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Queensland University Academic Staff Journal Reading Patterns

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Available at: https://works.bepress.com/carol_tenopir/89/

University of Queensland Academic Staff Journal Reading Patterns

Factual Summary of Results of the Survey Conducted May 2005

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Introduction.

This is a question-by-question analysis of the results of the University of Queensland survey of Academic Staff, conducted May 2005 (see Appendix for the Questionnaire.) Results that require further analysis or information about the library context for complete analysis are noted. A preliminary comparison with Tenopir & King survey data of U.S. universities is included, but further comparisons, both with U.S. universities and with the University of New South Wales, will be included in subsequent articles for publication. This report is for internal use at UQ or may be used to prepare presentations and journal articles.

In May 2005 an email message from the University of Queensland Director of Libraries, with an embedded link to a questionnaire housed on a University of Tennessee server, was sent to a random sample of 1000 academic staff members (out of a total full-time academic staff of approximately 2100) at 3 UQ campuses— the main campus at St. Lucia, as well as satellite campuses at Gatton and Ipswich. In addition, the questionnaire was linked on the UQ library website.

We received 151 responses, so, if we assume all of the respondents came from the invitation sent to the random sample of staff, the response rate is 15.1% (151 of 1000). This compares to 23.3% at University of New South Wales.

Demographics of Respondents.

Work Responsibilities.

Queensland staff respondents reported spending much more time in research and research training than all the other university responsibilities. Respondents who reported more than 50% of time spent in research and research training (46.4%, 64 of 138) greatly outnumbered those reporting more than 50% time spent in teaching/learning (8.7%, 12 of 137), management/resources (3.6%, 5 of 137), community partnerships (0.7%, 1 of 137), consulting/advising (2.2%, 3 of 137), or other (0.7, 1 of 137).

On the other hand, the number of respondents who reported no time spent in research and research training (2.9% or 4), was much smaller than those who reported spending time with other responsibilities. The percentage of respondents that reported spending time with other responsibilities ranged from 24.8% to 85.4% of total participants. Teaching/learning appeared to be the second major responsibility taking up respondents' time-- 41.1% respondents spent more than a quarter of all time in teaching/learning. (See Table 1.)

Table 1. Percentage Distribution of Work Time

| Percentage of Work Time | Research & Research Training (N = 138) | Teaching & Learning (N = 137) | Management & Resources (N = 137) | Community Partnerships (N = 137) | Consulting/ Advising (N = 137) | Other (N = 136) |
|--------------------------------|--|-------------------------------|----------------------------------|----------------------------------|--------------------------------|-----------------|
| 0% | 2.9% (4) | 24.8% (34) | 35.8% (49) | 78.1% (107) | 64.2% (88) | 85.4% (117) |
| 1~10% | 5.1% (7) | 17.5% (24) | 33.6% (46) | 19.0% (26) | 25.5% (35) | 7.3% (10) |
| 11~25% | 13.0% (18) | 17.5% (24) | 17.5% (24) | 1.5% (2) | 5.8% (8) | 4.4% (6) |
| 26~50% | 32.6% (45) | 31.4% (43) | 8.8% (12) | 0.7% (1) | 2.2% (3) | 1.5% (2) |
| 51~75% | 16.7% (23) | 8.0% (11) | 2.9% (4) | 0.7% (1) | 1.5% (2) | 0% (0) |
| 76~100% | 29.7% (41) | 0.7% (1) | 0.7% (1) | 0% (0) | 0.7% (1) | 0.7% (1) |

Location and Academic Discipline.

We asked respondents to “indicate your school or your professional field” in an open ended text box. Not surprisingly, we received a variety of responses, which we then had to group in a meaningful way. We chose to group the responses in two different ways—1) by UQ Faculty and 2) by general academic discipline that corresponds to our U.S. survey data. Because this is an open-ended question, we can group the responses post-hoc into more specific academic disciplines as well.

