

## **Measuring Value and Journal Article Reading Patterns: Changes Over Time**

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### **INTRODUCTION**

Libraries collect data about their users and use of collections for many reasons. Usage data for electronic resources can assist with collection development, reveal which systems and sources are most often used, and show how users access library e-collections (Huntington et al. 2006; Nicholas et al. 2006a; Nicholas et al. 2008; Nicholas et al. 2004). Amount of use is also an implicit measure of the value of a library's electronic collection. Usage log data, however, do not tell us much about individual users, provide information about how to improve library products and services, or give explicit measures of value and outcomes of use. Surveys of users give a more detailed picture of users or user groups and provide explicit measures of value and outcomes of reading and library collections. Log data and surveys together can be used to show patterns of use by academic staff and students and the value and purpose of reading scholarly journal articles (Tenopir et al. 2007a; 2007c).

The focus of this presentation will be on a user-centered approach to answer questions about how faculty, staff, and students use library collections, rather than a materials-centered approach that answers questions about the e-journals collection. Surveys of

academic science, social science, engineering, and medical faculty by Tenopir & King (2000; 2004; Tenopir et al. 2009a) over thirty years show how reading patterns have changed and the changes in usage and value of e-article readings. These surveys used the critical incident technique to focus on specific outcomes and values of readings from all sources in all formats. Four changes that demonstrate value of reading and libraries are presented here.

## **FINDINGS**

- 1. Faculty members report more readings, less time per reading, but overall a small increase in total time spent reading. Amount of reading is an implicit value of reading.**

Amount of reading and time spent reading are both implicit values of scholarly articles and the sources, such as libraries, that provide access to them. As usage or amount of reading increases, an increase in value can be implied. Usage logs can be used to easily measure this implicit value. Implicit value can also be gathered in surveys that ask questions about amount of use (Tenopir and King 2007). The Tenopir and King surveys include several questions that help derive implicit measures of value, including:

- How many articles did you read in the last month?
- For the last article, how much time did you spend reading?

Users show the value of reading because they are willing to pay with their time. For example, in surveys in five U.S. and two Australian universities in 2005, faculty reported they spend on average approximately 143-159 hours per year reading, while medical

faculty members report they spend on average approximately 168 hours per year reading. This does not include the time spent finding and locating articles (King et al. 2009).

Although we cannot claim cause and effect, faculty members who report winning awards in the past two years or who publish two or more articles in the past two years read on average more than others (Tenopir and King 2000).

Over time, the reported number of article readings has increased on average per science, social science, medical or engineering faculty member. In our latest surveys the average has increased to 23 articles per month. Projecting to a year (12 months) shows an increase in reading of approximately 87% since 1977 (from 150 to 280) (Tenopir et al. 2009a).

Although the amount of reading has greatly increased, the exact amount of reading has always varied considerably by field of science or discipline. For example, medical faculty consistently over time have relied on journal articles more than any other group and read on average nearly twice as many articles per year as do social science scholars (Tenopir et al. 2007b). In 2005 the average number of annual article readings by medical faculty was an estimated 414, compared to 331 for sciences, and 233 for social sciences<sup>1</sup> (Tenopir et al. 2009b).

There are many possible reasons for an increase in readings, for example having electronic access broadens the scope of access for potential articles and there are more

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<sup>1</sup> Standard errors and 95% confidence intervals: Medical (27.54, 360-468), sciences (26.79, 279-384), social sciences (12.24, 209-257.)

articles and journals published now than in the past, so scholars have to read more just to keep up with developments in their field. Still, more readings imply a continued and increasing use value.

**2. Faculty members read from a wider variety of sources and use many ways to get articles. The increase can be attributed to library collections and is a direct value of libraries.**

The range of journal titles used has also increased over time. Usage logs show that when journal titles are made available in library e-collections, reading is highly skewed (most readings come from a small number of titles), but that the tail is long--at least one article is downloaded from all or almost all titles that are made available (Nicholas et al. 2006b) Surveys confirm these findings. In 1977 researchers reported reading on average at least one article from 13 journal titles. In 1995 that number had increased to 18; by 2003 it was 23 and by 2005 it was up to 33 journal titles (Tenopir et al. 2009a).

