Scholar and Researcher Practices and their Impact on Scholarly Publishing

Digital media and tools have upended how knowledge is created and shared, while the motivations and purposes of research are little changed. Examining the interaction between digital change and enduring functions and behaviors may throw light on how research collections are to be sustained, shared, and preserved.

Context

Researchers work within a system that developed during post WWII social and educational changes, which included rapid growth of universities, increased government funding, specialization of research, and demographic increases.

Commercialization

- The commercialization of scholarly publishing also occurred. As digital technology evolves, commercial entities have extended their influence into all stages of research, including data access, publishing, sharing and collaboration, and evaluation.
- Commercialization has made ownership and control of research output a complex responsibility. Knowledge of copyright and intellectual property practices and law are required of scholars and researchers, for both their own research and to guide their own use of information. It is well known that many don’t pay attention to these issues, creating another sort of challenge.
- Open Science, which includes Open Access and open availability of other research tools and information, is a reaction to what is often viewed as the stranglehold of commercial entities on scholarly research. These open movements developed within research communities, and support free and unfettered access to publicly supported research.[1]

Disciplinary Differences

- Disciplinary differences are manifest in preferences for published output as well as research practices. Humanities researchers value the monograph, mostly in print, yet at the same time, digital humanities have developed innovative digital tools for sharing and dissemination.
- Professional schools (Education, Management, Law, Engineering) bridge the gap between research and practice. Professional reports and tools, beyond peer-reviewed research, are essential to their scholarly practices.
Collaboration and Competition

Researchers and scholars operate in an environment that balances competition and collaboration. Sharing is intrinsic to the culture of research, and collaboration, both organizationally and intellectually, occurs within and across the communities of scholarly practice. At the same time, researchers work in a competitive reward system, competing for funding, status, and recognition. Universities likewise function in a complex balance between collaboration and competition.

Publication and Prestige

The European Commission Report characterizes scholars, in their competitive aspect, as ‘status seekers,’ motivated by the ‘reward system and the tools used to assess their work (in particular the impact factor).’[2] Publishing is the chief means of achieving prestige, and, along with tenure and promotion, the primary motivator for research and its dissemination.

Information Seekers

Scholars and researchers are information seekers, with many individual, disciplinary, and functional differences in how they acquire information. Digital tools have transformed methods of information gathering, even while basic needs for, and purposes of, information remain unchanged. Scholars can find more information quickly, increasing range and variety, and the complexities of management and assessment of it.

University library collections continue to be the most important source of information, but are by no means the only one. Colleagues are important, as is information that is freely available.[3] Resource-sharing networks and interlibrary loan provide resources from other collections, especially important for the ‘Long Tail’ of little used, unique monographs.

In scholarly publishing, from the perspective of both authors and readers, articles are not substitutable.[4] That is, articles covering similar topics may have unique value because of perspective, methodology, and outcomes. This has implications both for researchers’ needs for wide access to information and the way in which the scholarly publishing industry functions.
Data Collectors

Storage and management of research data, most often now in digital format, is a constant part of a researcher’s day. Data is of critical importance to scientists and social scientists; many humanists, although they may not describe them as data, accumulate digital objects. [5]

As the value of research data, and the potential for sharing, has been recognized, funding agencies may require preservation and access as a condition for support. The Open Data movement, a strand in Open Science, advocates for collaboration and sharing of research data. Recent initiatives to address preservation and distribution of research data include Portage, a Canadian research library enterprise to coordinate expertise, services, and infrastructure.

Where Researchers Publish and Their Audiences

Research is primarily published in:
- Peer-reviewed journals,
- Conference proceedings, and
- Monographs.

These format preferences are greatly influenced by disciplinary differences. Although digital tools have changed research workflows considerably, ‘the formats and scope of scholarly publications remain largely unchanged from the days of print,’ and the journal article is still the primary vehicle for research dissemination. [6] Perhaps as a byproduct of the digital age, the increasing primacy of the journal article has been noted in most disciplines.

These choices reflect preferred audiences: peers and fellow researchers are generally most important; students follow closely behind. Humanists may be more interested in undergraduates as an audience than other groups of researchers [7].

Many researchers have blogs and websites for communicating with peers, students, and sometimes the general public, and also use institutional repositories, trade publications, media and images to distribute research. [8] Some of these formats, lacking the prestige of formal publications, reflect the distinction between publishing and communication.
Some scholars, particularly in the digital humanities, have explored new ways of publishing research in the digital environment, and suggested that peer review and recognition structures will need to change if such formats are to achieve scholarly legitimacy. [9]

Functions of Scholarly Publishing

Four basic functions, identified early in the history of scholarly publishing, are the primary responsibilities of scholarly publishing, and are still largely valid today:

- **Registration**, to establish that work had been undertaken by individuals or groups of researchers at a particular time, and thus their claim to precedence; [9]
- **Certification**, to establish the validity of the findings; [9]
- **Dissemination**, to make scholarly works and their findings accessible and visible; [9]
- **Preservation**, to ensure that the ‘records of science’ are preserved, and remain accessible, for the long term. [10]

Researchers’ interest in the scholarly publishing system is largely limited to two of these:

- Communicating with colleagues,
- Advancing their career.

