

1-1-2000

Free Scholarly Electronic Journals: What access do college and university libraries provide?

Michael Fosmire

Purdue University, fosmire@purdue.edu

Elizabeth Young

SUNY Oswego

Follow this and additional works at: http://docs.lib.purdue.edu/lib_research

Fosmire, Michael and Young, Elizabeth, "Free Scholarly Electronic Journals: What access do college and university libraries provide?" (2000). *Libraries Research Publications*. Paper 6.
http://docs.lib.purdue.edu/lib_research/6

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.

Free Scholarly Electronic Journals: What access do college and university libraries provide?

Michael Fosmire
Physics and Earth and Atmospheric Sciences Librarian
Purdue University
fosmire@purdue.edu

Elizabeth Young
Assistant Coordinator, Technical Services
SUNY Oswego
eyoung@oswego.edu

***Abstract:** Results of a survey of the level of access provided to selected free scholarly electronic journals by academic libraries is reported. A list of scholarly journals that are available electronically without any access limitations was compiled, and for each title the number of holding institutions on OCLC and its coverage by major abstracting and indexing services was determined. The twenty-five most popular titles, determined by number of holding institutions on OCLC, were searched on a random sample of library websites and catalogs to provide a separate gauge for access levels provided by institutions. Despite approximately half the titles being indexed by major vendors, including 88% of the top twenty-five, access levels were fairly low and decreased dramatically with the size of the institution. The *Bulletin of the American Mathematical Society* and *Journal of Extension* provide examples of free ejournals with print counterparts. Approximately 1/2 and 1/3 of the institutions, respectively, only provide access to the print versions of those journals (and in the latter case, the print version is no longer produced, so no access to the current issues is provided).*

The spark of this investigation came from a presentation at the 1999 Special Libraries Association Annual Conference, wherein a representative from the Institute of Physics stated “ librarians seem to have trouble figuring out what to do with free things.”¹ This was in reference to their *New Journal of Physics*, an electronic only journal for which there is no subscription fee and no access limitations. The society was wondering why libraries were so slow in cataloging the journal and making it available to their users. Since the *New Journal of Physics* is a general physics journal, published by a reputable source, it would appear to be in the scope of most libraries’ collections. However, a quick search on OCLC yielded a bare handful of institutions that admitted to holdings of the journal. While one could quibble that the *New Journal of Physics* had only published two articles at the time of the conference, the question raised is valid. To what extent are libraries providing appropriate access to free scholarly electronic journals?

Background:

There is no doubt that electronic journals are here to stay, as they offer more convenient navigation between articles, faster time to publishing for authors, and enhanced multimedia content, to name a few advantages. As publishers more fully actualize the electronic journal, soon it will be as insufficient to only offer print journals, as it is to provide only print abstracts and indexes. Tomney and Burton² found that their users had a generally positive attitude toward electronic journals, with ease of access (especially from their desktops) being the most important perceived advantage of the format. A healthy percentage (20-25%) also recognized the above advantages, as well as the potential of having attached comments and a broader dissemination of their work.

While in 1994, Roes³ was able to identify 39 peer-reviewed scholarly electronic journals, by 1996 Harter and Kim⁴ and Hitchcock, Carr, and Hall⁵ found 77 and 115 such titles, respectively. In 1997, ARL’s Directory of Electronic Journals, Newsletters, and Academic Discussion Lists (7th Edition) claimed 1,002

peer-reviewed ejournals.⁶ The growth in electronic journals has been dizzying and testifies to the entrenchment of the medium in scholarly publishing.

The overall electronic publishing environment appears to be healthy, with most major publishers now offering electronic versions of their journals, but what about the free electronic journals? Hitchcock, Carr, and Hall⁷ found 47 out of 83 STM (science, technology, and medicine) titles investigated were free and planned to stay freely accessible. Looking at all disciplines, Harter and Kim⁸ found almost 90% of ejournals were free in his study. With the increase in commercial publishers entering the electronic journal market, the numbers have changed considerably, and our investigation (based on the ARL Directory listings) showed that only 213 out of 1209 (18%) of scholarly journals are free.