Table 2 shows the responses grouped by UQ Faculties (approximated from the open-ended responses for those that responded to this question). Participants from health sciences accounted for the largest percentage of respondents (23.7% or 31 of 131 respondents). Respondents from engineering, physical sciences & architecture came next (21.4%, 28). Three groups each reported totals over 10%: social & behavioural sciences (16.8%, 22), BACS (Biological & Chemical Sciences) and Natural Resources (15.3%,

20), and business, economics & law (11.5%, 15). Respondents from arts and other faculties or institutions accounted for only 11.4% in total. Comparing this with the corresponding percentages for the total UQ population, shows our respondents are typical, although we have a higher percentage of Social & Behavioural Sciences responses and a lower percentage of BACS & Natural Resources responses than would be expected.

Table 2. UQ Faculties (Respondents and Total Population)

| UQ Faculty | Respondents # (%) | Population* # (%) |
|---|----------------------|----------------------|
| Arts | 13 (9.9) | 158 (7.6) |
| BACS & Natural Resources | 20 (15.3) | 457 (22.0) |
| Business, Economics & Law | 15 (11.5) | 216 (10.4) |
| Engineering, Physical Sciences & Architecture | 28 (21.4) | 478 (22.9) |
| Health Sciences | 31 (23.7) | 420 (20.2) |
| Social & Behavioural Sciences | 22 (16.8) | 191 (9.2) |
| Other | 2 (1.5) | 158 (7.6) |
| Total | 131 (100) | 2078 (100) |

* Figures for total population taken from the UQ website
<http://www.mis.admin.uq.edu.au/studentLoad.shtml>

In further analysis, results across all Faculties at UQ can be normalized by weighting responses according to these percentages.

Regrouping by general subject discipline that corresponds to our surveys of U.S. universities is shown in Table 3. By this categorization, the largest groups of respondents came from social sciences (including business and law) (30.5%, 40 of 131) and other sciences (26%, 34), followed by the medical/health field (20.6%, 27). Humanities, engineering/aviation, and other accounted for about 22% in total. In studies of U.S.

universities, humanities and engineering scholars read far fewer journal articles on average than medical, science, and social science scholars.

Table 3. Respondents' Subject Disciplines

| Broad Subject Discipline | Frequency and Percent |
|------------------------------------|------------------------------|
| Medicine/Health | 27 (20.6) |
| Engineering/Aviation | 10 (07.6) |
| Social Science (Business & Law) | 40 (30.5) |
| Other Sciences | 34 (26.0) |
| Humanities | 17 (13.0) |
| Other | 3 (02.3) |
| Total | 131 (100) |

Not surprisingly, most respondents (69.6%, 103 of 148) came from the main campus at St. Lucia. Other locations included: Royal Brisbane Hospital (7.4%, 11), Ipswich (5.4%, 8), Princess Alexandra Hospital (4.7%, 7), Gatton (4.1%, 6), Mater Hospital (2%, 3), and others (6.8%, 10).

Degree, Age, Gender, and Rank.

Teaching/research assistants or fellows constituted the largest segment of respondents, accounting for 39.2% (56 of 143). Lecturers, including associate lecturers, lecturers, and senior lecturers, came next (31.5%). The remaining respondents consisted of professors (20.3%, 29). This number included associate professors and professors and others (9.1%, 13). Without UQ staff identification we are unable to access relevant reports on the UQ website to compare the location and rank of our respondents with the UQ population.

More than half of respondents hold a Ph.D. degree as their highest degree (61.9%, 91 of 147), greatly outnumbering those that reported holding either Bachelor- (15%, 22) or Master- (14.3%, 21) level degrees as their highest degree. Respondents reported attaining their highest degrees between 1964 and 2005, which can be clustered into three distinct ranges: 1964 to 1988, 1995 to 1999, and 2000 to 2003. (See Table 4.)

