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## Cross Country Comparison of Scholarly E-Reading Patterns in Australia, Finland, and the United States

Carol Tenopir  
*University of Tennessee - Knoxville, ctenopir@utk.edu*

Concepción S. Wilson

Pertti Vakkari

Sanna Talja  
*University of Tampere, sanna.k.talja@uta.fi*

Donald W. King  
*donaldwking@gmail.com*

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# CROSS COUNTRY COMPARISON OF SCHOLARLY E-READING PATTERNS IN AUSTRALIA, FINLAND, AND THE UNITED STATES\*

*Carol Tenopir, Concepción S. Wilson, Pertti Vakkari, Sanna Talja, Donald W. King*

Surveys of academic staff in Australia, Finland, and the United States from 2004-2007 reveal reading patterns of e-articles by academics that can be used to measure the purpose and value of e-reading and to demonstrate the value of library-provided electronic journal collections. Results can also be used to compare differences across subject discipline, age, and national boundaries, and how the decisions that libraries make influence reading patterns.

The surveys used a variation of the critical incident technique to focus on the last e-article read, whether from the library collection or from elsewhere. Readings from e-journals and articles provided by libraries were more often for the purpose of research than were readings from other sources; were rated as highly valuable to that purpose; and have many reported values, including stimulating new ideas. Academics who published more also read more. Although there were some minor variations in e-reading patterns among the countries, most differences in reading patterns resulted instead from differences in subject discipline. Personal characteristics of the reader, including age and status, had much less influence on e-reading habits.

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**Carol Tenopir, Professor, School of Information Sciences, University of Tennessee, USA, ctenopir@utk.edu**

**Concepción S. Wilson, Visiting Professor, School of Information Systems, Technology, and Management, University of New South Wales, Australia, c.wilson@unsw.edu.au**

**Pertti Vakkari and Sanna Talja, Professors, Department of Information Studies, University of Tampere, Finland, Pertti.Vakkari@uta.fi; sanna.k.talja@uta.fi**

**Donald W. King, Distinguished Research Professor, Graduate School of Information and Library Science, University of North Carolina-Chapel Hill, USA, donaldwking@gmail.com**

## **INTRODUCTION**

**E**-journals and journal article databases now form a large part of university libraries' periodical collections. E-articles are also available from other sources, including subject repositories, institutional repositories, author web sites, and open access journals. Scholars who are affiliated with universities that have substantial electronic collections and internet infrastructure thus have the potential to access more journals and scholarly articles than ever before. This unprecedented access is true in many nations with developed infrastructure, but little is known about how reading patterns may differ among academics in different nations.

This paper reports a survey of academics (faculty members) from several universities in Australia, Finland and the United States aimed at determining the amount of e-reading, time spent reading, sources of e-article readings, purpose of reading, and the value of reading. Using consistent questions, following the form and types of questions asked since 1977 in surveys of scientists by Tenopir and King (2000), allows cross-national comparisons as well as comparisons by demographic characteristics such as subject discipline, age, and rank. This paper reports on the results for academic staff/faculty.

## **RELATED STUDIES**

Three major literature reviews have summarised research studies from the past fifty years that measure journal reading and, more recently, the transition from print to electronic scholarly resources. King and Tenopir (2001), Tenopir (2003) and Rowlands (2007) describe many national or regional studies that found widespread adoption of electronic resources by academics around the world in situations where the infrastructure is adequate and high quality resources are readily available. Barriers to adoption of e-journals are mainly related to limited access to core resources (Vakkari, 2006) and are often site-specific, such as lack of training and poor computing infrastructure (Raza and Upadhyay, 2006).

Given conditions of adequate infrastructure, training, and library e-collections, few cross-national differences were found or anticipated (Tenopir, King, Spencer and Wu, 2009); differences in reading behaviors instead may be due to other factors. Collaborating researchers in Europe, for example, make a strong theoretical case for future studies to consider the cultural differences within and between disciplines (Fry and Talja, 2004). Talja and Maula (2003) and more recently, Tenopir and others (2009) have explored subject discipline differences in reading patterns.