The mere existence of free scholarly electronic journals does not automatically mean that libraries should be providing access to them. On some level the journals need to be of good quality and useful. In general, libraries state in their collection development policies that electronic journals undergo the same selection process as print journals.⁹ Typically, selection criteria include several factors, including, for example¹⁰

1. Importance of periodical, as indicated by its inclusion in standard bibliographies and/or "recommended lists."
2. Importance of periodical's subject matter in relation to the University's education goals and the curriculum.
3. Inclusion of the periodical, and therefore access to its articles, in indexes and abstracts (both print and electronic) maintained by the Library.
4. Authoritativeness as reflected by recommendation or adverse criticism by respected authorities.
5. Reputation and standing of the publisher.
6. Price.

In order to determine the importance of electronic journals, which provides some insight into factor 4, Harter¹¹ carried out an impact study. He found, of 38 ejournals that started publication before 1994, 23 were cited by other journals indexed in ISI Citation indexes, including 7 that were cited more than 11 times. Harter found the *Bulletin of the American Mathematical Society* was wildly successful, with over 1500 citations to the journal in 1994. Public-Access computer systems Review (PACS-R) achieved an impact factor percentile of 71% among journals in its subject area, and *Psycology* achieved a 76% ranking. Thus, some free electronic journals have provided high quality content to their disciplines. Since neither PACS-R nor *Psycology* themselves were indexed in the citation indexes, their showing was indeed impressive. Harter did note, however, that the total number of articles written was rather small, so the overall contribution of the journals to the field was less. Another study¹² will focus on the impact on the scholarly literature of the Science, Technology, and Medicine (STM) journals from this study's sample.

Factor 3 was investigated in the present study, which found 42% of the identified free scholarly electronic journals were indexed by a major A+I service (see Discussion section), which also lends credibility to these publications as a non-trivial part of the scholarly literature. Factor 6 is of course not an issue in the present situation. The reputation and standing of the publisher (factor 5) varies considerably with title, with the *American Mathematical Society* (*Bulletin*, *Electronic Research Announcements*, *Notices*), *Institute of Physics* (*New Journal of Physics*), and the *United States Government* (*Emerging Infectious Diseases*) being examples of highly reputable publishers providing free electronic journals. Many of the free electronic journals are hosted by professional societies, although certainly many are just hosted by a group of interested people working in the same subject area. The other criteria are beyond the scope of the present study, although with the wide variety of subject areas covered by the titles, most libraries would seem to have an interest in some titles (factor 2).

Harter's study and the encouraging level of indexing of free scholarly electronic journals, along with our observations on the other selection factors, provide solid motivation for looking at the level of access libraries provide for their users. This study provides one piece of the puzzle of 'appropriate' access to free scholarly electronic journals, the amount of access part. Other research will need to be done to ascertain

more fully the quality of the electronic journals, and thus whether the access reported here is indeed appropriate.

Methods:

First, the term ‘free scholarly electronic journal’ needs to be defined, as there are certainly ambiguities in each word in that phrase. For the purposes of this paper, ‘free’ refers to something that is accessible by anyone with an Internet connection, regardless of a subscription or membership status with any society or publisher. Thus, all of the ‘free, with print’ journals do not qualify. ‘Scholarly’ refers to the more narrow concept of scholarly and peer-reviewed. For example, the very popular and scholarly *Issues in Science and Technology Librarianship*, while very important to Sci-Tech librarians, indexed by A&I services, and free, does not claim to be peer-reviewed.¹³ It thus was not included in this survey. The criteria for a publication being scholarly is then 1) articles have references and a scholarly treatment, and 2) the journal identifies itself that it is peer-reviewed. ‘Electronic journal’ refers to not only electronic-only journals, or even electronic-first journals, but rather, any journal that has an electronic version containing at least as much content as the print, and published approximately simultaneously with the print if not earlier.

For the purposes of libraries providing access to journals with print and electronic versions, access is defined to be access to the electronic version of the journal. Furthermore, the requirement was made that the journal be currently published, so only journals that have published a 1999 issue, or showed other signs of being active, were included in this sample. This led to the exclusion of, for example, the *Katherine Sharp Review* and *PACS-R*, one of which announced it had ceased, and the other of which showed no recent activity at the time of the study.