Table 4. Year Highest Degree Received

| Year | Frequency and Percent |
|------------------------------------|------------------------------|
| Over 15 years (1964~1988) | 37 (26.1) |
| 11 years ~ 15 years (1989~1994) | 18 (12.7) |
| 6 years ~ 10 years (1995~1999) | 37 (26.1) |
| 2 years ~ 5 years (2000~2003) | 36 (25.4) |
| 1st year (2004~2005) | 14 (9.9) |
| Total | 142 (100.2) |

The average age of 144 respondents to this question was 41 (with a standard deviation of 11.6). The three quartiles were respectively 31, 40, and 49. The youngest respondent was 20 years old, the oldest 71. Male respondents slightly outnumbered female respondents in the survey (51.7% or 75 of 145 versus 48.3% or 70 of 145).

Productivity as Measured by Authorship and Awards.

Some demographic questions pertain to authorship, which can be interpreted as one measure of productivity. We asked respondents to report how many publications they

authored in the last two years in refereed journals, non-refereed journals, book chapters or proceedings, entire books, or other publication types.

Across all publication types, with outliers excluded, the average number of publications per year by UQ academic staff respondents was 5.3 (with a standard deviation 4.6).

Among all the 151 respondents, 20.5% (31) report no publications in the last two years, while the maximum of publications reported was 59 (See Table 5.)

Table 5. Total Number of Publications in the Past 2 Years

| Publications | Frequency and Percent |
|---------------------|------------------------------|
| 0 | 31 (20.5) |
| 1 ~ 5 | 54 (35.8) |
| 6 ~ 10 | 41 (27.2) |
| 11 ~ 20 | 19 (12.6) |
| 21 ~ 30 | 3 (2.0) |
| > 30 | 3 (2.0) |
| Total | 151 (100) |

As can be seen in tables 6 and 7, within the totality of publications, articles in scholarly refereed journals were most common. Over half of the respondents (50.3% or 76 of 151) reported publication of one to five articles, although almost a third (30.5% or 46 of 151) reported no publications in refereed scholarly journals in the last 2 years. Respondents published an average of 3.7 articles in refereed scholarly journals in the last 2 years, with a standard deviation of 5.6. (A single respondent reported publication of 53 articles.) The average number of non-refereed articles was 1.6, with a standard deviation 3.6.

Respondents published an average 1.1 chapters with a standard deviation 2.0 in the past two years. A single respondent reported publication of 13 book chapters.

Table 6. Number of Publications in the Past 2 Years*

| | Refereed Articles | Non-Refereed Articles | Chapters or Proceedings | Other, non-book publications |
|--------------|--------------------------|------------------------------|--------------------------------|-------------------------------------|
| 0 | 46 (30.5) | 87 (57.6) | 93 (61.6) | 130 (86.7) |
| 1 ~ 5 | 76 (50.3) | 57 (37.8) | 50 (33.1) | 13 (8.7) |
| 6 ~ 10 | 19 (12.6) | 4 (2.6) | 7 (4.6) | 5 (3.3) |
| 11 ~ 20 | 8 (5.3) | 2 (1.3) | 1 (0.7) | 2 (1.3) |
| > 20 | 2 (1.3) | 1 (0.7) | 0 | 0 |
| Total | 151 (100) | 151 (100.0) | 151 (100.0) | 151 (100.0) |

*In all categories, a blank was interpreted as zero publications of that type.

We also asked “for the last refereed scholarly article that you published, how many co-authors did you have, if any?” The average number of reported co-authors for the last refereed scholarly article for 126 respondents was 2.3 (standard deviation of 2.9). The mode was 1 co-author and the median was 2. Just 19% of the last refereed articles published had no co-authors.

When asked how the research that produced their last scholarly article was funded, over one-third reported it was not specifically funded, but was done as a part of their role at the university (33.8%, 51 of 151). Government grants (30.5%, 46), industry grants or contracts (20.5%, 31), university-provided grants (also 20.5%), or other (8.6%, 13) funded the research for most refereed articles.

