Access, accommodation, and science: Knowledge in an “open” world

by Ashley Rose Kelly and Meagan Kittle Autry

Abstract

The rising popularity of open access (OA) publishing in scholarly communities is purportedly leading to increased public access to knowledge. This is especially true for discussions of scientific research. However, we argue that while there have been significant moves to provide better material or technological access to research, OA advocates must still tackle the issue of making original scientific research articles conceptually accessible to broader publics. Despite being freely available on the Web, research articles are not by default linguistically or conceptually accessible to the global public(s) they are partially intended to reach with the move to OA. In this paper we examine how OA, coupled with innovative scientific communication practices, can help align the ideals of OA with the realities of complex, specialized genres of writing to provide better, more “open,” access to research. We look to *PLOS ONE* and the PLOS Blog Network to consider how material access coupled with communication strategies developed by bloggers can work together toward more openly accessible original scientific research articles.

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Introduction

“Our mission is to accelerate progress in science and medicine by leading a transformation in research communication. Every article that we publish is open-access — freely available online for anyone to use.” — “Welcome to PLOS,” PLOS.org

As early adopters of the Web (Castells, 2001), scientists have been quick to explore the affordances of new technologies that might aid their research. One technological change taken up was the move to online publishing, offering articles immediately without their physical print form to researchers around the globe. In this model, researchers typically had access through a university or professional organization via subscription to a given journal. However, prohibitive costs of journal subscriptions and the reimagining of scholarly publication more generally have led to a new model of sharing research online: open access (OA). OA is an increasingly popular method for distributing the findings of scientific research. The general principles of open access are to provide original research articles to anyone with Web access free of charge for download, reading, remix, and redistribution [1]. This model of providing publicly accessible research is often achieved by licensing the material under a Creative Commons license (Lessig, 2001) [2]. The justifications for the shift to open access are plentiful and have already been covered in this journal (Ulrich, 2010), including the economic impacts of the open movement in general on scholarship, software, and science (Willinsky, 2005) and the complexities of moving to OA for a wide range of scholars and other groups (Papin-Ramcharan and Dawe, 2006; Borrero, *et al.*, 2007). Advocates of OA often advance a moral position as well. Parry (2012) argues, “The exchange of information is fundamental for knowledge creation

and social progress ... Without knowledge transfer, inequalities quickly form, and political and economic power is rapidly concentrated in the few at the expense of the public." The argument follows that a smart, informed democracy can only progress when information is open and available to everyone. We have an obligation to reach everyone with the information we are publishing, with the knowledge we are creating. And the OA movement is well on its way to doing just that: a recent study found that the number of journal articles published OA has increased annually around 30 percent (Laakso, *et al.*, 2011), and the *Directory of Open Access Journals (DOAJ)* now lists over 8,200 OA journals across all scholarly disciplines, with nearly 3,000 of these being in the sciences [3].

While OA is an important change to the distribution of scientific publications and deserves a great deal of praise, we must cautiously assess its influence on the communication of scientific *knowledge*. Specifically, we argue that technology *access* should not be conflated with what is conceptually *accessible*. In this paper, we examine the concept of open access publication of original scientific research articles to better distinguish between the notions of technical or material access and conceptual access. To do so, we look to rhetorician Jeanne Fahnestock's (1986) account of accommodating results and discussions of scientific research for different audiences. She traces the movement of scientific knowledge from expert to non-expert audiences and genres [4]. What happens to scientific knowledge as it moves across these two spheres of discourse? We then look to the immensely successful Public Library of Science (PLOS), which publishes seven open access journals in the sciences and has become one of the premier open access publishers for scientific research, as a case study. We find that *PLOS ONE* still largely follows a traditional model of scientific communication of original research. That is the access is provided technologically or materially, not so much conceptually. However, we see promise in another PLOS initiative, the PLOS Blog Network, and suggest that a synthesis of the strategies offered through these two platforms and efforts moves toward more openly accessible scientific research — both materially and conceptually.