National studies especially relevant to this paper include studies of Finnish academics, who are surveyed from time to time by the FinElib consortium (Vakkari and Talja, 2006), reading patterns of Australian academics (Wilson and Tenopir, 2008), and journal seeking and reading patterns of U.S. academics in five universities (King, Tenopir, Choemprayong and Wu, 2009). In addition to these studies and those described in the three major literature reviews mentioned above, recent studies of academics of the Technological Educational Institute of Thessaloniki in Greece (Korobili, Tilikidou and Delistavrou, 2006); academic staff of the Consortium of Academic Libraries of Catalonia in Spain (Borrego, Anglada, Barrios and Comellas, 2007); physicists, chemists and pathologists in universities and research institutes in Japan (Kurata, Matsubayashib, Mine, Muranushi and Ueda, 2007); medical researchers from 80 medical schools in Japan (Kurata, Mine, Morioka, Sakai, Kato and Ueda, 2009); registered users of the *Electronic Journal of the University of Malaya* (Zainab, Huzaimah and Ang, 2007); and humanities researchers, social scientists and scientists from nine universities in the Netherlands (Voorbij and Ongering, 2006) provide a growing international picture of the shift from print to electronic journals among scholars, with reading from both print and electronic journals still an important part of the scholarly enterprise.

## METHOD

The surveys reported here were conducted from late 2004 through May 2007. Two universities in Australia, five in the United States, and a nationwide survey of Finnish academics resulted in a total return of over 2,000 academic staff/faculty responses (Table 1).

The surveys in Australia and the U.S. asked respondents to comment on readings, whether from print or electronic sources, while the Finland survey asked questions only about use of e-sources. For purposes of comparison, only those portions of the Australian and U.S. responses that could be determined to be from e-sources are included in this analysis.

All surveys were distributed electronically to academics through an e-mail cover letter from the librarian at their university, or by marketing the surveys through university libraries' homepages. In some of the U.S. universities a paper copy was also available. Responses were captured or entered into an SPSS data file for analysis.

Table 1: Survey Dates and Responses

| Survey Location                              | Date           | Academics/<br>Faculty<br>Response | Response<br>e-sources |
|--|----------------|-----------------------------------|-----------------------|
| University of New South<br>Wales             | Sept-Nov 2004  | 230                               | 126                   |
| <b>Australia</b> University of<br>Queensland | May 2005       | 151                               | 82                    |
| <b>Australia Total</b>                       |                | <b>381</b>                        | <b>208</b>            |
| <b>Finland (Nationwide)</b>                  | April-May 2007 | 491                               | 491                   |
| Research University #1                       | Oct-Nov 2005   | 332                               | 129                   |
| Master's Level #1                            | Oct-Nov 2005   | 102                               | 40                    |
| Research University #2                       | Oct-Nov 2005   | 415                               | 247                   |
| <b>U.S.</b> Master's Level #2                | Oct-Nov 2005   | 47                                | 13                    |
| Research University #3                       | Oct-Nov 2005   | 411                               | 172                   |
| <b>U.S. Total</b>                            |                | <b>1307</b>                       | <b>601</b>            |
| <b>Total (All three countries)</b>           |                | <b>2179</b>                       | <b>1300</b>           |

Respondents were asked several demographic questions, notably concerning their subject discipline, academic rank or level, and age. One general recollection question was asked, namely:

“In the past month, approximately how many scholarly articles [electronic articles in the Finnish survey] have you read? Reading is defined as going beyond the table of contents, title, and abstract to the body of the article.”

The remainder of the questions focused on the specific incident of the last article reading. This variation of the critical incident technique has been used for many years in surveys of reading patterns by Tenopir and King (2000). The critical incident technique, first introduced by Flanagan (1954) provides a second stage random sample of readings beyond the sample of readers that allows detailed analysis of such things as the purpose and value of readings. By focusing on a recent reading, problems relating to recall are reduced. All common questions are listed in the Appendix.

