An "All" Electronic Journal Collection in a University Library: Two Years Later[1, 2]

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Introduction

The Hagerty Library of Drexel University is one of the first U.S. academic libraries to migrate to an (almost) all-electronic journal collection. In most cases print issues were not kept, even if they were available without additional cost, i.e. a "bundled" title. Beginning in mid-1998 the electronic format *only* was preferred whenever possible so that by 2001 the electronic collection had grown to 7,600 titles and the print journals numbered under 350 subscriptions. Since then, the number of both print and electronic subscriptions has grown as shown in table 1.

With support from the Institute for Museum and Library Services Leadership Research Grant the library made a systematic study of the impact of this change on staff and costs, and also conducted a survey to ascertain the effect on faculty and doctoral student use of the journal literature. Descriptions of these studies' methodologies and many results have been reported in two papers (Montgomery and King 2002, King and Montgomery 2002) and will be presented in detail in a forthcoming book and on the Drexel Library web site (http://www.library.drexel.edu/facts/imls/default.html). The present paper reports the key findings.

Table 1. Unique Print and Electronic Journals

Type	1998	1999	2000	2001	2002	2003
Print	1,710	1,475	1,000	300+	370	375
E-Journal	200	4,400	5,000	7,600	8,600	12,000

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Table 2. Operational Costs Summary

Item	Electronic Journals	Current Journals	Bound Journals
Space	$ 5,000	$40,000	$205,000
Systems	10,000	2,500	2,400
Supplies & Services	(2,000)	600	8,000
Staff by Function			
Director/Administration	22,000	0	0
Communications [among staff]	7,000	2,500	800
Collection Development	18,000	6,000	0
Acquisitions	8,000	4,000	0
Physical Handling: Bindery, Labeling,Re-shelving	0	10,000	22,000
Record Creation and Maintenance	16,000	10,000	6,000
Public Relations/Communications/ Publications	11,000	1,000	600
Reference	37,000	7,000	4,000
Teaching [users]	6,000	1,000	600
Other	0	4,000	6,000
Subtotal Staff	127,000	46,000	42,000
TOTAL OPERATIONAL	$138,000	$90,000	$258,000

Drexel was well-positioned to carry out these studies because it is one of the first U.S. academic libraries to migrate to an electronic journal collection. Several institutional factors converged to make this rapid transition possible and right for Drexel. Formerly Drexel Institute of Technology, Drexel is a technologically-oriented, Research Intensive university (according to the latest Carnegie classification) with approximately 500 full-time faculty and 13,000 students. The library had:

- strong support from the University administration;
- a large majority of computer literate users;
- networking and PC infrastructure in place;
- a poor current print journal collection;
- a major budget increase;
- the need to support growing distance education programs; and
- ready access to large print journal collections in the immediate area.

The cost study covered ALL operational costs in addition to cost of subscriptions. Library staff recorded their time spent on journal-related tasks during sample weeks over a one- and one-half year period. Other expenses were either computed (e.g., binding, storage) or allocated on a use basis (e.g., computer workstations).

The self-administered questionnaire was distributed to the entire 496 faculty with 91 responses (18% response rate) and to 342 doctoral students with 104 responses (30% response rate). The survey responses from faculty and doctoral students reasonably reflect the respective populations sampled, although responses from the College of Arts and Sciences for both faculty and doctoral students appear low, perhaps because of the relatively lower priority of the journal literature in relation to books and primary sources for scholarship in the humanities and social sciences.

Table 3. Cost Per Use by Journal Type

Journal Type	Subscription Cost [1]	Recorded Use [2]	Subscription Cost per Use[3]	Operational Cost per Use[3]	Total Cost per Use[3]
Electronic Journals					
Individual Subscriptions	$ 73,000	23,000	$3,20	$0.45	$4.00
Publisher's Packages	304,000	134,000	2.25	0.45	3.00
Aggregator Journals	27,000	20,000	1.35	0.45	2.00
Full-Text Database Journals	59,000	159,000	0.40	0.45	1.00
Total	$462,000	335,000	$1.40	$0.45	$2.00
Print Journals					
Current Journals	$38,000	$15,000	$2.50	$ 6.00	$ 8.50
Bound Journals	N/A	8,800	N/A	30.00	30.00
Total	$38,000	24,000	$2.50	$15.00	$16.00

[1] Cost of *only* the titles for which use data is available.
[2] Use data supplied by the publisher or vendor for publisher's packages, aggregator journals, and full-text databases. Use data for individual subscriptions is extrapolated from "click" counts. Use of print only journals is from re-shelving counts. Because in some cases vendor data was unavailable for a month or two the numbers will be analyzed further.
[3] Numbers rounded.

Key Findings

1. The largest nonsubscription costs are storage space for bound journals and staff time to support electronic journals. Table 2 is a summary of the operational cost data which was computed separately for electronic, bound print and current print journals.

2. Cost per use is lowest for the electronic journals found in aggregator's packages, and highest for bound journals.

A "subscription" in the electronic world is not a simple payment for the annual content of a journal title. And the price models and electronic content vary so radically that Drexel has found it necessary to define four electronic journal types:

• Individual Subscriptions, which are almost always purchased from a subscription agent.

• Publisher's Packages which may or may not be part of a consortium "deal," and are acquired by purchase through a subscription agent, the consortium or from the publisher directly (e.g., ScienceDirect, Kluwer).