Open Access and the Open Movement

We see the definition of "access" as one matter to be addressed within the OA movement. In doing so, we partially reprise an argument from the world of software development. Free software advocate Richard M. Stallman (2007) takes up the question of using the "open source" label to describe software and the problematic nature of "open." Stallman provides an example of how the term "open" software can mislead because of the common English usage. Author Neal Stephenson, Stallman says, incorrectly defines "open source" with the following description of the free software operating system GNU/Linux: "Linux is 'open source' software meaning, simply, that anyone can get copies of its source code files" [5]. This is wrong, Stallman would tell us. Stephenson's error is likely an innocent mistake presuming a shared meaning of the word "open," but it is still a mistaken account. What's the problem? The ambiguity of the term "open," which has a more specific meaning in software studies that outlines the following criteria for "open source": free redistribution, access to the code, allowance of derived work, integrity of code, no discrimination of peoples or "fields of endeavor," and several other criteria found in the Open Source Initiative's definition (Open Source Initiative, n.d.). Stallman makes the case for his preferred term, "free software," [6] but his concerns about misusing the term "open" transfer to questions of "open access." "Open access," like "open source," is broadly and inconsistently applied to varying methods of distribution and allowances for redistribution. The landscape of open access is muddled with terms such as "gold OA," "green OA," "libre OA" and more. These qualifications suggest that there might be some discomfort with the idea of openly sharing and freely redistributing the products of our intellectual labors. Further complicating the use of "open" is some sense of shallowness in the term. For example, there are the currently contentious discussions about open educational resources called MOOCs (Massive Open Online Courses) (Stommel, 2012; Porreca, 2013; Tilsley, 2013). There are also those advocating and considering more nuanced models of open education and how those will help non-traditional learners participate (D'Antoni, 2009; McAndrew, 2010). Here the contention lies between instructors invested in pedagogical research and practices and the economic and political pressures to "streamline" post-secondary education.

Just what is "open" is up for debate. Just what is "open?" What can users "access?" What do these words mean together? The worlds of software development and education are grappling with these important questions, as is the scientific community. While the scientific community is also engaged in discussions of open science and open notebook keeping, we will focus here on the matter of publishing. As we have argued, open is a term fraught with ambiguity, but it is not the only problematic term in OA scientific publishing. Access is equally deserving of careful attention. Thus, we wish to examine how the term "access" provides a misleading account of what sharing scientific texts freely online accomplishes [7]. Specifically, we argue that OA publications are still largely closed and inaccessible because they model the traditional scientific research article genre. While the availability of original scientific research online allows for certain audiences to download and read the content, there are many questions that move beyond questions of technology use into questions of

communication practices. Once readers have an OA document, how can they use the information? In what ways are they still limited by the traditional structure of the original research report in the sciences (or really, any other scholarly discipline)? We are especially concerned with non-expert use of these freely available texts.

Like the word open, access causes some confusion or conflation of ideas. For example, Borrero, *et al.* (2007) argue that open access for rice researchers and producers in Asia at the point in time of their research means having all rice research data available both online and in printed form in order to reach all of their audience, many who do not have Web access. However, they do not account for the fact that even if the farmers in rural areas are able to obtain this information in hard copy form, they may not be able to use the information if it is not written in a comprehensible way, for many of them are of average or below average literacy. Thus, in the instance of Borrero, *et al.*'s rice research initiative, having the right infrastructure to reach their audience is only part of the access equation. Even if the information is open in the right way for their readers, what can a rice farmer do with a scientific research report? All of these definitions that these scholars have offered, and all of their accounts of the information available for opening scholarship are crucial and on point. However, original research articles are still written in a style that will only allow a highly specialized audience to decode them; we cannot take open access in its current format as the end. There is still much work to be done in the accommodation of this information and knowledge for non-expert audiences so that they can use it to the full potential that open access proponents imagine. We now turn to a critical work in the rhetoric of science that can help us understand the next steps that scientists and other scholars should consider for the future of OA journal article publication.