## LIMITATIONS

Some readings from the Australian or U.S. surveys may have been omitted if we could not adequately determine whether the source was print or electronic. Surveys were conducted over a two and one-half year timeframe. Although all of the survey recipients at all of the universities had access to substantial library-provided e-journal collections at the time of each survey, some changes in access or attitudes may be attributable to the passage of time between surveys. All answers are self-reported and, therefore, should be considered estimates. Time

spent reading, number of article readings, etc. are all estimated by the respondents to the best of their recollections. The academic institutions surveyed and the respondents from these institutions were assumed to be typical representatives within each country.

## RESULTS AND DISCUSSION

Faculty members/academic staff in all three countries undoubtedly read from both print and electronic sources. In the United States, for example, on average over half of all readings are from electronic resources and in Australia two-thirds are from electronic sources. The Finnish survey only asked about e-reading; hence, only e-article reading is reported in this paper when comparing the three countries. It may be expected that the total number of article readings was approximately a third to nearly one-half greater than the e-readings reported here when readings from print journals are included. Note that reading from electronic sources does not mean that the final form of reading is on the screen. In a majority of cases, e-articles were printed out for final reading.

### Amount of E-Reading

In all three countries, academics reported many e-readings per month: on average, 14.9 in the U.S., 15.4 in Finland, and 17.1 in Australia (Table 2). Based on the monthly averages of e-reading, the amount of e-readings on average per academic per year is close to 179 in the U.S., 185 in Finland, and 205 in Australia. In Finland, where all academics have access to the national e-journal licenses from their FinELib consortia, it was assumed that most of these scholarly readings came from FinELib holdings. In the U.S. and Australian surveys, more detailed questions about the reading source were asked and responses showed that nearly half (103 of 208) of the e-readings in Australia came from library resources, and over two-thirds (412 of 601) of the e-readings in the U.S. came from libraries. Other substantial sources for e-readings included the open web (14.8% in the U.S. and 39.9% in Australia) and, to a lesser degree, personal subscriptions (6.5% in the U.S. and 10.6% in Australia). In all countries, the e-resources provided by the library or the library consortium were the most important sources for e-readings by academics.

Table 2 shows the average number of electronic readings per month by country and by academic standing. Because the academic titles are different in each country, the groupings may account for some of the differences within each category. In all countries, the number of reported readings differed among individuals, with a range of between zero and over 100 e-articles reported as being read in the past month. On average, Australian academics, followed by Finnish faculty members, reported the greatest number of e-readings, although academics from all three countries made a substantial investment of time in e-readings.

Table 2: Average Monthly E-Readings by Academic Rank

| Grouped Academic Ranks                               | Australia |           | Finland |           | U.S. |           |
|--|-----------|-----------|---------|-----------|------|-----------|
|  | Mean      | Std error | Mean    | Std error | Mean | Std error |
| I. Professor   | 18.7      | 5.38      | 19.6    | 1.09      | 16.0 | 1.39      |
| II. Associate/<br>Assistant Professor/<br>Researcher | 24.5      | 6.68      | 15.7    | 1.20      | 14.8 | 0.93      |
| III. Instructor/<br>Lecturer/Adjunct                 | 12.2      | 1.06      | 11.2    | 1.87      | 13.0 | 1.93      |
| Other  | 13.8      | 2.06      | N/A     | N/A       | 12.2 | 1.55      |
| <b>Total</b>   | 17.1      | 2.24      | 15.4    | 0.78      | 14.9 | 0.70      |

*Note: Tests for statistical significance were performed for all the survey results used in this paper; these can be obtained from the authors. However, they have been omitted from the text for ease of reading*

In Finland, the number of electronically obtained article readings was significantly associated with academic status. Both professors and associate/assistant professors reported significantly more article readings than lecturers. Lecturers' teaching loads are typically higher than that of other academic positions, which leave less time for reading research publications; in addition, lecturers may not have the research expectations of the other two ranks. In the U.S. and Australia, the number of readings was not significantly associated with academic status.

It is often hypothesised (yet rarely supported by data) that younger faculty members may be more likely to read electronic articles, while older ones rely more on print sources. Age of reader may also be a reflection of academic rank and career stage, so no age-related results can be definitive. Age was **not** statistically significantly associated with the number of electronic readings in the three countries (Table 3).

