review of papers submitted to associations in United Kingdom (Weller, 2002). When it started, in 1996, information technology still posed some problems to novice users – file formats and electronic mail were seen as difficult to use and files could be slow to upload over dial-up connections if larger than 1MB (Wood, 2001). In the next five years several systems for manuscript tracking and online peer review became available, for example, ESPERE, PaperPath, Rapid Review and XpressTrack (ibid.). These (and other) systems were gradually replacing submissions of articles by post and email especially for journals with a large number of submitted manuscripts or those owned by large publishers. For example, the Royal Society has its own e-Pubs online publication system, which enables submission of articles, facilitates peer review process, supports editor's decisions and helps publishing staff to manage workflow (Royal Society's electronic Publications system, 2006).

Mulligan (2005) claims that with the development of online systems the refereeing process was facilitated for authors and editors but not necessarily for a reviewers, as they are not used to review an article on screen but rather print it and review it on paper. They are later expected to submit their comments to the editor electronically. This can be a time consuming process for reviewers who conduct a thorough review and could potentially discourage them doing it.

Online variations of peer review process

As it was mentioned earlier, several practices of peer review exist in an online environment. They are modifications of traditional model and include “unblended reviews, publication of reviews, and even publication of virtually all submitted manuscripts (at least on-line)” (DeMaria, 2002). We will examine few practices of different journals in order to see which practice can lead to better quality of published articles or has other advantages over traditional model.

In 1997 The Lancet medical journal introduced a “fast-track” publication, which enabled a short publication timeline, usually only four weeks long (Weeler, 2002). Later other medical journals followed their example, for instance The British Medical Journal (2006) used service named “Fast track” for articles of exceptional clinical importance or those requiring urgent publication. Its main feature is a fast peer review process that enables an article to be published in extremely short time after submission in contrast to regular peer review process and publication, which may be completed in several months or even years.

The British Medical Journal also experimented with open peer review process and conducted a research (Van Rooyen, 1999) which showed open peer review had no effect on the quality of reviewing but at the same time increased reviewers' rejection rate to participate in review. Nevertheless, because of other advantages, the journal started to practice open peer review and predicted future

implementation of an online peer review process where authors and readers could share comments and opinions (Smith, 1999). In 2003 a rapid electronic response was available online and readers were able to comment the articles. Authors had then an opportunity to provide additional commentary to support the content in published paper (McDonough, 2004) or make amends.

Editor Stevan Harnad first implemented an idea of online prepublication peer review process in journal *Psychology*. A similar practice forms a part of peer review process in *Journal of Interactive Media in Education* (2005) or *JIME*. Peer review process in *JIME* is divided into private and public open peer reviews, which are conducted prior to publication. Private open peer review is similar to traditional peer review model while public open peer review gives readers a chance to comment and discuss content with the author who can then in collaboration with an editor revise an article prior to publication in journal.

Conclusions

In the traditional print paper publishing an established practice for readers to comment published articles or other content of a journal after the publication are letters to the editor. Letters were the only reader's opportunity to act as a reviewer (Sadun, Cox, & Minckler, 2002) while in some electronic journals readers are already able to post comments directly to the author, editor or on the web site.

In SMT publishing we are facing a relatively new model of peer review where the manuscript is available for public peer review after it has been accepted for publication. When a certain amount of time passes the article is finalized and published. Electronic peer review has proven to be facilitating the peer review process and more contributors got opportunity to make comments. Such practice can lead to better quality of published articles due to the number of reviewers that is greater than in traditional model and more potential problems can be discovered prior to publication.

More and more journals are replacing blind or double blind peer review with open peer review, which is especially important online where readers should be identified when posting comments in order to avoid anonymous spam and/or destructive criticism.

In addition to quality issues peer review process also influences the speed of publication. There is no need for editorial staff to send papers by mail to reviewer or key in the corrections he or she recommends. Authors from all over the world are therefore more likely to be invited to participate in the review process. Speed of publication was greatly improved by some journals, which have special peer review process for articles that need immediate publication. In addition to high level of quality control, this practice can also contribute to higher impact factor of a journal.

To conclude, it is evident an electronic peer review has offered authors, editors, reviewers and readers additional features to communicate and discuss online and many SMT journals are implementing these features to facilitate editorial peer review process in addition to adding value to their publications. It is likely to expect that these alternative models will be extremely successful in the future when readers become used to online discussions about manuscripts and published articles.

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