Exploratory study of quality control mechanism for academic papers in the Internet era: A case study of Sciencepaper Online in China

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Abstract

Information and communication technologies such as the Internet can both challenge traditional ways and open opportunities for solving existent problems of present academic quality assurance system. Sciencepaper Online in China (CSPO) has adopted a sophisticated mechanism for quality controlling, which can be represented by "Publish Online First, Author Selected Peer-Review Later". Using a five-star rating system for quality labelling, each reviewed paper will be assigned a one to five star grade label, corresponding with Poor, Fair, Good, Very Good, and Excellent. With this system, CSPO innovatively solves the conflict between rapid publication and quality assurance. This paper investigates this unique quality mechanism with the aim to understand its operation more thoroughly and evaluate its value to the scientific communication community.

Keywords: Sciencepaper Online; quality labelling; quality control; academic paper

1. General Background

New technologies such as the Internet enable new publication models for academic papers. The ways scientists share and use research results are

changing rapidly, fundamentally and irreversibly [1]. Information and communication technologies can both challenge traditional ways and open remedies for existent problems of present academic quality assurance system. New forms of ex-ante and of ex-post quality control may partly replace and partly amend peer review. Open peer review, online commenting, rating, access counts and use tracking are also potential contributors [2].

Current development of 'open' movements, including Open-access, Open-data, and Open-science has evolved from only coping with the serials crisis into reflection and re-engineering of the entire scholarly communication processes. Scholarly publishing mainly comprises four functions: registration to establish intellectual priority, certification to certify the quality/validity of the research, awareness to assure accessibility of research and archiving to preserve research for future use. Convergence of technologies enables new business models for scholarly communication. A variety of business models can be explored with the four core functions disentangled or recombined [3].

Traditional academic journals are switching or have switched to Internet platforms to facilitate the reviewing and editing process, thus to shorten the time for papers to reach their readers. But, fundamentally, most online journals are simply digital editions of their print analogs [1]. They still use the traditional subscription-based business model without overcoming all the inherent access-limiting drawbacks of traditional journals.

Golden OA journals eliminate the access barrier. But most of them still use traditional forms of peer review. Some have begun to use innovative new forms that take advantage of the new medium and the interactive network joining scholars to one another. One example is PLoS's light-touch peer review. The truly radical thing about PLoS ONE is that it has redefined the nature of peer review. Using this 'light touch' refereeing process, the only criterion for publication is that a paper is methodologically sound. So the time for a paper to appear on the web or PubMed repositories will be shortened into two to four weeks. Although there are many debates about this light-touch refereeing method, PLoS ONE has made a success with this disruptive business model. Peter Suber said that 'removing access barriers and reforming peer review are independent projects' [4], which is right in concept level. However, the case of PLoS ONE indicates that they can be combined to bring more benefits to the academic arena. Leo Waaijers even suggests in Ariadne that funders should fund research on alternative "non-proprietary peer review" services [5].

2. Introduction of Sciencepaper Online

There are also pioneers in the scientific communication area in China, and Sciencepaper Online (CSPO) is the most aggressive one, which integrates the concepts and implementations of preprint repository, open access journals, and coalition of institutional repositories into one platform. CSPO is sponsored and operated by the Center for Science and Technology Development (CSTD) of the Ministry of Education (MOE) with strong financial support from the government.

CSPO offers an online publication platform for new and innovative ideas to the academic community with the aim to facilitate fast exchanges and instant adoption of new academic achievements. It also serves as an important platform for the optimization of academic environments and for the improvement of academic behaviors [6].

CSPO will accept and publish any papers that meet its basic format requirements for online publication in one week after the submission, no publishing fee needed. It bypasses traditional publication procedures such as ex-ante peer reviews, revisions, editing and printing. CSPO does not hold any copyright of any paper, the copyright still belongs to the author, and it allows and encourages authors to submit the paper to other professional journals.

CSPO has begun operation formally since August, 2003. By the end of March 2010, it has more than 200,000 registered (which is free) users, with daily IP visits about 10,000. The number of total papers published is about 41,000, and this number increases steadily about 1,000 per month. (See Fig. 1)

The operator, CSTD, also plays as a funder and a government agency, which greatly helps the operation of CSPO. For example, it requires that all projects funded by the Doctoral Program of MOE must publish 1-2 original papers on Sciencepaper Online. In addition, as a funder and government agency, it has an expert database, including all the doctoral advisors in China. This provides strong support for its peer review and quality control system.

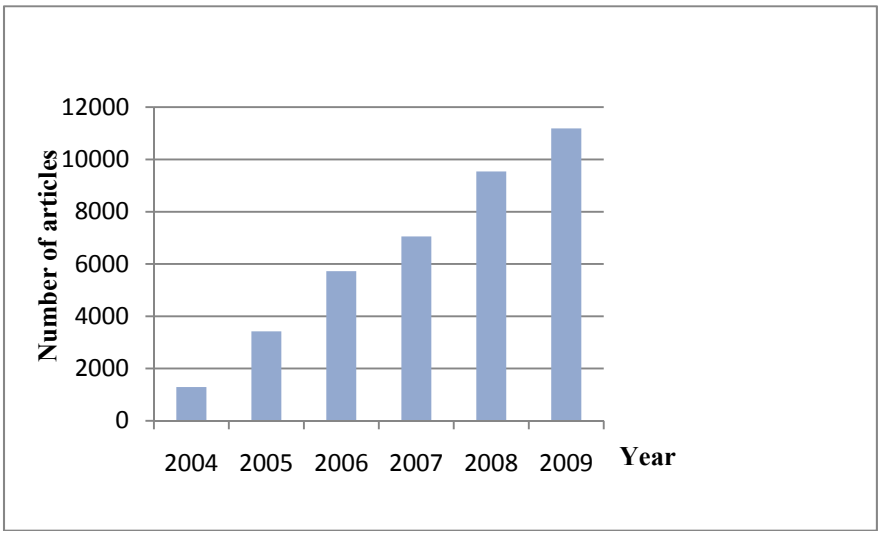

Figure 1: Annual published articles on Sciencepaper Online

3. Unique quality mechanism

Sciencepaper Online offers a fast and real-time platform for exchanging new academic ideas and disseminating new academic achievements. In this aspect, Sciencepaper Online acts much like a preprint repository, or archive. In addition, CSPO also provides an opportunity to publish scientific content that would not be accepted in a traditional journal.