Accommodating science

In her now canonical article "Accommodating science," Fahnestock (1986) explains the function of scientific accommodations, or when original scientific research articles are adapted for non-expert or "popular" publications like newspapers or magazines. These accommodations are like "adaptations," she says, of scientific information designed specifically for "noninitiated audiences" [8]. In these adaptations of scientific research some adjustments must be made before the arguments can be usefully presented to a non-expert audience. Fahnestock's observations are first concerned with a change in genre. Her account of genre is situated in the Aristotelian tradition. There are three major genres, each concerned with different situations, audiences, and ends, and they are forensic, deliberative, and epideictic. Aristotle tells us that each has particular temporal affinities, with forensic concerning the past, deliberative the future, and epideictic the present. Fahnestock argues that scientific research reports are written in forensic style, with authors are making a case for their methodological decisions and their results. That is, they write about what they have already done. An expectation of the scientific audience is that they understand the importance of the documented methodological decisions and the significance of the findings. Rarely do scientific research articles herald findings. The audience understands the significance, and no one wants to risk overstating their claims. What happens when this research is moved toward a more general audience? Reports of scientific research packages for popular audiences are made possible by a genre shift to the epideictic, there "to celebrate rather than validate" [9]. This is because to an audience of non-experts — the "general public," say — the immediate significance of an original scientific research report may not be clear. Part of the trick in accommodating, then, is to highlight and emphasize the significance of the research — to herald findings.

Moving from one genre to another also causes some changes to the information contained within each, Fahnestock (1986) tells us. This is not, she reminds us, "simply a matter of translating technical jargon into non-technical equivalents" [10]. Instead, changes to the rhetorical appeals made in an article are part of the accommodations for the new audience. For example, a writer could appeal to the "wonder" of a topic [11]. Why is this research important or interesting, generally? Looking at the degrees of certainty asserted, Fahnestock finds that there is significantly more in the popularizations. Finally, turning to rhetorical stasis, Fahnestock argues that the "rhetorical life" of a scientific observation can be traced as it moves through different stasis. In rhetorical theory, these stasis points act in a hierarchical order, establishing first existence of questions about what to do with such information or findings [12]. She argues that the rhetorical work of acknowledging different audiences, exigencies, and purposes across expert and non-expert discourses in the sciences requires accommodating, not simply "translating," the scientific knowledge and information [13]. Since the specialized world of scientific discourses limits linguistic and conceptual access to the knowledge practices and knowledge generated therein, questions about what non-experts are indeed able to "access" become relevant.

The rhetorical life of scientific facts and texts has changed and continues to change since Fahnestock's accommodation essay was published almost 27 years ago. In the late 1980s the Web was a fledgling technology, but by the late 90s it had gained significant traction. So when a reprint of Fahnestock's article appeared some 12 years after its original publication, Fahnestock (1998) made

some brief remarks about the concerns of her original paper. She acknowledges “the impact of science reporting on public deliberation,” and more than a decade after its original publication that “[t]hese concerns have, if anything, increased (e.g., the campaign on global warming), warranting continued investigation of the gap between the public’s right to know and the public’s ability to understand” [14]. We agree and believe that the current discussions of the merits of open access are an integral part of this important discussion about the distinction we are making between a user’s ability to *obtain* and a user’s ability to *understand* and use scientific and other scholarly research. We now turn to our case study to explain how we can move closer to truly open access to scientific research.

Accommodating and access: *PLOS ONE* and the PLOS Blog Network

To illustrate the distinctions that we are making between what is technical or material access and what is conceptually accessible in original research and publications about original research, we look to the popular general scientific open access publication, *PLOS ONE*. *PLOS ONE* began in 2006 and is PLOS’s most prolific publication, featuring original research reports from any scientific discipline. In 2012, *PLOS ONE* published a record 23,463 articles (Hoff, 2013) with the help of over 60,000 peer reviewers, also a record for the journal (Somphanith, 2013). The journal maintains an average acceptance rate of 69 percent [15] (PLOS, 2013). PLOS’s influence on science publishing will continue to grow in the years to come as it has established a viable and influential model for open access publishing. In this model, authors pay a standard publication fee based on their country of research, which for researchers in the United States currently stands at US\$1,350. It also offers a fee waiver for authors who are unable to pay the processing fee.

Because of the popularity of PLOS, its mandate, and its innovative approaches, it is a particularly useful site of inquiry to examine in terms of accommodation. This site allows us to explore questions of open access publication technologies and platforms as well as the strategy behind them. Further, in the attempt to share information with *anyone*, the relationship between material access and conceptual access can be explored. Looking to PLOS’s own project descriptions, we outline the interests and strategies used to make original scientific research open on *PLOS ONE*. After discussing the statements made by PLOS, we will problematize the distinction between kinds of access in turn. Then, we look to the efforts of the PLOS Blog Network to make this same original scientific research conceptually *accessible*.

