Journal of Library Administration

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/wjla20

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The Scholarly Publishing and Academic Research Coalition (SPARC),
Published online: 11 Oct 2008.


To link to this article: http://dx.doi.org/10.1080/01930820802035125

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A Question of Access—
Evolving Policies and Practices

Heather Joseph

ABSTRACT. As scholarship becomes ever more digitally driven, the communication of peer-reviewed research results has undergone a dramatic transformation. The Internet has created an unprecedented environment where these results can be immediately and broadly shared. As researchers, funding agencies, and policy makers become aware of the opportunities afforded by faster and wider sharing of research results, access policies are evolving accordingly. From policies focusing primarily on protecting this material from unauthorized users, a proliferation of policies designed to leverage the value of funding agencies’ investment in research by sharing the results as widely as possible are now appearing. This paper will examine the rapid evolution of access policies, designed to create a more inclusive scholarly communications playing field, which are now appearing around the world.

KEYWORDS. Public access policies, scholarly communication, research results, open repositories

THE ISSUE

Funders, particularly government agencies, invest resources in support of research with the explicit expectation that this research will result in improvements for the good of the public. They anticipate that the results of research will spur the advancement of scientific discovery and innovation,
help to provide stimulus for the economy, and that this, taken in turn, will contribute to the improvement of the lives of the public.

There is a growing recognition that the communication of the results of research is an essential component of the research itself. If resources are invested in conducting an experiment, and no one ever learns of the results, what point was there in conducting the research in the first place? The dissemination of the results is a crucial part of the experiment.

Research is also, by nature, a cumulative process. It is only by sharing the results of one’s work, and by inviting others to build on it that we see science advance. Accordingly, it is only through use of research findings that funding agents can obtain value from their investment in research. Broad, fast, and seamless sharing of research results helps to fuel the advancement of science, and to ensure that the funding agents’ investment in that research is maximized.

Up until fairly recently, funding agents could be reasonably sure that their investment in research was being maximized by the dissemination of findings though traditional channels—namely, printed, subscription-based journals. It would have been quite impractical, inefficient, and expensive for them to consider taking on the task of broader dissemination of the results themselves. But as we know, the Internet changed everything and now presents us with an important new opportunity to bring information to new readers at virtually no marginal cost—making expanded access to research, in the view of many agencies, not only feasible, but necessary.

Today, even if it is available electronically, the research paid for by public institutions is, in too many cases, still simply not widely available. Users face obstacles in trying to access all the research they need at the time they need it. Funding agents, particularly government sponsored funding agents, recognize that this works against their interest, as well as the public interest, because this research is not being fully used and applied.

We are now beginning to see the emergence of policies that are designed to eliminate access barriers in order to allow research results to not only be more easily accessed but, just as critically, more easily shared and used.

The recognition that new opportunities existed for better dissemination of this information was an important milestone, and was not, in fact, initially articulated in any government policy, but rather in series of “declarations” that were signed by thousands of individuals, institutions, and funding bodies around the world, pointing out the need for a more open system of access to research.
These declarations included the Budapest Open Access Initiative,\textsuperscript{1} the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities,\textsuperscript{2} and more recently the Salvador Declaration on Open Access.\textsuperscript{3}

Since the issuance of these declarations, concerns about access to research results have been echoed and reinforced by a wide variety of civil-society institutions and now, in ever-growing number, by political bodies at national and international levels. Increasingly, these calls for enhanced access policies are rooted in the direct recognition that increased access to and use of research not only advances science, but also drives innovation and promotes economic competitiveness.

The call for greater access has been growing in volume and momentum, and one notable characteristic is that it has been growing from both the grassroots level and percolating upward, as well as from the government agency level, and trickling downward.

\textbf{AN ISSUE FOR THE PUBLIC}

Grassroots public support for the concept of public access to the results of publicly funded research, not surprisingly, runs deep. This was illustrated by the findings of a Harris Poll released in May 2006,\textsuperscript{4} which explored the public’s attitude toward accessing the results of scientific research on the Internet. Eight out of ten adults polled believe that if tax dollars pay for scientific research, people should have access to results of the research on the Internet.

Additionally, the poll showed that six out of ten (62 percent) believe that if these research results are easily available (for free and online), it will help speed up the discovery of potential cures for diseases.

As the results of the Harris Poll illustrate, the call for public access to publicly funded research results addresses the general public’s rising interest in self-education on health matters and the need to see the results of their investment.