Candidate journals were drawn from the *Directory of Electronic Journals, Newsletters, and Academic Discussion Lists*, 7th edition. Searching for peer-reviewed journals in all subject areas yielded 1209 titles. Inspection of titles in the database to identify free ejournals narrowed the list to 373 titles. Then attempts were made to access the remaining ejournals, given the URLs in the directory. The authors assessed whether the journal was 1) available from that URL, 2) if it was free, 3) if it was scholarly and peer reviewed, and 4) if it was still being published. Some of the URLs in the directory led to sites with multiple titles, notably the EMIS site¹⁴, which contains over 20 ejournals, so titles were added and subtracted from the original list. The final number of free scholarly electronic journals was 213, much larger than the 47 and 67 quoted in the earlier studies. Table I contains a breakdown of titles by subject area. (insert Table I)

As with any undertaking this large, it is hard to sort out a definitive list of ‘all’ the free scholarly electronic journals. Correct identification depends on the Directory having accurate information about the nature of the journal, including its current link, and the journal’s website having accurate information. While we cannot profess to have compiled a complete list of free scholarly electronic journals, every effort was made to come up with as comprehensive a list as possible. This pool of titles includes, at the very least, a large majority of available titles, and certainly offers a good indication of the overall nature of the information landscape for this genre of materials.

In order to gauge the overall level of access academic libraries offer to these titles, two methods were used. First, for all the qualifying titles, OCLC was searched to find the number of holding institutions (see Table II, column 1). However, it is certainly possible that institutions provide access to a title without registering it with OCLC, thus a simple search on OCLC may underestimate the total level of access actually provided. Possible reasons for not registering include the cost of formally cataloging a title and responsibility for filling ILL requests. Thus, for example, a journal might be located on an ‘Ejournals’ page on the library’s website, but not put in the catalog.

The second gauge, then, was to look at a sample of institutions’ library websites and catalogs to determine whether the institution provides access to the title. As preliminary searching indicated the overall level of access for free ejournals was low, to maximize the chances of success in finding access, only the top twenty-five journals, in terms of number of holding institutions in OCLC, were searched.

The institutions surveyed were selected from the list of institutions in the Carnegie Foundation's *Classification of Institutions of Higher Education*.¹⁵ The universities were selected at random with replacement, so some of the institutions are weighted multiple times in the final analysis. The institutions were first separated by Carnegie Classification type (combining institutions of different levels (I+II)), so that samples of different sized institutions could be analyzed. A sample size (N) of 50 was chosen for each classification level.

For each institution selected, the library's web site was located, and searches were done both in the online catalog and the rest of the web site to locate access to the top twenty-five ejournals. If a title was listed in either the catalog or somewhere else on the website (typically an Ejournal page), it was considered to be accessible. Since only the most popular journals were searched, the results of this survey are an overestimation of access provided for free scholarly electronic journals as a whole. Title searches for the journals on the institutions' websites and catalogs were done in January and February of 2000.

DISCUSSION:

Overall, the number of ejournals that showed holdings in OCLC was rather large. Of the 213 journals investigated, 26% had no holdings in OCLC (N=56), 33% (70) were held by 1-5 institutions, 17% (36) 6-10 institutions, and 24% (51) were held by more than 11 institutions. Holdings for the top twenty-five ejournals is given in Table II. (insert Table II) Another indicator of the relevance of titles is their inclusion in major indexing and abstracting services. 95 journals were found to be indexed in a major A+I service,¹⁶ with MathSciNet indexing the most ejournals with 43 (83% of the free mathematics ejournals in our sample are indexed there). Of the top twenty-five journals by OCLC holdings, 88% were indexed by a major A+I service.

The free scholarly electronic journals represent all subject areas (see Table I). The sciences, engineering and medicine comprise over 60% of the titles identified, but the Arts and Humanities, Education, and the Social Sciences are also well represented. Similarly, the top twenty-five journals cover all the major subject areas, from the Science, Technology, and Medicine literature, through Arts and Humanities, and Social Sciences. Only Business is not represented in the top twenty-five list.

