

Web Quality Control for Lectures: Supercourse and Amazon.com

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Abstract Peer review has been at the corner stone of quality control of the biomedical journals in the past 300 years. With the emergency of the Internet, new models of quality control and peer review are emerging. However, such models are poorly investigated. We would argue that the popular system of quality control used in *Amazon.com* offers a way to ensure continuous quality improvement in the area of research communications on the Internet. Such system is providing an interesting alternative to the traditional peer review approaches used in the biomedical journals and challenges the traditional paradigms of scientific publishing. This idea is being explored in the context of Supercourse, a library of 2,350 prevention lectures, shared for free by faculty members from over 150 countries. Supercourse is successfully utilizing quality control approaches that are similar to *Amazon.com* model. Clearly, the existing approaches and emerging alternatives for quality control in scientific communications needs to be assessed scientifically. Rapid explosion of internet technologies could be leveraged to produce better, more cost effective systems for quality control in the biomedical publications and across all sciences.

Emerging Alternatives to Peer Review: Amazon.com Model?

In 1997, our group published a controversial article on the evolution of research communications in the *British Medical Journal*. We argued that an *Amazon.com* information exchange model (1) might provide faster and more cost effective model than the existing scientific journal system. We argue that in addition to a new mode of information exchange, *Amazon.com* model offers a way to ensure continuous quality improvement in the area of research communications on the Internet by providing an interesting alternative to the traditional peer review approaches used in the biomedical journals. This idea is being explored in the context of Supercourse, a library of 2,350 prevention lectures, shared for free by faculty members from over 150 countries. Here we examine the issues relating to the use of the *Ama-*

zon.com type model for quality control and continuous quality improvement of educational materials on the Internet. A peer review system in the area of scientific publications and grant proposals represents a form of quality control. However, it has been criticized because of high cost, low throughput, and lack of information on valid measuring of quality (2,3). Many journals in small countries had financial problems despite receiving governmental or other support (4). Finding cheaper alternatives to measuring quality of scientific publication is crucial for the small scientific communities and biomedical journals around the globe.

Peer Review Background

Quality control has been used in academia for many years, mainly to attempt to control the quality of publications, books, and research proposals. One presumed form of academic qual-

ity control is peer review. Despite the popularity of peer review in the past 200 years, there is little hard evidence that peer review improves the quality of published biomedical research. Moreover, the validity of the process itself is in question (5). The traditional peer review process has been implicated in the significant delay between the completion of the research and its actual publication, especially for studies with negative results (6). Not only is the system costly, but often it is unable to detect fraud (7). Leading biomedical journals, such as *The Lancet*, are very strict towards the authors and aim to reject the manuscripts rather than encourage the authors to publish (8). Although peer review process is a very popular form of quality control, there are other alternatives for controlling the quality of publications, such as the open user-driven review system used in *Amazon.com*.

Internet as New Milieu of Research Communications

Introduction of the Internet technologies into the biomedical research and other fields of science in the early 1990's challenged the role of the traditional research communications paradigms. Instead of going through peer reviewed journals, a number of scientists and instructors harness the power of the Internet to share their scientific discoveries and educational materials (9). With the amount of materials currently available on the Internet, traditional forms of peer review are becoming more and more difficult to implement for both logistical and cost issues. Most of the 5 million educational lectures on the Internet have zero quality control, which raises many concerns among the users of public health and medical websites. Research communication on the Internet requires new models of speedy and cheap tools, able to adapt to continuously evolving nature of the Internet environment as well as the explosive growth.

Emerging Trend in Quality Control: Quality Control of the Reviewer

In the field of book sales, with *Amazon.com* new and successful forms of Quality Control initiated by the user have been born. *Amazon.com* faces many of the same issues as we scientists with an enormous information load and the need for speedy, accurate Quality Control. *Ama-*

zon.com is a model of a thriving, efficient, constantly evolving Internet information broker with very high utility and huge book catalogues (10). *Amazon.com* system is quite different than scientific peer review. It is based upon a five-point Likert scale questionnaires, supplemented with reviewers comments. It is very similar to other quality control approaches used by eBay, Consumers' Reports, restaurant ratings, and PC magazine. It is a very effective post-review system where the reviews are posted after the books are posted.

In *Amazon.com*, reviewers have been divided into following categories: editorial reviewers (those associated with *Amazon.com*), customer, and spotlight reviewers (Fig. 1). A reviewer becomes a spotlight reviewer by a form of popularity test. At the end of each posted review, readers are asked to vote, "Was this content helpful to you?" Reviewers who receive a sufficient number of "yes" votes are promoted to the category of spotlight reviewer and their reviews are given prominence. Thus, *Amazon.com* is reinforcing reviewers to provide helpful information in their feedback. Whereas traditional peer review process is only assessing the quality of materials, *Amazon.com* system makes inferences about the quality of both materials and the reviewers themselves. We have suggested that *Amazon.com* system could be used in the area of quality control of materials on the Internet, offering an attractive alternative to peer review mechanisms.