It’s critical to remember that the general public is comprised of teachers, doctors, nurses and other health practitioners, small business owners, and others who have both a vested interest in this material and a demonstrated need for it. Patient advocacy groups have been particularly active in highlighting the barriers that they face in trying to get access. Sharon Terry, President of the Genetic Alliance and mother of two children with
a rare genetic disease called PXE, has described the problem in personal terms:

  When we went to try to find [information on PXE], we discovered that it was very hard to get. We lived in the Boston area at the time and were lucky to be able to go to one of the best medical libraries in the world. We went to the Harvard University library and found that we had to pay $25 to get in the door, which we understood because it’s a private university. So we paid the $25, but after about ten trips to the library we decided we couldn’t afford to continue that way.\(^5\)

**AN ISSUE FOR THE LIBRARY**

Even if Ms. Terry could afford to continue to pay the entry fee required to begin to look for the information she required, there is no guarantee that she would be able to do so—at least not without incurring additional fees.

The largest single purchaser of scientific research results (in the form of journals) is the academic and research library community. Yet no library can say that they can provide access to all of the research that may be of interest to its users. In fact, not even the wealthiest private research institution in the United States can afford access to 100 percent of the peer-reviewed research that it wishes to provide to its users, and for thousands of public and private colleges, universities, and research centers in the United States, the situation is far worse. This severely hampers the library’s ability to fulfill an essential part of it’s mission—providing patrons with access to information that they need in order to successfully carry out their research agendas.

**AN ISSUE FOR THE UNIVERSITY**

This, in turn, has a negative effect on the parent institution of the library, particularly when that institution is a university or college. Awareness of this issue, and of the new opportunities presented by networked digital technology, is beginning to bring down these longstanding barriers, and has been building in the higher education community as well.

Over the past year the provosts and presidents of more than 130 leading U.S. universities and colleges have expressed their support for a policy that would ensure broad public access to the results of research funded by U.S. government agencies.

In one such statement, published as an open letter in the publication *Inside Higher Education*, the provosts of twenty-five leading U.S.
universities encouraged the community to look for a new way of disseminating research findings. They wrote:

The broad dissemination of the results of scholarly inquiry and discourse is essential for higher education to fulfill its long-standing commitment to the advancement and conveyance of knowledge. Indeed, it is mission critical. . . . In keeping with this mission, we agree with the basic premise that enabling the broadest possible access to new ideas resulting from government-funded research promotes progress, economic growth, and public welfare. Furthermore, we know that, when combined with public policy such as [The Federal Research Public Access Act—FRPAA] proposes, the Internet and digital technology are powerful tools for removing access barriers and enabling new and creative uses of the results of research.6

This letter was particularly notable in part because it articulated the importance of the opportunities that access to this subset of research can create, and highlighting the importance of new and innovative uses for these research results that the academic and research community is currently unable to sufficiently leverage:

“Widespread public dissemination levels the economic playing field for researchers outside of well-funded universities and research centers and creates more opportunities for innovation. Ease of access and discovery also encourages use by scholars outside traditional disciplinary communities, thus encouraging imaginative and productive scholarly convergence.”7

The provosts concluded that a policy enabling broad public access to research results “is good for education, and good for research.”

**AN ISSUE FOR RESEARCHERS**

There are strong signs that the research community would agree with that conclusion. In an unprecedented show of support for greater access to publicly funded research results, more than 20,000 individual researchers and research institutions signed a petition presented to the European Commission in February of 2006 calling for the Commission to guarantee public access to publicly funded research results. The researchers signed a statement that underscored their collective belief that, as researchers, their mission of disseminating knowledge was “only half complete if the information is not made widely and readily available to society.”8
These recent, strong statements by leaders in both the higher education community and the research community are reflective of a deepening understanding of the sea change in how science is conducted that has been underway for the past several decades. The vast majority of scientific research is data driven, interdisciplinary, and takes place almost entirely in cyberspace. Capturing the digital results of publicly funded research and ensuring that they are made broadly accessible in interoperable repositories further leverages the public’s investment in research, by creating a unique series of resources that can be used in new and innovative ways—providing direct benefit to researchers and to the public as a whole.

Additionally, a growing body of evidence illustrates another benefit that is increasingly motivating researchers to press for greater public access to research results. Over the past five years, studies have shown that when scientific research is accessed more frequently, it has greater impact on subsequent research.

This is important on two fronts. First, on an individual level, impact is an important criterion in funding, promotion and tenure decisions. Second, on a much larger, community level, these findings demonstrate how public access, by eliminating use barriers, can expand the application of research to further advances.