Our in-depth analysis of the top twenty-five free scholarly electronic journals (see Table III) showed that access to journals varies greatly by the size of the institution. (insert Table III) Research level institutions provide access to roughly twice as many titles as the Doctoral Institutions, and nine times as many as Masters level institutions. While some of this difference might be attributable to differences in the scope of the collections of the institutions, due to the broad distribution of subjects covered by the analyzed journals, it is likely that at least some journals would support the curriculum or research interests of the institutions. Nevertheless, seven times as many Doctoral Institutions don't provide access to *any* of the top twenty-five journals, and 14 times as many Masters Institutions don't provide access to any of those titles as Research Institutions.

The Bulletin of the American Mathematical Society provides a striking example of the lack of institutional access to free scholarly electronic journals. If an institution has one subscription to a mathematics journal, it would be the Bulletin. And, if they have a subscription to the print, it follows they would be interested in the online version (which is available free even without a print subscription). However, Table IV shows the percentages of institutions with print subscriptions and those that provide online access to the journal. (insert Table IV) Fully 50% of the Masters Institutions have subscriptions to the print, while only 12% provide access to the electronic version. Electronic access increases dramatically with the size of the institution, in the ratio of 1.3:1.0:0.3 for Research, Doctoral, and Masters.

Furthermore, the high level of electronic access to the Bulletin is helped by the URL to the online version being in the OCLC record for the print product. Several libraries provided access to the online version almost by default by having links in the print record (not all of which URLs were linked, even though most of those catalogs had that capability). With that boost to the access rate, it is surprising that only 54% of institutions with print subscriptions provide access to the online version, despite there being no restrictions on access. In addition, no institution without a print subscription provided access to the online version of

the Bulletin. When such a mainstream free electronic journal has such a hard time reaching the library community, the low rates of access to the electronic-only journals is easily understood.

Some of the other journals also had access levels augmented by other than conscious selection decisions. Blood, Cells, Molecules, and Diseases is a title available on IDEAL through Academic Press (and several institutions volunteered that their access was through the IDEAL site, and not the free site). The Institute of Physics is able to include the New Journal of Physics in their site licensing agreement for their pay periodicals (even then, some institutions that had signed an agreement with IoP for their subscription journals didn't provide access to the New Journal of Physics). Emerging Infectious Diseases is a government document put out by the Center for Disease Control, and links to the online version were often off the government document print record. Thus, of the 5 journals with the largest amount of access by the institutions sampled, only one of them, Electronic Research Announcements of the American Mathematical Society, was not artificially high either by bundling with other journals in a package, or because of links from the print version of the journal.

The Journal of Extension provides an example of a print-based title moving to an entirely online publication. In the case of Research and Doctoral level institutions, 50% more (N=9, 3 respectively) would have provided access to the online version if they had just provided a link to the online version from the print record that often contained the note: "Continued by online version." Indeed, although no Masters level institutions provided access to the online version of the Journal of Extension, 6% provided access to the print version. The journal had obviously met the selection criteria to be in the libraries' collections, but, instead of linking to the online location, libraries just cut off access to the content of the journal when it ceased to be put out in print, providing access to the online version neither in their catalog nor on their website.

Not including the top five journals, the access to the rest of the top twenty-five free electronic journals, most of which aren't well connected to society or commercial publishers, hovers around 20% for Research Institutions, 12% for Doctoral, and 2% for Masters Institutions.

Conclusion:

The genre of free scholarly electronic journals embraces all subject areas and appears to be solidly growing, although the level of access that libraries provide seems to be lower than expected. Although almost half of the electronic journals in our overall sample and 88% of the top twenty-five titles are indexed by a major service, almost no Masters Institutions provide access to these titles, and even the typical Research level institution only provides access to about 1/3 of the top twenty-five titles. The rest of the free scholarly electronic journals are even less accessible through academic libraries. In this case, it appears that the indexing services are substantially ahead of the library community in recognizing the importance of these titles in the scholarly information landscape. The Bulletin of the American Mathematical Society and the Journal of Extension are prime examples of journals that libraries are not providing access to at a level commensurate with their apparent value.