Table 3: Age of Respondents and Reported Average Number of E-Readings Per Month

| Age         | Australia | Finland | U.S. |
|-------------|-----------|---------|------|
| 18-25       | 18.0      | 18.9    | 11.0 |
| 26-35       | 22.5      | 16.8    | 12.6 |
| 36-45       | 12.5      | 13.5    | 14.9 |
| 46-55       | 13.2      | 15.5    | 16.3 |
| 56-65       | 11.0      | 14.7    | 14.3 |
| 66 or above | N/A       | N/A     | 19.2 |

In the U.S. and Australia, where respondents were asked about reading from both electronic and print sources, there was a definite age-related trend, with older readers more likely to read from a balance of print and electronic resources (Table 4).

Table 4: Source (%) of Readings (Print or Electronic) by academics in Australia and the U.S., by Age of Reader (n=1251)

| Age      | Print | Electronic |
|----------|-------|------------|
| Under 30 | 13%   | 87%        |
| 31-40    | 31%   | 69%        |
| 41-50    | 44%   | 56%        |
| 51-60    | 46%   | 54%        |
| Over 60  | 50%   | 50%        |

In Australia, academic rank II is closely aligned with middle-level academics (Table 2); this group on average read twice as much as junior academics in rank III and also considerably more than senior academics in rank I. In Table 3 this spread was repeated in the number of e-readings by age: the 26-35 age cohort, generally early career/middle-level academics, read nearly twice as much as older academics aged 36-65. The middle-level academic rank and 'up to 40' age cohort represent academics who are keen for promotion, spend more time reading mostly for research (see Table 8 below), and largely prefer reading e-articles (see Table 4).

Subject discipline most likely has an effect on amount of reading and other reading patterns, with humanities faculty members generally reporting reading fewer e-articles per month than faculty members in other disciplines (Table 5). In Finland, academic discipline was significantly associated with the number of electronic article readings. Faculty members in medicine read more than their colleagues in other disciplines. The difference was significantly greater compared to humanities and social sciences. Humanists read significantly fewer electronic articles than their colleagues in other disciplines. They read on average only 6.8 articles compared to 25.5 items read by the scholars in medicine.

Table 5: Average Number of Scholarly E-Article Readings per Month by University Faculty Members by Subject Discipline

| Discipline      | Australia | Finland | U.S. |
|-----------------|-----------|---------|------|
| Humanities      | 12.1      | 6.8     | 7.0  |
| Social Sciences | 12.5      | 14.0    | 11.3 |
| Sciences        | 11.9      | 18.3    | 16.5 |
| Engineering     | 20.4      | 18.6    | 14.4 |
| Medicine        | 22.1      | 25.5    | 20.9 |
| <b>TOTAL</b>    | 17.1      | 15.3    | 14.9 |

In the U.S., academic discipline was also significantly associated with the number of article readings. As in Finland, U.S. medical scholars read on average 20.9 articles, significantly more than their colleagues in the disciplines of social science (11.3), humanities (7.0), engineering (14.4), and science (16.5). While U.S.

humanities scholars read significantly fewer articles than their counterparts in the disciplines of medicine, engineering, and science, the difference in number of readings between humanities and social science was not statistically significant.

In Australia, academic discipline was *not* significantly associated with the number of article readings. However, the results do provide some evidence that scholars from medicine and engineering disciplines read nearly twice as much as scholars from other disciplines.

Part of the differences in article readings among academic disciplines can be accounted for by the fact that a greater percentage of science, technology, medicine, and social science journals are available in electronic form (Vakkari and Talja, 2006). Another reason is that humanities scholars read relatively fewer journal articles (even from print journals) than their science counterparts, relying on books and primary documents more and articles less. In the U.S. and Australian surveys, the humanities faculty members reported an average of 13 article readings per month from either print or electronic sources, compared to an average total of 29 readings for science academics.

In Finland and the U.S., academics who publish more also read significantly more; however in Australia, where academics reported the highest amount of reading overall, there was no significant correlation found between the reported number of e-readings and the number of publications. In Finland, the total number of all scholarly items published was significantly associated with the number of electronic article readings. There were significant correlations between readings and publishing in journals, conference proceedings, and monographs, but not for text books or manuals. In the U.S. the total number of all scholarly publications was also significantly correlated with the number of e-article readings. The number of publications in refereed journals was significantly correlated with the number of article readings; however, the numbers of article in the other publication types (that is, non-refereed journals, conference papers, books and chapters in books) were *not* significantly correlated to article readings.