**A MARKET ISSUE**

Because of the amount of money involved—in the United States alone, the Federal Government invests tens of billions of dollars in research annually—the mechanisms for disseminating these results, and the businesses that carry out this dissemination are of keen interest to market analysts. And dissemination of this information is big business—according to Outsell, a market research company that covers the STM publishing industry, the STM market totaled nearly nineteen billion dollars in revenue in 2006.

Publishing industry analysts at various firms have been tracking the industry for years, but signs that the market was ripe for change began emerging in earnest in 2004. For example, analysts as Credit Suisse First Boston wrote about the imperative for change in this 2004 report, which pointedly noted:

> We would expect governments (and taxpayers) to examine the fact that they are essentially funding the same purchase three times:
governments and taxpayers fund most academic research, pay the salaries of the academics who undertake the peer review process and fund the libraries that buy the output, without receiving a penny in exchange from the publishers for producing and reviewing the content. . . . We do not see this as sustainable in the long term, given pressure on university and government budgets.12

**It's Now a Policy Issue**

And indeed, governments (and taxpayers) have, in fact, begun to examine exactly this phenomenon. Governments, acting both on their own (such as Australia13) or working in concert (such as within the OECD14), have commissioned a number of reports targeted at analyzing the state of the market for dissemination of research results. As these reports have been completed and the resulting recommendations made public, some striking themes have emerged.

For example, in a 2005 report on scientific publishing, the International Organization for Economic Cooperation and Development (OECD) examined the current workings of the scholarly publishing marketplace, and concluded: “Governments would boost innovation and get a better return on their investment in publicly funded research by making research findings more widely available.” And that by doing so, they would “maximize social returns on public investments.”15

Shortly thereafter, in 2006, the European Commission published its report on the findings of their own extensive independent study of the economic and technical evolution of the scientific publishing market. The authors of the report note:

“Scientific publication ensures that research results are made known, which is a precondition for further research and for turning this knowledge into innovative products and services . . . [G]iven the scarcity of public money to provide access to scientific publications, there is a strong interest in seeing that Europe has an effective and functioning system that speedily delivers results to a wide audience.”16

The report included a series of recommendations for future action, and its number one recommendation was that research-funding agencies should “guarantee public access to publicly-funded research results shortly after publication.” This recommendation, which became the focus of the European Union-wide petition discussed earlier, is expected to be taken up for debate by the European Parliament later this year.
In the United States, in an open letter to members Congress, twenty-five Nobel Laureates expressed their strong support for action to be taken to ensure that the results of publicly funded science are made broadly accessible to the public, saying:

“Science is the measure of the human race’s progress. As scientists and taxpayers too, we therefore object to barriers that hinder, delay or block the spread of scientific knowledge supported by federal tax dollars—including our own works.”

WORLDWIDE MOMENTUM TOWARDS ACCESS POLICIES

The theme of “public access to research as soon as possible after publication in a peer-reviewed journal” has become a cornerstone in policies that are currently under consideration worldwide in ever-increasing numbers. In the United States, this language appears in such prominent examples as the National Institutes of Health’s Public Access Policy, along with the proposed Federal Research Public Access Act of 2006, which spans eleven of the largest agencies that provide funding for scientific research.

Worldwide, policies that essentially have this language at their core have emerged from such geo-politically diverse agencies as the Research Councils United Kingdom (RCUK) and the Ukrainian Parliament; The Canadian Institutes of Health Research and the South African Academy of Sciences; The French National Research Center and The German Research Foundation; and these policies are now in various states of play: from formally adopted (leading off with five of the eight UK Research councils adopting mandatory public access policies) to pending action within reasonably short time frames (the CIHR, for example, is expected to announce a formal policy before the end of 2007).

Common Themes in Policies

Commonalities in these policies emerging from widely geographically diverse locations are not limited to simply calling for public access to the results of publicly-funded research as quickly as possible. The policies also share many common drivers, which have been articulated in various publications and forums, and include a number of crucial points.

Perhaps most important among these is the explicit recognition and articulation that the dissemination of results is an inseparable, essential
component of research and of the funding agent’s investment in that research.

This simple, powerful belief, coupled with the understanding that new technologies present previously unobtainable opportunities for expanding the communication of research results, is the key tenet driving the creation of these new public access policies.