• Aggregator Journals which come from vendors that provide access to different publishers' journals. The aggregators do not drop content, only add. The collections started as full-text content and added searching (e.g., JSTOR, MUSE).

• Full-Text Database Journals that provide access to electronic journals from different publishers but do not make title or issue level access available (except ProQuest). Examples are WilsonSelect and Lexis/Nexis. Table 3 shows these costs for the various classes of electronic journals and for the print collection.

3. The amount of reading and time spent reading by faculty is consistent with observations in other universities that have smaller electronic collections.

The amount of reading and time spent reading by faculty is similar to that observed elsewhere (Tenopir and King 2000). These averages are all less for the faculty than for the doctoral students, a phenomenon that was observed in earlier studies done at the University of Tennessee and The Johns Hopkins University. Drexel faculty follow different information seeking and reading patterns from doctoral students as well. See Table 4.

4. Forty-two percent of faculty reading is from library-provided articles, while doctoral students depend more on library-provided articles (76% of readings).

Table 4. Average Annual Number of Articles Read Per Faculty Member and Doctoral Student and Average Time Spent Reading: 2002

	Faculty	Doctoral Students
Average Readings/Person	197	248
Average Time/Reading (minutes)	39.8	50.7
Average Annual Time/Person (hours)	130	210

Source: Drexel University Readership Survey (n=195)

Also consistent with numerous earlier studies, the faculty still depend heavily on personal subscriptions.

5. The majority of readings of library-provided articles are from the electronic format.

This result is not surprising considering that the overwhelming majority of recent library subscriptions are electronic. This use pattern is consistent with the library's use data in that electronic use projected from the readership survey is similar in magnitude to that projected from library-collected data.

Discussion

This is a case study. Drexel policies and practices impact many of the specific costs in significant ways – i.e., the decision to use a web-based system to provide access to electronic journals, rather than cataloging lection had an effect on the amount of reading, outcomes from reading and the information seeking and reading patterns. The results suggest that, on balance, the electronic collection appears to be well read, with highly favorable outcomes.

Patterns are consistent with those found in other universities with two exceptions:

• Most of the library-provided reading is from electronic articles: 70 percent of faculty readings and 77 percent of doctoral student readings.

Table 5. Readings by Faculty and Doctoral Students by Source of Article Read: 2002

Source	Faculty (%)	Doctoral Students (%)
Personal Subscription	46.1	13.6
Library-Provided	41.5	75.7
Separate Copies	12.4	10.7
Total	100.0	100.0

Source: Drexel University Readership Survey (n=195)

• Readers report that they spend much less time locating and obtaining library-provided articles when they are available electronically.

The data presented here are for one academic library only - a case study and as such can only suggest answers. These analyses were taken as a first step to shed light on what we believe is a crucial issue: the fundamental changes in scholarly communications that will result from the transition from print to electronic journals. The impact on libraries, their funders and their users will be great. It is important that the persons guiding these changes have the best information available to inform their decisions.

These findings are part of long-term ongoing research to compare journal formats. As this research has progressed a framework of metrics was developed for evaluating the three collection services: (1) electronic journals; (2) current journals; and (3) bound journals (see King, et al., 2003). The framework consists of five specific measures: input cost of resources, output quantities and attributes, usage (amount of use and factors affecting use), consequences of using information provided by the services, and domain measures of the characteristics of the service environment. Derived measures include service performance (i.e., how well the service performs in terms of relationships between service input and output), effectiveness (i.e., how effective the service is on service use), the impact of the services, and cost and benefit comparisons of electronic and print collections and services.

Upcoming results include comparison of information-seeking and readership patterns for scientists using pre-electronic, evolving and advanced electronic library collections at the University of Tennessee and Drexel University.

Table 6. Proportions of Readings by Faculty and Doctoral Students by Form of Library-Provided Read Articles: 2002

Form of Library-provided Articles	Faculty (%)	Doctoral Students (%)
Print Subscription	13.5	11.5
Electronic Subscription	70.3	76.9
ILL/Document Delivery	16.2	11.5
Total	100.0	99.9

Source: Drexel University Readership Survey (n=195)

References

King, D.W., P. Boyce, C.H. Montgomery, and C. Tenopir. 2003. "Library Economic Metrics: Examples of the Comparison of Electronic and Print Journal Collections and Collection Services." *Library Trends* (scheduled for publication 51:3 (winter).

King, D. W., and C.H. Montgomery. 2002. "After Migration to an Electronic Journal Collection: Impact on Faculty and Doctoral Students." *D-Lib Magazine*, 8:12. http://www.dlib.org/dlib/december02/king/12king.html.

Montgomery, C. H. and D.W. King. 2002. "Comparing Library and User-Related Costs of Print and Electronic Journal Collections." *D-Lib Magazine*, 8:10. http://www.dlib.org/dlib/october02/montgomery/0montgomery.html.

Tenopir, C. and D.W. King. 2000. *Towards Electronic Journals: Realities for Scientists, Librarians, and Publishers*. Washington, D.C.: Special Libraries Association.

Notes

1. Funded in part by a grant from the IMLS, NR-00027.

2. This paper includes data from and summarizes the authors' two publications in *D-Lib Magazine* (Montgomery and King 2002 and King and Montgomery 2002) listed in the References.