### Where E-Reading took place

There were some differences across countries in where e-reading took place. In Australia, Finland, and the U.S., the office or laboratory was, however, by far the most common place for reading e-articles, with home a distant second and other places only minimally popular. The library was not a place for reading e-articles in any of these countries, even though most of these articles were retrieved online through the libraries' e-collections. Within "other", "while travelling" was a notable choice only of Australian academics, with 6.7% of readings done while on the road (Table 6).

Table 6: Location of E-Readings

| Reading Location: (%)  | Australia | Finland | U.S.  |
|------------------------|-----------|---------|-------|
| Office (or Laboratory) | 60.1%     | 75.7%   | 66.2% |
| Home                   | 26.1%     | 19.9%   | 26.8% |
| Library                | 3.9%      | 0.8%    | 1.5%  |
| Other                  | 9.9%      | 3.7%    | 4.3%  |

In Finland, academic status was significantly associated with reading place, with 82% of e-readings by assistant professors, 68% of e-readings by lecturers, and 65% of e-readings by professors done in the office. In the U.S. and Australia, academic status was not significantly associated with the location of e-reading.

In Finland and Australia, there was *no* statistically significant association between age and location of e-reading. In the U.S., however, age was significantly associated with e-reading location, with 74% of readings by academic staff in the age group of 26-35 done at the office or laboratory, followed by the 36-45 age group (68%), 56-65 age group (67%), and 46-55 age group (64%). Only 48% of e-readings by scholars older than 66 were done at the office and laboratory, and just as many of their e-readings done at home.

In the U.S. and Australia, academic discipline was significantly correlated with reading location. In the U.S. 85% of readings by engineering faculty and 80% of readings by science faculty occurred at the office or laboratory, while only 40% of humanities readings, 58% of social science readings, and 64% of medical/health readings occurred at the office or laboratory. Over half (55%) of humanities readings by U.S. faculty were done at home, which was significantly higher than the other disciplines (only 13% of engineering and 16% of sciences readings were at home.)

In Australia, readings by science academics were more likely to be at their school or department office (75%), followed by readings by scholars in medicine and health (73%), social sciences (59%), humanities (53%), and engineering/technology (44%). Humanities scholars are the most frequent users of the university library (13.3%) as an e-reading location. More readings by scholars in social science (35%) and engineering/technology (36%) are from home, compared with readings by scholars in humanities (13%), medicine (20%), and science (17%). Humanities scholars are more likely than the other disciplines to read while traveling (20%). Reading in the office or laboratory was perhaps practiced more by academics in middle or junior ranks (see Table 2, ranks II and III) in those disciplines engaged in experimental scientific or medical research; those academics aged 35 or younger reported on average over 20 e-readings per month (see Table 3) and at least some of the e-readings are likely to be on computer screens.

#### How E-Articles Were Found

Not surprisingly, searching was overwhelmingly the most popular method for finding electronic articles, but browsing, following citations and consulting colleagues were also important ways to locate e-articles (Table 7). (In Australia,

due to limitations of the questionnaire design, only browsing, searching, and some other methods could be differentiated by electronic and print. Therefore, in selecting electronic source, only browsing and searching were included and cases with following citations and consulting colleagues were excluded.)

Table 7. How E-Readings Were Found

| <b>Method of Finding: (%)</b> | <b>Australia</b> | <b>Finland</b> | <b>U.S.</b> |
|-------------------------------|------------------|----------------|-------------|
| Browsing                      | 39%              | 15%            | 23%         |
| Searching                     | 49%              | 65%            | 34%         |
| Citations                     | N/A              | 10%            | 17%         |
| Colleagues                    | N/A              | 6%             | 18%         |
| Other                         | 12%              | 4%             | 8%          |

In Finland and Australia, none of the independent variables of academic status, age, or discipline was associated with the search method used for finding electronic articles and in the U.S., neither age nor discipline were significantly correlated with the search method. In the U.S., however, academic status and degree were both significantly correlated with the search method. Professors were more likely to use their colleagues to find articles (19.4%), compared to assistant professors (19%) and lecturers (10%). More lecturers (44%) used searching to find articles, than professors (27%) or assistant professors (35%).