The increase in journal titles made available in library e-collections is almost certainly the major reason for this increased diversity. Between 1977 and 2005 readings from the library increased from 37 to 174 per year per person on average, with over 100 of those from the library electronic collection. Over the same time, readings from personal subscriptions plunged. The library provides a greater number of readings on average, a greater variety of sources, and plays an important role in e-journal reading. Readings from print are more likely to be from personal subscriptions, while readings from the library are more likely to be electronic (Tenopir et al. 2009a).

### **3. Faculty members still read from both print and electronic sources. E-**

**readings are reported as more valuable and are more often from libraries.**

In surveys from 2000 through 2006 approximately 60% of all article readings by faculty on average were from electronic sources, with 40% still from print sources. (This refers to the format of the source, not the form in which it was actually read. A majority of readings are still printed out on paper for actual reading.) This varies significantly by subject discipline of the reader, with science faculty reporting a much higher percentage of their readings from electronic sources (74%) than humanities faculty (29%) (Tenopir et al 2009b).

The library readings are overwhelmingly from e-collections (74% and growing), while the diminishing numbers of personal subscription readings are still overwhelmingly from printed journals. Younger readers prefer electronic journals and libraries' e-collections continue to grow, so this trend will continue (Tenopir et al. 2009b).

In addition, reading of older articles is increasing slightly as more older articles become available in electronic form. Readings of older articles are more often for research purposes, more often from the library, and are more highly rated as valuable by readers.

### **4. Faculty members report many purposes and explicit values of reading e-journal articles.**

Measuring the purpose of readings and the value of readings to that purpose provide a more nuanced view of value and use of articles than just mere measures of amounts or patterns of use. Faculty members read for many purposes and the purpose of each reading lends unique characteristics to that specific use. More than half of all readings of scholarly articles are for research and most likely to come from library electronic collections. Readings for current awareness may come from personal print subscriptions, while readings for teaching, writing grant proposals, and other purposes come from a variety of sources and forms.

Faculty members report many explicit values of readings including, in descending order of frequency, that the reading:

- Inspired new thinking
- Improved results
- Changed focus
- Resolved technical problems
- Saved time
- Collaboration
- Faster completion
- Wasted my time (<2% of readings)

(Tenopir and King 2007)

In surveys and interviews, faculty members report many explicit values of readings and, in particular of electronic journals collections available through the library. These

comments tell qualitative stories of the value that library e-collections bring to users and can be more compelling even than quantitative or implicit measures of use. For example, in our surveys from 2000-2009 faculty members often offer comments such as these:

- *How did we ever get along without electronic journals?*
- *The ability to obtain articles online has made [my work] much more efficient and more thorough.*
- *E-journal access “has increased the strength of my grant proposals ... by allowing for ...thorough evaluation of the literature on any particular topic.”*
- *“I have dropped some personal subscriptions as they have become available online. I rarely visit the library in person anymore... which, compared with the ease and convenience of doing literature searches, downloading and printing from my office/computer, takes too much time.”*

Libraries must be careful to measure total use of their collections, as the above quote shows. Use of electronic collections is much higher than use of print ever was and yet our measures may not have kept pace with this change of usage patterns.

## **CONCLUSION**

In conclusion, measuring reading patterns demonstrates both implicit and explicit values of the library collection and e-resources now and over time. Usage logs can help with e-collection decisions and show implicit value of e-collections, while surveys with critical incident can show implicit and explicit value of print and electronic collections.

Studies over time show that reading is increasing, use of e-collections is increasing, and the importance of the library is growing. Libraries can demonstrate their value and show those changes over time with accurate and ongoing measurements of use and usage.

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