Although, of course, the present study could not investigate all the factors for the selection of new periodical titles by academic libraries, certainly it appears that several worthy journals are not getting the attention they deserve from the library community. Further study, perhaps a survey of libraries asking how certain titles did not meet selection requirements, may shed some light on the low access rates found in this study. One may investigate whether the free scholarly electronic journals are not meeting the selection criteria, whether the stated factors for selection are not being used, or whether a different set of selection factors are being applied to free scholarly electronic journals. For example, are there still technological barriers to providing access to the free scholarly electronic journals, especially among the smaller institutions?

If libraries are to successfully fight the serials crisis that has been prevalent for the past twenty years, librarians need to reward the journals that are trying to provide content at reasonable prices (in this case free) by at least facilitating their usage by making them available in their library catalogs and/or library websites. The New Journal of Physics notwithstanding, where the Institute of Physics aggressively

marketed their free electronic journal in order to get libraries to provide access, we would have to agree with their representative that, generally, we librarians just don't know what to do with free things.

Table I: Breakdown of Free Scholarly Electronic Journals by Subject Area. The percentages add up to more than 100, as interdisciplinary titles were entered under multiple categories.

Subject Area	%of Sample (N)
Physical Sciences	39 (71)
Math	28 (52)
Arts and Humanities	22 (40)
Medicine	21 (38)
Engineering/Computers	12 (22)
Education	10 (18)
Social Sciences	7 (13)
Biological Sciences	7 (12)
Business	5 (10)
Library Science	3 (5)

Table II: Top 25 Free Scholarly Electronic Journals by Number of Libraries with Holdings on OCLC. Indexed journals are indicated in the third column (ATLA = American Theological Library Association Religion Index, Avery = Avery Index to Architectural Periodicals, Bio Abs= Biological Abstracts, Chem Abs= Chemical Abstracts, GSI= General Science Index, RILM = International Repertory of Music Literature Abstracts, WoS = Web of Science).

Title	Number of Holding Institutions on OCLC	% Research I+II Institutions offering access	% Doctoral I+II Institutions offering access	%Masters I+II Institutions offering access	Indexed In
Blood, Cells, Molecules & Diseases	78	52	32	2	Medline, WoS, Chem Abs
New Journal of Physics	69	66	24	2	INSPEC
Educause Review	69	14	16	0	
Electronic Research Announcements of the American Mathematical Society	56	50	14	4	MathSciNet
Emerging Infectious Diseases	54	56	34	24	Medline, WoS, GSI
Bulletin of the American Mathematical Society	41	64	44	12	MathSciNet
Psycology	38	34	10	4	---
Electronic Green Journal	32	28	20	6	PAIS, GSI, Env. Abs.
Architronic	28	20	8	0	Avery
Early Modern Literary Studies	28	16	16	6	MLA
Education Policy Analysis Archives	28	36	12	2	ERIC
Journal of Seventeenth Century Music	28	32	14	2	---
Journal de Theorie des Nombres de Bordeaux	28	14	0	0	MathSciNet

Music Theory Online	27	20	16	4	RILM
Conservation Ecology	25	24	14	6	Bio Abs, WoS, PAIS
Optics Express	25	32	4	0	INSPEC, Chem Abs, WoS
Geometry and Topology	24	30	10	0	MathSciNet
Journal of Artificial Intelligence Research (JAIR)	24	16	20	0	MathSciNet, WoS
Journal of Extension	24	34	14	0	Agricola, WoS, ERIC
Journal of High Energy Physics	23	28	6	0	MathSciNet, WoS
Sociological Research Online	23	18	16	4	PAIS
Electronic Journal of Combinatorics	21	26	12	0	MathSciNet
Electronic Journal of Sociology	21	20	12	0	---
Electronic Transactions on Numerical Analysis	21	20	12	0	MathSciNet
Journal of Buddhist Ethics	21	22	16	2	ATLA

Table III: Average number, minimum, and maximum of the twenty-five free scholarly electronic journals that a library provided access to. The percentages in the Minimum column refer to the percentages of institutions that provided access to none of the top twenty-five scholarly electronic journals.