### Principal Purpose of E-Reading

Academic staff read e-articles for many reasons, including research, teaching, keeping up-to-date, and other reasons. Research is by far the most common reason for reading scholarly articles in all three countries (Table 8).

Table 8: Principal Purpose of E-reading

| <b>Principal Purpose</b> | <b>Australia</b> | <b>Finland</b> | <b>U.S.</b> |
|--------------------------|------------------|----------------|-------------|
| Research                 | 64% (133)        | 68% (346)      | 53% (319)   |
| Teaching                 | 11% (22)         | 11% (58)       | 20% (119)   |
| Keeping up to date       | 9% (16)          | 12% (60)       | 5% (29)     |
| Other                    | 16% (34)         | 9% (48)        | 20% (119)   |

In Finland, the U.S., and Australia, academic status is significantly associated with the main purpose of use. In Finland, 76% of readings by assistant professors, 62% of readings by professors, and 52% of readings by lecturers were for research. Reading for teaching was the reverse: 7% of readings by assistant professors, 12% of readings by professors, and 22% of readings by lecturers were for teaching. These findings may be related to the heavier teaching load and stronger teaching orientation of lecturers.

In the U.S., 61.3% of readings by assistant professors, 51% of readings by professors, and 33% of readings by lecturers were for research, whereas 20% of readings by assistant professors, 18% of readings by professors, and 26% of readings by lecturers were for teaching. The U.S. surveys included three research intensive/extensive universities and two master's level universities. Although the latter two universities represent only a small percentage of the total responses (53 of 601 e-reading responses) and, therefore, do not alter the final results greatly, there was a significant difference in purpose of e-readings between the categories of institutions. A slightly greater number of e-readings at the three research-level institutions were for research: 55% (296) of total e-readings, compared to 44% (23) at the two master's level institutions. In contrast, 29% (15) of the e-readings were for teaching at the master's level universities, compared to 19.5% (104) for teaching in research level institutions.

In Australia, readings by academics in the top two ranks, I (74%) and II (71%), were most often for research, compared to readings by junior academics in rank III (59%). Readings by junior academics are more often for teaching (21%) than those of other academic ranks (see also Table 2).

The purpose of e-reading also varied with the age of the reader. In Finland and the U.S., age was significantly associated with the principal purpose of reading. Readings by younger scholars were more likely to be for research than readings by their older peers, whereas readings by older scholars were more likely to be for teaching. More readings by those in the age group of 26 to 45 were for research, while readings for research declined after age 46 and readings for teaching increased. In Australia, a scholar's age was not significantly correlated with the principal purpose of reading.

In all three countries, the purpose of reading was significantly correlated with the method of finding articles. In Finland, the most commonly used method for finding articles for keeping up to date was searching (43 %) followed by browsing (30 %), and other means (13 %). Most articles read for research were found by searching (67%), followed by browsing (13 %), and by following citations (11 %). E-readings for teaching in Finland were also most often found by searching (63 %), followed by browsing (16 %), and consulting colleagues (11 %).

In the U.S., the most frequently used method for finding e-readings for research was searching (33%), followed by browsing (25%), following citation (21%), and consulting colleagues (16%). Readings for teaching were most often found by searching (35%), followed by browsing (26%), consulting colleagues (20%), and following citations (13%). In the U.S., readings for keeping up to date were also most often found by searching (28%), followed by browsing (24%), and from colleagues (21%). For writing proposals and reports most articles were found by searching (46%), with following citations next most common (23%), then by browsing (10.8%).

In Australia, the most frequently used method for finding e-readings for research was also searching (53%), followed by browsing (37%). Readings for teaching were most often found by browsing (46%), more so even than searching (41%).

Also in contrast to the U.S., readings for current awareness were most often found by browsing (56%) by Australian academics, followed by searching (33%). For writing proposals, searching (57%) was more common than browsing (38%).