Similarities between Amazon.com Model and Supercourse

Similar model is used in the Global Health Network Supercourse. Supercourse is an Internet-based library of over 2,350 lectures on prevention, shared for free by over 30,000 members of the Global Health Network (11). The primary target of the Supercourse is the educator, with the philosophy that prevention education world wide can be improved through supplying educators with high quality lectures. The Supercourse has a post-review process in which an evaluation form appears at the end of PowerPoint lectures, virtually identical to *Amazon.com*'s or Consumers' Reports. The Supercourse project is leading one of the first efforts to establish quality control mechanism for Internet-based lectures. We compared the review trends in the Supercourse and *Amazon.com* and we found surprisingly simi-

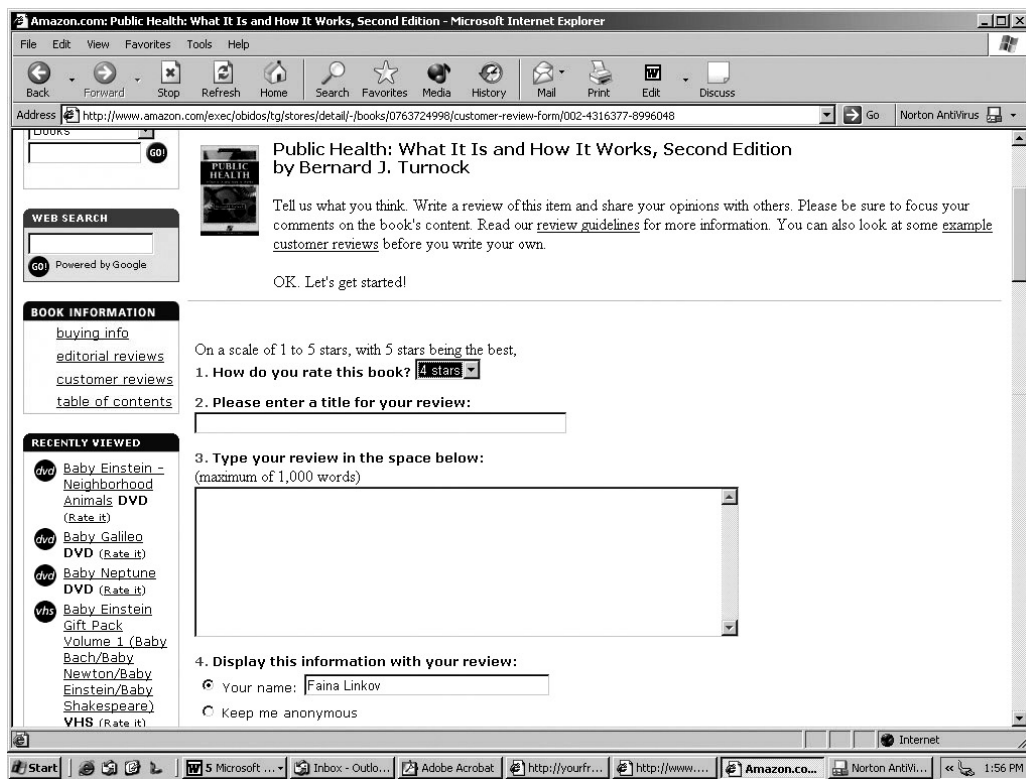


Figure 1. Amazon.com book review form.

lar patterns (Table 1). Overall, approximately 40% of materials undergo review process, with older materials (published less than 1 year ago) having fewer reviews (Table 1). Not unexpectedly, it seems that the books and the lectures that are not rated are those that are not used or read very much.

Table 1. Percentage of publications in the area of public health reviewed in Amazon.com and Supercourse

Internet source (website)	Reviewed publications (%)	Reviewed materials published <1 year ago
Supercourse (www.pitt.edu/~super1)	40.0	12.0
Amazon.com (www.Amazon.com)	48.0	12.0

A skeptic may criticize both the Amazon.com and the Supercourse approach on the grounds that there is a significant number of materials that do not undergo a review process. This criticism could be addressed by evaluating the number of articles in the *BMJ* and other leading biomedical journals that never undergo peer review process. To our knowledge and based on the personal discussions with the editors, half of the

articles submitted to the *BMJ* and other leading biomedical journals are rejected "in house" by junior editors who are typically not "peers," meaning that these articles are rejected without undergoing peer review process. It is of interest that few journals report what percentage of articles are ever peer reviewed. In all probability, for most major journals it is less than 50%.

Quality Control or Continuous Quality Improvement? Future Directions

The possibility of conducting quality control of research materials entirely online is an attractive feature but relatively unexplored biomedical application of the Internet. An estimated cost of traditional peer review of an article is between US\$400 and US\$1,600 (12), whereas the cost of reviewing books and other materials online is virtually free. Web-based statistical quality control can become successful and offer an enticing alternative to peer review systems in various biomedical journals, especially in countries that are searching for cheaper alternatives to peer review.

It can also open the doors to continuous quality improvement mechanisms for educational materials, similar to continuous quality improvement in the industry. We are in many ways in the position that manufacturing was 100 years ago. For both, there was not proven quality control system. Industry forged ahead to find new and better means of quality control. Science has not, until now. Public health professionals must be active in improving quality of their work (13) and search for new alternatives for cost effective quality control mechanisms. Quality improvement activities require constant planning and perseverance, explicit standards of good practice, quantitative measurement, and comparison with previous performance or the performance of others (14). The advantages of using new approaches and alternatives to peer review need to be further explored and investigated. There is a need for evidence-based quality control and continuous quality improvement mechanisms for both traditional paper journals and Internet materials. We need to start testing and comparing existing peer review approaches and novel systems, such as *Amazon.com* model. Moving away from peer review system and publishing all studies online would be one of the alternatives worth investigating.

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