Researchers have been generally insulated from the financial aspects of publishing because access to journals, and publishing in journals, is paid for by their institutions, libraries, or funders.

Publishers and libraries have traditionally supported these four functions, with libraries ensuring **dissemination** and **preservation**. The digital environment has increased the power, complexity and diversity of possibilities for support, and scholarly organizations, commercial intermediaries, and other digital infrastructures now are part of the infrastructure. Academic libraries have led digital preservation initiatives, and are active in assuring the continuance of all these functions.

Peer Review

Peer review is the primary way in which **certification**, or establishing the validity of research findings, is accomplished. Its aims include ensuring:

- Research is technically sound,
- The research process has been fully described and findings properly presented,
- Research meets ethical and reporting standings,
- Evidence of malpractice is followed up on. [11]
The scientific research community strongly and rightly supports peer review, but concerns have arisen about how it is practiced, including maintaining rigor, ensuring transparency, and reducing bias. The merits of different kinds of peer review (open, single-blind, or double-blind) are debated, all with little evidence that peer review is effective at assuring the quality of published research. Subjectivity and confirmation bias are inevitable challenges.

Peer review has also expanded beyond its original aim of certification to the evaluation of research, by examining aspects such as novelty and impact. Another significant conversation is determining the appropriate place for peer review in open access publishing.

Ironically, the sharing culture of research leads researchers to provide free services to commercial publishers (peer review), and formalization of scholarly recognition increases the importance of peer review/impact factors. These two characteristics, fostered by commercial publishers, have also allowed their dominance in scholarly publishing.

Reward Systems

For researchers, publication is fundamental for support and recognition. Teaching, while essential, by itself does not assure support and recognition. Since publishing in journals that circulate widely and are read by peers is necessary to maintain funding, researchers are often pushed to choose high impact journals.

Research funding drives, not just faculty choices of publishing venues, but also systems of university rankings. ‘University rankings rely heavily on metrics associated with research funding, with articles published in prestigious journals – i.e. journals with a high impact factor - and with monographs published by prestigious publishing houses.’ The importance of journal rankings to universities and funding also explains why open access journals may be considered less desirable publishing outlets.

Evaluation: Journal Impact Factor as a Measure of Research Quality

Reward systems are based upon evaluation of research quality. Although peer review may function as an evaluation tool, the de facto measure of research quality in most disciplines is the Journal Impact Factor (JIF). The JIF is one of many bibliometric measures that evaluate different aspects of research
quality: all are largely quantitative, and most employ usage statistics, which ends in downloads translating as value.

The **Journal Impact Factor** is based upon the annual number of citations to articles published in a particular time period in a journal. Originally developed for collection development decisions, the data comes from the Web of Science Citation Indexes.\[15\] Its weakness as an evaluation tool is simply that the JIF is a surrogate, and does not guarantee the quality of any individual work published in that title.

The **evaluation system**, particularly the JIF, has been characterized, as the ‘most important structural element of the present research ecosystem.’ because the JIF shapes decisions made by all the key players - researchers, universities, publishers, and funding agencies.\[16\] While replacing the JIF would create real challenges for all, the present use of metrics, notably the JIF, has the unfortunate effect of supporting rankings, which speak to perceived prestige rather than quality.

A recent article, documenting the use of the JIF in **faculty review**, promotion, and tenure decisions, calls into question whether this is an appropriate use for the measure, especially since researchers have less ability than funders, universities, and other research entities to avoid use of the JIF.\[17\]

For collections sustainability, the current importance of the JIF is unfortunate, since it has led to an emphasis on prestige titles, and it is not surprising that commercial scholarly publishers of such titles have increased prices to libraries.

Open Science supports changes to research evaluation: The Declaration on Research Assessment (DORA) and the Leiden Initiative are Open Science initiatives for changes in evaluation metrics. They suggest metrics are needed that:
- ‘Are sensitive to differences between subjects and disciplines.
- Offer greater transparency in data collection and analysis
- Ensure regular scrutiny and review of the metrics used.’  \[18\]

**Conclusion**

The tension between collaboration and competition in research influences the responses of funding agencies and universities as well as researchers to the digital environment. Open Science, in stressing the collaborative foundations of research, recognizes that ensuring unfettered access to information aligns with basic needs of researchers. Ensuring sustainability of scholarly collections should be a benchmark for a successful digital transition for all publicly funded research.
[1] See the website FOSTER: What is Open Science?
https://www.fosteropenscience.eu/content/what-open-science-introduction.
Retrieved April 14, 2019.