It is also crucial that framers of many of these policies also explicitly seem to recognize the power of these public access policies to expedite, expand, and strengthen their ability (and in fact, their national ability) to leverage their investments in scientific research. This drive for the ability to realize a markedly increased return on a collective investment in research has served as a powerful incentive. In almost all cases, supporters of these emerging policies point to the potential in allowing greater access to research results to create and provide new avenues for use of federally funded research results and to stimulate new discoveries and new innovations.

And one final commonality has also emerged in terms of drivers—these fledgling policies hold the appealing promise that they can also increase a funding agent’s ability to track results of research in which they have invested—increasing both the transparency of the organization, as well as the accountability of the agent to the public.

Common Elements in Emerging Policies

It is also quite striking to note that as these policies have emerged, several elements have been consistently present in the actual structure of the policies. Almost without exception, the policies include (with slight variations, of course) these elements:

1. The policies generally require that the recipient of funds from the granting agencies deposit of copy of a final manuscript that has been accepted for publication in a peer-reviewed journal into and online repository approved/sanctioned by that granting agency.
2. The policies also generally require that repositories in which the manuscripts are deposited must be stable digital repositories that provide for free public access to the manuscript, that provide for maximum interoperability, and that also makes provisions for long-term preservation of and access to the manuscripts.
3. And finally, the policies generally stipulate that free, public availability of manuscripts must be enabled as soon as possible
after publication, with the current time period defining “as soon as possible” ranging from 0 to 12 months after publication in a peer-reviewed journal.

These consistencies in the proposed implementation of the policies underscore the consistencies of purpose in the policies that they are designed to support.

**Emerging Elements in Policies**

Of course, while the elements described above have remained quite stable over the past several years as these policies evolved, there are several areas where new elements, or variations of these elements, have begun to emerge. There are several areas where nuances in the basic elements have begun to crop up, which may ultimately become staples of the policies as well.

One such area is in giving a researcher more options in how to comply with a requirement for public accessibility of their research results. In a few cases (most notably in the draft CIHR policy), proposals have been included that would give funding recipients the option of depositing their accepted manuscript in an openly accessible repository, with an embargo period in place, or, alternatively, to publish their manuscript in an Open Access journal with no embargo period in place.

As policies have evolved, more flexibility has been slowly introduced in terms of the location and type of repository sanctioned by the policy. For example, when the NIH public access policy was introduced, it required deposit in a single, centralized database, PubMed Central (PMC). While the current NIH policy continues to require deposit in PMC, the agency has also begun to implement mirror sites with reciprocal deposit arrangements in countries outside of the United States, ensuring researchers that their material will have the archival protection that co-location in geographically diverse databases provides, as well as the additional benefit of links to material funded by other agencies whose research outputs are complementary to those of the NIH.

Perhaps the most striking kind of arrangement appears in the proposed Federal Research Public Access Act, which requires that manuscripts be “preserved in a stable digital repository maintained by that agency or in another suitable repository that permits free public access, interoperability, and long-term preservation.”

27
This language allows for a wide variety of possible solutions to be conceived, ranging from each agency constructing its own database solution, to agencies collaborating in various configurations to achieve economies of scale and other operating efficiencies, and even to the possibility that agencies might collaborate with organizations outside of the federal government, in public-private partnerships with institutions who share similar values or missions. This flexible approach can enable individual communities to implement solutions that best respond to their differing cultural and financial circumstances, norms, and requirements.

Finally, several of the organizational bodies that have public access policies currently under consideration have expanded their discussions of the need for broader public access to cover research outputs in addition to peer-reviewed journal articles. In both Canada and Australia, for example, policy discussions have included research data as well.

The inclusion of data in a handful of these policies highlights the likelihood that policy-level interest in leveraging significant investments in research will only continue to grow. As the benefits of faster and broader access and use of primary research literature are realized, it is quite likely that pressure to see similar results by unlocking the underlying data will intensify as well. In the context of the policies currently under consideration, it is unclear at this time whether, given the complexities inherent in dealing with raw data, it will be able to be successfully considered as one component in a larger public access policy or if it will indeed require a separate policy designed to specifically accommodate its own unique traits.

Regardless of how these variations ultimately play out, a clear trend has become evident—public access policies are surfacing in ever-increasing numbers, and with striking similarities, from around the world. The emergence of these policies is indicative of new and deepening collective understanding of opportunities presented by the digital research environment to more fully exploit results of research collectively funded by the public.

NOTES

7. Ibid.
15. Ibid.
18. NIH Public Access Policy.