“Why publish with *PLOS ONE*?”

In the author information section of its Web site, *PLOS ONE* makes several arguments for choosing its journal as an outlet for scientific research. First and foremost, it emphasizes the most crucial information for academics: that the journal adheres to the highest publication standards to ensure quality work. This involves several elements, including “fair, rigorous peer review” and a “prestigious editorial board,” which are primary concerns for authors who need their research published in a quality journal for it count toward tenure or promotion [16]. It also highlights the fact that authors can retain copyright of their work, demonstrating fair character editorially and a good relationship with authors. PLOS additionally emphasizes what it can do for authors, pointing out the rapid publication timeline as well as the journal’s efforts to track usage statistics of published research and to promote published work through its blog network and popular news outlets. Overall, a significant portion of this page speaks to academic concerns: PLOS will publish work quickly for tenure purposes, and then it will track the impact of the research. *PLOS ONE* recognizes that the impact of research often goes beyond academia to popular publications such as the *New York Times*. While the reach of the research might go well beyond the original article, and that impact beyond academia is important, the focus remains internal. The original scientific research article should first report scientific research to a scientific community. Fair enough, but the goal is to broaden the reach of the research, then the process that follows should be considered. At this point, we still see the broader impacts are an afterthought, and that the process of academic reviewing and publication for the original research article is not dramatically changed in this model of distribution.

“Publication criteria”

PLOS ONE has seven main criteria for publication in its journal, which is outlined specifically at the top of the page [17]. The page then breaks down each criterion with some detail. In describing the first criterion of submitting original scientific research articles, the journal emphasizes that it is not interested in other genres, such as reviews, case studies, commentaries, opinion pieces, or other forms of “secondary literature.” Original scientific research should be just that — original, not published elsewhere. It should be held to high disciplinary standards with good detail, especially in the methods. Perhaps most interesting to the discussion here, the guidelines remind authors that conclusions should be “presented in an appropriate fashion and are supported by the data” [18]. All of these criteria imply some prior genre knowledge on the part of the researchers in the discipline for how methods sections should be written, or the appropriate format for results, though the journal

does not provide any exact detail.

Put another way, this section outlines the rhetorical moves made to write into the genre of an original research article. It describes the kind of writing PLOS expects. Writing original scientific research articles is not, it seems, dramatically altered by the OA model. Instead, we see that the kind of text to be published might just as easily fit into a traditional journal only available through a paywall. Or, recalling the plight of researchers some decades ago, a print journal. In this particular discussion of publication criteria, there is good evidence of where the conventions of the original scientific report remain.

"Editorial policies"

Divided into eight major sections, the "Editorial policies" page outlines the ethical and legal policies and agreements between PLOS and its authors [19]. Most of the page is fairly standard academic fare, such as declaring competing interests or outlining what constitutes authorship. In a gesture toward their open policies, the organization requires that study conclusions cannot be based solely on proprietary data but must also be verifiable with publicly available data. This page also communicates the journal's policy that authors license their work with Creative Commons, suggesting that authors use the very open CC-BY license. Similarly, images and other inclusions in an article must be CC licensed. It justifies this choice by saying that open licensing "ensures that the article will be available as widely as possible and that the article can be included in any scientific archive" [20].

Again, we see the focus on technical and legal concerns for making information available. Recalling Stallman's (2007) argument that "open source" misleads because it suggests merely "readable source code," here "open access" misleads because it suggests that technical, material and legal access makes a text wholly accessible. Overlooking the obvious problems in assuming global technological access, as well as technical and legal intersections used to censor information, there is yet another range of issues raised when we begin to ask questions about the conceptual accessibility of these articles. Barring even matters of translation — necessitated by linguistic diversity — we might ask questions about native speakers' of English linguistic competence, their scientific literacy, their academic literacy, their technical literacies, and so on. What Fahnestock shows us is that, even in articles that fall within traditional journals, there must be a significant amount of rhetorical work to make the information conceptually accessible — to accommodate to the different audiences.