	Average	Minimum	Maximum
Research I+II	7.7	0 (4%)	23
Doctoral I+II	4.1	0 (28%)	18
Masters I+II	.82	0 (56%)	6

Table IV: Comparison of Print vs Electronic Access to Bulletin of the American Mathematical Society. Numbers are percentages of institutions that provide access to the electronic version of the publication, and the percentages that provide access to the print form of the Bulletin.

	Electronic Access	Print Access
Research I+II	64	92
Doctoral I+II	44	82
Masters I+II	12	50

¹ Jerry Cowhig, comments at the 1999 Physics, Astronomy, Mathematics Vendor Update, 90th Special Libraries Association Annual Conference, Minneapolis, MN.

² Hilary Tomney and Paul F. Burton, "Electronic Journals: A Study of Usage and Attitudes Among Academics." *Journal of Information Science*, 24.6 (1998): 419-429.

³ Hans Roes, "Electronic Journals: A Survey of the Literature and the Net." *Journal of Information Networking* 2.3 (1994): 169-186. Also available at: http://cwis.kub.nl/~dbi/users/roes/articles/ej_join.htm.

⁴ Stephen P. Harter and Hak Joon Kim, "Electronic Journals and Scholarly Communication: A Citation and Reference Study." *Proceedings of the Midyear Meeting of the American Society for Information Science, San Diego, CA, May 20-22, 1996*: 299-315. Also available at: <http://php.indiana.edu/~harter/harter-asis96midyear.html>.

⁵ Steve Hitchcock, Leslie Carr, and Wendy Hall. *A Survey of STM Online Journals 1990-95: The Calm Before the Storm*. Available at: <http://journals.ecs.soton.ac.uk/survey/survey.html#scope>.

⁶ Mogge, Dru W. (Ed.) *Directory of Electronic Journals, Newsletters and Academic Discussion Lists* Foreward (<http://db.arl.org/foreword.html>).

⁷ Hitchcock, *et al.*, *ibid.*

⁸ Stephen P. Harter and Hak Joon Kim, "Accessing Electronic Journals and Other E-Publications: An Empirical Study." *College and Research Libraries* 57 (September 1996): 440-456.

⁹ Elizabeth Parang and Laverna Saunders, *Electronic Journals in ARL Libraries: Issues and Trends, SPEC Kit #202*. (Washington DC: Association of Research Libraries, 1994). The SPEC Kit includes copies of collection development policies for electronic journals from seven major academic institutions. All of those statements of collection development policy stated that selection policies were the same as for print journals.

¹⁰ Elizabeth Futas, *Collection Development Policies and Procedures*, 3rd Ed. (Phoenix, AZ: Oryx, 1995): 306. The quoted passage is the collection development policy for serials at Hawaii Pacific University. All of the institutions in this text had similar criteria for selection, with this example being the most succinct presentation of the criteria.

¹¹ Stephen P. Harter, "Scholarly Communication and Electronic Journals: An Impact Study." *Journal of the American Society for Information Science*, 49.6 (1998): 507-516.

¹² Michael Fosmire, "Free Scholarly Electronic Journals in the STM Literature: An Impact Study." *Issues in Science and Technology Librarianship* (submitted for Summer 2000 issue).

¹³ At the time of this study, ISTL was not peer-reviewed. However, as of the Summer 2000 issue, it will have a peer-reviewed section.

¹⁴ European Mathematical Information Service "The Electronic Library of Mathematics: Mathematical Journals." (<http://www.emis.de/journals/index.html>).

¹⁵ Carnegie Foundation for the Advancement of Teaching. *A Classification of Institutions of Higher Education, 1994 Edition*. Available at:
<http://www.carnegiefoundation.org/OurWork/Classification/CIHE94/classification1994.htm>

¹⁶ To determine which A+I services index these journals, *Ulrich's international periodicals directory*, 38th Ed. (New York: Bowker, 2000) was consulted, as were the following indexes: MathSciNet, INSPEC, MLA, SocioFile, PsycInfo, CINAHL, Agricola, Medline, EconLit, Wilson's: Humanities Abstracts, Social Science Abstracts, Business Abstracts, IIMP, PCI, GeoRef, ATLA, Business And Industry Index, Criminal Justice Abstracts, and Web of Science. Not all journals were listed in Ulrich's, and Ulrich's did not necessarily contain all the indexers of a journal.