Publishing in refereed journal articles is the expectation for most subject disciplines in the sciences, social sciences, health, and engineering. Book publishing is expected mostly in humanities fields, with a single book over several years. With only 13% of our respondents from the humanities and a time frame of “within the last two years”, it is not surprising that the overwhelming majority (89.4%, 135 of 151 respondents) reported no book publications, 13 had 1 and only 3 had 2 books published in the last two years, with an overall mean of 0.13 across all respondents.

Another measure of productivity is whether respondents have received recognition for their work. We asked if they had received any awards or received any special recognition in the past two years. (We did not ask them to specify what types of awards or recognition, simply to answer yes or no.) Over three-quarters (77.9%, 109) reported receiving no awards or special recognition, but 22.1% respondents (31 of 140) had received awards or special recognition in the past two years. The reception of awards or special recognition was not dependent on position ($\chi^2 = 3.917, p = 0.271$), subject discipline ($\chi^2 = 4.427, p = 0.490$), UQ faculty ($\chi^2 = 7.445, p = 0.282$), degree ($\chi^2 = 4.597, p = 0.204$), gender ($\chi^2 = 0.937, p = 0.333$), or age ($\chi^2 = 0.847, p = 0.657$).

Personal Subscriptions.

One last demographic question asked how many personal subscriptions to professional journals are received by each respondent, including those paid by themselves, received free, or purchased by a grant or other source for personal or shared use. In addition, we asked how many of their total subscriptions are electronic.

Respondents reported an average of 3.2 personal subscriptions, with a standard deviation of 4.4, although almost a quarter (22.7% or 27 of 119) reported no personal subscriptions to professional journals and one person reported 40 subscriptions. The 25th, 50th, and 75th percentiles were respectively 1, 2, and 4.

Subscriptions held by respondents tended to be self-paid; only about a third of respondents (30.7%) had no self-paid subscriptions. Nearly two-thirds (60.7%) of the respondents reported holding one to five self-paid subscriptions. (See Table 7.)

Table 7. Subscriptions

| | Self-Paid | Free | Purchased by Grant or other for personal use | Purchased by Grant or other for shared use |
|--------------|------------------|-------------|---|---|
| 0 | 39 (30.7) | 92 (72.4) | 126 (99.2) | 123 (96.9) |
| 1~2 | 51 (40.2) | 20 (15.7) | 1 (0.8) | 3 (2.4) |
| 3~5 | 26 (20.5) | 10 (7.9) | 0 | 0 |
| 6~10 | 9 (7.1) | 4 (3.2) | 0 | 1 (0.8) |
| > 10 | 2 (1.6) | 1 (0.8) | 0 | 0 |
| Total | 127 (100) | (100) | (100) | (100) |

For the 98 respondents that reported holding subscriptions, the mean proportion of electronic subscriptions to the total personal subscriptions was 0.18 with a standard deviation of 0.35. Nearly three-quarters of respondents with subscriptions (73.5%, 72 of 98) reported holding no electronic subscriptions, while only about 15% of respondents reported that more than half of subscriptions were electronic. (See Table 8.)

Table 8. Proportion of Electronic Subscriptions to Total Personal Subscriptions

| Percent of Electronic of total Subscriptions | Frequency and Percent of Respondents |
|---|---|
| 0.00 | 72 (73.5) |
| 0.01~0.10 | 0 |
| 0.11~0.25 | 6 (6.1) |
| 0.26~0.50 | 4 (4.1) |
| 0.51~0.75 | 3 (3.1) |
| 0.76~1.00 | 13 (13.3) |
| Total | 98 (100.1) |

The total number of personal subscriptions was positively correlated with age (Pearson correlation coefficient = 0.329, $p < 0.0001$). As age increased, respondents tended to hold a greater number of subscriptions. The number of subscriptions also varied with position ($F = 7.816$, $p < 0.0001$).¹ Professors ($M = 6.00$, $SD = 7.65$) and lecturers ($M = 3.57$, $SD = 2.286$), did not differ from each other, but did differ significantly from teaching/research assistants or fellows. Professors and lecturers held more subscriptions than teaching/research assistants or fellows ($M = 1.51$, $SD = 1.69$, $p_{\text{professors} - \text{assistants}} = 0.029$, $p_{\text{lecturers} - \text{assistants}} < 0.0001$) and others ($M = 1.27$, $SD = 1.35$, $p_{\text{professors} - \text{assistants}} = 0.022$, $p_{\text{lecturers} - \text{assistants}} = 0.001$).