However, quality control mechanism is essential for academic papers to have real value to the scientific community. So CSPO adopts a sophisticated mechanism for quality controlling, which can be represented by "Publish Online First, Author Selected Peer-Review Later" since Oct. 2005.

When a paper is submitted to the site, its author can select whether they want formal peer review services (free). The paper, waiting for peer review upon its author's request, will appear first on the site with a "waiting for review label" along its side. Reviewers will evaluate the paper around several aspects, including Title, Chinese and English abstracts, scientific innovativity and originality, rationality of the research plan, methodology of data processing and bibliometric references (See Table 1).

Table 1: Review Criteria

Criteria	Options				Note
Title	Very Good	Good	Fair	Poor	Appropriate with content
Abstract (Chinese)	Very Good	Good	Fair	Poor	Terse and Concise
Abstract (English)	Very Good	Good	Fair	Poor	Terse and Concise
Scientific Innovativitiy	Very High	High	Some	No	For review articles, this will be academic value.
Research Plan	Very Good	Good	Fair	Poor	For review articles, this will be coverage of references.
Data processing and Reasoning	Very Good	Good	Fair	Poor	For review articles, this will be logic deduction and proof.
Written expression	Very Good	Good	Fair	Poor	Clear and formal
References	Very Good	Good	Fair	Poor	Comprehensive and concise
Overall Review Suggestion	Suggest to pub. with priority	Agree to pub.	Need minor mod.	Much mod. needed	Not pub.
Specific suggestions	(No less than 50 words)				

mod. = modification pub.=publish

CSPO uses a five-star rating system for quality labelling. According the final comprehensive peer evaluation results generated from the reviewing process, each reviewed paper will be assigned a one to five star grade label, corresponding to Poor, Fair, Good, Very Good, and Excellent, respectively. The final reviewing commentary will also appear alongside the paper without the name of the reviewer to ensure that reviewers can criticize openly without the danger that the author would know the originator and be resentful [2]. Furthermore, CSPO also permits registered users to comment on all published papers, encouraging academic criticism and discussion with the aim to evaluate the real academic value of a paper more objectively.

4. Data analysis and discussion

The "Author-selected peer-review after publishing online" method started from October 2005 as an effort to make papers published on CSPO to be accepted by the academic community. Appropriately-arranged peer-review can encourage academic communication, including critics and discussions around sumitted papers. By the end of March 2010, CSPO has published about 41,000 originated articles, among which about 88 percent has selected peer-review. The high ratio reflects the fact that most authors are serious when submitting their articles to CSPO. They want to demonstrate academic values of their articles.

For all peer-reviewed articles, the proportion of different star levels, are 13, 34, 19, 18, and 16 percent for one to five stars, respectively. Because only articles with 3 stars or higher level have the the opportunity to be recognized as eligible academic papers, so we can consider the rejection rate of CSPO is about 36 percent, which is not very high. Now, only 35 universities and/or research institutes consider papers published on CSPO as eligible academic papers for tenure, promotion, and/or graduation purpose. So, only a little fraction of high-rating papers can be formally treated and brought actual impact to their authors.

CSTD, the operator of CSPO, started to publish a traditional journal *Sciencepaper Online* (ISSN 1673-7180) since August 2006. The *Sciencepaper Online* journal is different from CSPO, but those best articles on CSPO, will be arranged to be re-published in this journal with priority. Since last year, CSTD started another journal, the *Sciencepaper Online Collections*, which only selects excellent articles from CSPO.

Due to time and other constraints, complete citation data for CSPO is not obtained. However, we found citation data for *Sciencepaper Online* journal from one of the most widely used database –China National Knowledge Infrastructure (CNKI). There are only 74 articles with non-zero citations for this journal, and the largest number of citations for a single article is only 5.

These data indicate that the quality of articles published on *Sciencepaper Online* journal and on CSPO site need to be improved. Of course, the lack of an OAI-compliant interface may also be one of the reasons for its low impact, because readers or academics can't use popular search engines, i.e., Google Scholar, to find most articles on CSPO.

As said above, China Sciencepaper Online is sponsored and operated by a government affiliate, the Center for Science and Technology Development (CSTD) of the Ministry of Education (MOE). Because its inherent non-commercial and non-profit nature, CSPO does not charge authors for

publishing, and even pay a little fee to reviewers. This makes it very different from other new publishers in the western world, such as PLoS. For example, PLoS ONE uses light-touch peer-review, mainly to cope with its sustainability problem, in other words, to attract more authors to publish in it and earn more author-paid fees.

Another reason for its low impact may arise from its wide discipline coverage. Academics usually read a few journals focusing on their disciplines, or use search engines for initial literature investigation in their study. Coverage being too-wide and the lack of indexing by search engines means fewer readers and users, resulting in low academic impact.

5. Conclusion

Through its "Publish Online First, Author Selected Peer-Review Later" method and five-star quality labelling system, Sciencepaper Online innovatively solves the conflict between rapid publication and quality assurance. Since quality control is so important for academic papers, further in-depth investigation about this unique quality mechanism and its long-term impact will tell more about the nature and changes of scientific communication in the Internet era.

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