Peer review

Peer review is currently essential to the vetting of scientific research. When a publication is submitted to *PLOS ONE*, it goes through a number of different hands. Initially, the submission is reviewed to ensure it meets the basic *PLOS ONE* criteria, and if it does, it is sent on to an "Academic Editor," who further evaluates the submission for its technical and methodological soundness. If the submission is sound, it will be sent out to peer reviewers. The "Academic Editor" will make the ultimate decision based on these reviews, choosing from four possible outcomes: "Accept," "Minor revision," "Major revision," and "Reject" [21].

Reviewers are instructed to evaluate the article for its technical and methodological soundness and assist the author with developing their manuscript, as most peer review is designed to do. However, *PLOS ONE* reviewers are directed to avoid claims about the "importance" of the article's contributions. Instead, the importance is left up to the larger community who will be able to "discuss and evaluation the significance of the article (through the number of citations it attracts; the downloads it achieves; the media and blog coverage it receives; and the post-publication Notes, Comments, and Ratings that it receives on *PLOS ONE*, etc.)" [22]. Since the editors and reviewers are not charged with determining "importance" in the same way an academic journal editor traditionally would, the journal aims to let a broader audience consider the promise of research. Certainly this is an interesting move toward opening up research. Yet, Fahnestock might remind us, much of the work done in accommodating helps non-experts understand the relevance of research to their own lives. What *PLOS ONE* offers is an opportunity for experts — and in-experts or near-experts, such as specialized science writers — to make some assessment about the merit or importance of research. What is taken up in blogs or the popular press, however, may still not be in the public's interest or a public's interest, unless the research is accommodated to that audience. Put another, what is the public's interest in the research might not be the same as the researchers or a journalist/blogger. If the broader public(s) cannot understand an article well enough to begin learning more, they have no position from which to make a decision to learn more about the research. They are subject to the decisions of those who can understand and "translate" or accommodate research.

Furthermore, not just any reader will have the tacit knowledge to come along and understand the relevance of each article and what might interest their particular communities without some intermediary form of accommodation being offered. How will they come to understand technical jargon? How might they understand the importance of certain methods? Even grassroots citizen scientists would often be at some pains to take some original research article and determine its relevance to their work. Certainly there are cases where they could, where the "general public" could take the time to begin to learn about some area, but obtaining such expertise is time-consuming.

Are there alternative ways to present the information so that these good efforts to make the research open and freely accessible — downloaded — also more conceptually accessible? Are there ways to accommodate the wider range of audiences outlined as determining the relevance of scientific research? Following the peer review model's logic, it would certainly seem to behoove researchers to think about strategies to accommodate audiences in the original research article to increase the likelihood of uptake across blogs and the popular press.

Formatting guidelines

Guidelines are covered on three pages: "Manuscript guidelines," "Figure and table guidelines," and "Supporting information guidelines." The guidelines for sections generally follow a traditional original research article structure, IMRaD. This format refers to the typical Introduction, Methods, Results, and Discussion sections that comprise a scientific research article (Swales, 1990). While *PLOS ONE* prescribes certain arguments that need to be made within the article, such as an account of the method and some discussion, but it does not prescribe a typical structure, such as IMRaD. The genre it is looking for, then, is detailed in traditional and expected ways for the scientific communities, but does not necessarily have to look exactly as may be expected (though it seems to be highly suggested). It also incorporates guidelines for special cases of research and ethical guidelines for them, such as clinical trials. Figure and table guidelines detail the technical and design specification for including such items in the article. The guidelines for supporting information are also concerned with technical information, but it is important to note that affordances of these technologies mean a range of possibilities for the range of data and supporting information that can accompany an original research article.

PLOS Blog Network

Writers of blogs on the PLOS network are described as "writers who love science and medicine, and scientists and physicians that love to write" [23]. All of these writers might be called bloggers and they work to make scientific research conceptually accessible to wide audiences of both experts and non-experts. Specifically, the shared mandate of the bloggers, as described by PLOS, is to "promote greater understanding of breakthrough science for a variety of reader types, including policy makers, the academic science community, researchers, medical and mental health practitioners, journalists and the general public" [24]. We suggest in the work done here is an avenue for OA publications to become more truly accessible. Dividing out the communication strategies of bloggers from the shape of the original research article is a disservice to affordances offered by the OA model of publishing.