## CONCLUSIONS

When university libraries provide access to substantial e-journal collections and adequate infrastructure, academic staff read many e-articles that help improve their research, teaching, and current awareness. They use many methods to find these articles, including browsing, searching, following citations, and consulting colleagues. In all countries, e-articles were an integral part of the academic process, with multiple purposes for reading and multiple methods used for locating articles. Although there were some differences in the amount of reading and patterns of reading among academic scholars in the three countries of Australia, Finland, and the United States, most differences can be accounted for by the academic discipline of the reader. Academic rank/status, productivity and age account for some differences as well. Some differences, such as location when reading, do seem to be country-dependent. Finnish faculty members, for example, were more likely to do their e-reading in their offices or laboratories rather than at home.

The cross-country analysis reported here showed that for academic staff/faculty in Finland, the U.S. and Australia:

- the number of electronic article readings varied by academic status: senior and middle level academics read more articles than lecturers or junior level academics.
- age did not explain adoption of e-resources, but older readers used both print and electronic resources in a more balanced manner.
- both e-article and article reading patterns varied by discipline: scholars in medicine and engineering read more articles than scholars in other disciplines; humanities and social sciences scholars read both books and journal articles, which explained in part their lower use of e-journal articles.
- publication productivity was associated with the number of electronic article readings in Finland and the U.S.

There are some cross-country differences, however. In Australia, for example, no correlation was found between publication activity and amount of e-reading, and overall Australian academics reported the highest amounts of e-reading. Another significant difference between the countries emerged in the higher use of searching by Finnish scholars in locating e-articles. Finnish academics were also less likely to do e-readings at home. These differences are interesting, and clearly merit further exploration.

It is clear that the decisions that libraries or library-consortia make do influence some reading patterns. One university in Australia, for example, had purchased significant numbers of e-journal backfiles prior to the survey. Consequently the

academic staff at that university reported more readings of older articles in electronic form. In Finland, the national consortium FinELib licenses e-journal collections and makes them available to academics nationwide. It is likely, therefore, that readings from print resources were lower overall, as e-resources were available uniformly to all Finnish universities.

The number of articles read on average continues to increase as electronic journals become more widely available. At the same time, the average time spent per reading is decreasing (see Tenopir and King surveys (2000, 2004) conducted since 1977). Libraries and publishers, therefore, must continue to find ways to help readers locate and obtain the most relevant and high quality articles quickly and efficiently.

When university libraries provide access to substantial e-journal collections and adequate infrastructure, academics are likely to read many more e-articles that may help improve their research, teaching and current awareness. Academics use many methods to find these articles, including browsing, searching, following citations, and consulting colleagues. In all countries, e-articles were an integral part of the academic process, with multiple purposes for reading and multiple methods used for locating articles.

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## APPENDIX

### Questions common to all surveys

#### 1. *Recollection of amount of reading:*

U.S. and Australia: In the past month (30 days/4 weeks), approximately how many scholarly articles have you read? Articles can include those found in journal issues, Web sites, or separate copies such as preprints, reprints, and other electronic or paper copies. Reading is defined as going beyond the table of contents, title, and abstract to the body of the article.

Finland: How many scholarly articles that you have obtained in electronic form have you read during the last month (4 weeks)? Reading means going beyond the table of contents, title and abstract to the body of the article. Estimate the number:

#### 2. *Critical incident of last article reading:*

2.1 U.S. and Australia: How did you find the last article you read?

Finland: How did you find the last e-journal article you read? Both: Choose one of the following (specific names of systems or methods that can be consolidated into browsing, searching, following citations, from a colleague, or other)

2.2 Where did you use/read the last e-journal article you read (reading location)?

2.3 For what purpose have you used or will you use the information obtained from the article primarily?

To keep up with developments in my own field.

For research and/or development work.

For some other private task (e.g. writing a funding application).

For teaching and counseling.

For preparing a dissertation

For some other studies

Other, what?

### 3. *Demographics:*

Age, gender, academic rank, academic discipline, highest degree earned, year of last degree, number and type of publications authored

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