In using the same kinds of technologies supporting the OA model, PLOS blogging takes up many of the affordances of and responds to the exigencies of the scientific community. Put another way, OA affords the possibility of truly accessible — technologically, legally, and conceptually — original scientific research. There is an exigence to share this research with the public so that they better understand the values of scientific research, might benefit from the research, and continue to engage with this important human enterprise. Opening up scientific knowledge requires, at least, all three elements: technological availability, legal sharing, and accommodation. Bloggers, particularly those writing for PLOS, but also *Scientific American* and similar publications, offer good models of scientific accommodation that might be taken up in the original research article. Rhetorical conventions shape the genre, not pre-ordained structures, and a wholly new model of dissemination provides new audiences and exigencies to which we might rhetorically respond.

Conclusion

Certainly a scientific research article being open access does not mean it is also conceptually *accessible*. The most brilliant scientific findings, written without an eye to the wider global audience these articles now have, remain inaccessible to most readers — the very readers the OA movement argues that ethically, we have an obligation to be reaching (Parry, 2012). Few, if any, outside of the narrow scientific specialization would be able to fully understand and appreciate the nuanced scientific findings now emancipated from the pages of a print journal. Elsewhere in the academy, research also shows that remix and revision rates in the creation of materials for Open Educational Resources, such as textbooks, are quite low (Hilton, *et al.*, 2012). If the scientific research being published is in open access journals or "translated" through OERs, we may still be missing significant potential audiences for this research.

What these problems gesture toward are the varied rhetorical situations to which different genres of science writing respond. As Fahnestock (1998) reminds us, "With a significant change in rhetorical situation comes a change in genre, and instead of simply reporting facts for a different audience, scientific accommodations are overwhelmingly epideictic; their main purpose is to celebrate rather than validate. And furthermore they must usually be explicit in their claims about the value of the scientific discoveries they pass along" [25]. Barring dramatic revision of the original research journal

article genre itself — perhaps to include non-specialist summaries of findings and more suggestive pronouncements of significance of claims — it seems that the OA movement in the sciences is largely for the interest of the scientific enterprise itself.

We argue that, in combination with OA and its related ideologies, the change in technologies, those facilitating OA, have provided an opportune moment for the scientific process to re-imagine the accommodated genres of science popularization. However, it is not just about accommodation (to use Fahnstock's terms). What we need, in a global knowledge economy, is a middle ground where articles report on original research but are also written in such a way that the general public can understand and potentially use the information. We cannot meet the OA movement's goal of having people build on research if they cannot understand it. This has an obvious application in the rise of citizen science. It is much easier for citizen science participants to build on research that they can not only access technologically, but also understand and put to use intellectually for the benefit of the communities they serve.

OA is not a movement or change in isolation. Facilitated by the Web, the open and rapid dissemination of peer-reviewed journal articles would see further and substantial changes. Drawing from values advanced in the much earlier open source software movements — populated by programmers, hackers, and philosophers — the OA movement necessarily, by way of its antecedent open source movement, is highly politicized and propelled by ideals to democratize knowledge. Information wants to be free. Clichés aside, OA offers up an opportunity for information to be free, but that alone does not bring us to its global accessibility. Information is free; knowledge is still controlled. How, then, does OA set the stage for changes in the accommodation of scientific information? By accommodating broader audiences from the initial publication in a scientific research journal, the opportunities for that article itself become more significant, with potentially more uptake, redistribution, reuse, and remixing.

Further discussions about the OA movement will include discussions of opening platforms, providing increased technological and material access, as well as conceptual access. Following the tragic death of OA advocate Aaron Swartz this January, many researchers began posting their research freely online. Twitter became a hub for sharing links to these publications, with the hashtag #pdftribute. However, this gesture reminded us of the complexity of what technologically "open" means. danah boyd, on the Association of Internet Researchers listserv, shared that Swartz, a friend of hers, hated PDFs because they were originally a proprietary technology and are not easily machine readable [26]. That is a technical matter. We offer a communication issue of accommodating. As the conversations mature and converge, the discussions may be framed in terms of "accommodating" or "knowledge transfer," but the OA movement certainly has the moral argument to move those to discussions of accommodating different audiences. Rather than approaching scientific communication to "general audiences" with the deficit model or models of "translating" in mind, the OA movement can advance a model that advocates for opening up research to multiple audiences. In these audiences, even in some of the "general public," there are sure to be not only consumers, but also users of this openly accessible information. Technical and conceptually accessible scientific research is where OA leads us, and we need only look to blending technical strategies in journals like *PLOS ONE* with the discursive and conceptual strategies of PLOS Blog Network as an example of how to lead the way.

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Notes

1. For a complete definition of open access, see: Leslie Chan, Darius Cuplinskas, Fred Friend, Yana Genova, Claude Guedon, Melissa Hagemann, Stevan Harnad, Rick Johnson, Rima Kupryte, Istvan Rev, Monika Segbert, Peter Suber, and Jan Velterop, 2002. "Budapest Open Access Initiative," at <http://www.opensocietyfoundations.org/openaccess/read>, accessed 2 January 2013.
2. There are numerous Creative Commons licenses that allow authors to choose different ways to distribute their work; for example, their work might be remixed or used for commercial distribution.
3. Inevitably, with any successful online platform or strategy, comes efforts to cash in on the popularity of open access publishing. These "predatory publishers" exploit scholarly publishing and engage in unethical practices, attempting to get authors to pay to publish their research in these new OA "journals." These predatory practices are tracked by Jeffery Beall, a librarian and faculty member at the University of Colorado, in an effort to keep the scholarly community informed and to minimize their impact on legitimate OA publishing.
4. We use genre in a specific sense here, referring to the rhetorical definition of genre as "typified rhetorical actions based in recurrent situations," meaning the kinds of texts that are employed within specific discourse communities (Miller, 1984, p. 159). For example, scientists write original research articles, grants, grant reports, lab notebooks, etc.
5. Quoted in Stallman, "Common Misunderstandings," paragraph 4. Stephenson wrote these lines in his essay "In the Beginning ... Was the Command Line" (1999). Published online at <http://www.cryptonomicon.com/beginning.html>.
6. Stallman would remind us that here "free" means "free" as in "'free speech,' not 'free beer'" (Stallman, paragraph 1).
7. Stallman has also discussed problems with the phrase "open access," preferring "redistributable publication," as found in the following "Conversation with Richard Stallman." Published online at <http://www.dancohen.org/2010/11/23/a-conversation-with-richard-stallman-about-open-access/>.
8. Fahnestock, 1986, p. 276.
9. Fahnestock, 1986, p. 279.
10. Fahnestock, 1986, p. 280.
11. Fahnestock, 1986, p. 281.
12. Fahnestock, 1986, pp. 289–290.
13. Fahnestock, 1986, p. 280.
14. Fahnestock, 1998, p. 330.
15. "PLOS ONE journal information," at <http://www.plosone.org/static/information>, accessed 21 May 2013.
16. "Why publish with PLOS ONE?" at <http://www.plosone.org/static/publish>, accessed 21 May 2013.
17. The seven criteria for publication in PLOS are as follows: "1) The study presents the results of primary scientific research. 2) Results reported have not been published elsewhere. 3) Experiments, statistics, and other analyses are performed to a high technical standard and are described in sufficient detail. 4) Conclusions are presented in an appropriate fashion and are supported by the data. 5) The article is presented in an intelligible fashion and is written in standard English. 6) The research meets all applicable standards for the ethics of experimentation and research integrity. 7) The article adheres to appropriate reporting guidelines and community standards for data availability."
18. "Publication criteria," at <http://www.plosone.org/static/publication>, accessed 21 May 2013.
19. The eight major categories into which this page is divided are: "Publication Ethics; Competing Interests; Authorship Criteria; Sharing Materials and Data; Copyright and Licensing; Publication Fees; Peer Review Procedures; Overview, Manuscripts Disputing Published Work; Related Manuscripts; Policies for Specific Research Areas; Human Subject Research; Clinical Trials; Animal Research; Paleontology and Archaeology Research; Methods, Software, Database, and Tools Papers; Dual Use of Research of Concern."
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21. *Ibid.*

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