No significant evidence was found that the number of subscriptions varied with subject discipline ($F = 1.360$, $p = 0.245$), level of degree ($F = 1.326$, $p = 0.269$), or gender ($t = 0.972$, $p = 0.333$).

¹ Tamehane's T2 was used, since the test of homogeneity of variances indicated that significant variances existed between groups (levene statistic = 6.379, $p < 0.0001$).

Scholarly Journal Article Reading.

Total Amount of Reading per Academic Staff Member.

Although it relies on personal recollection, one of the key questions in all of our surveys from 1977 to the present is an estimate of the total number of articles read monthly by each respondent. We have asked this same question since 1977, so we can compare over time and across populations. To assist memory, we ask for a relatively short period of time and define articles and reading carefully. The first question asked is “*In the last 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.*” The relative amounts are more interesting than the exact number reported. For convenience, we often report results as readings in a year, simply by taking the monthly number reported by a respondent and multiplying it by 12, for a crude approximation of the total amount of reading by respondent per year.

The average amount of scholarly reading in the past four weeks at UQ was 16.4 articles (SD = 12.6) with outliers excluded, or 26.3 articles with all respondents. We can state with 95% confidence that the academic staff at UQ read on the average between 14.1 and 19.1 articles in the last 4 weeks. Extrapolated to a year, the average number of articles read by UQ academic staff across all disciplines was 197 (with outliers excluded)

or 316 with all respondents. The figure of 197 is consistent with the amount of reading by academic staff. UNSW read on the average between 13.7 and 16.5 articles in the last 4 weeks, or extrapolating up to the year, from between 165 and 198 articles per year (95% confidence level).

The UQ amount of reading on average per year compares to 206 articles across all faculties in three U.S. universities that were surveyed between 2000 and 2003. University of Tennessee in 2000 averaged 186, Drexel University in 2002 averaged 197, and University of Pittsburgh in 2003 averaged 215. The report comparing the U.S. universities concluded: “While there is some difference in average amount of reading among the three universities ... Nevertheless, reading by faculty is substantial and, perhaps, increasing as shown in the section on 25-year trends in university scientists' use patterns.” (See King, Tenopir, Montgomery, and Aerni.). Reading amounts could also be normalized by relative size of Faculties.

Among the total 146 respondents, the largest group reported reading one to 10 articles in the last four weeks, accounting for 37% (54 persons). Respondents who had read more than 30 articles accounted for less than 20% in total. Only 4 persons had read nothing, while one respondent reported reading 400 articles. (See Table 9.)

Table 9. Amount of Reading in the Previous Month by UQ Staff

| Number of Articles (Range) | Frequency and Percent |
|-----------------------------------|------------------------------|
| 0 | 4 (2.8) |
| 1~10 | 54 (37.0) |
| 11~20 | 44 (30.3) |
| 21~30 | 17 (11.7) |
| 31~40 | 12 (8.3) |
| 41~50 | 3 (2.1) |

| | |
|--------------|-----------|
| 51~80 | 2 (1.4) |
| 81~400 | 10 (6.9) |
| Total | 146 (100) |

Last Incident of Reading and Novelty of Information in the Reading.

After the question that asks for recollection of amount of reading, we ask respondents to focus on the last scholarly article they read. This is a variation on the “critical incident” technique, where the last article reading is assumed to be random in time, and gives us detailed information on a random sample of total readings by the UNSW academic staff. Again we try to give quite explicit instructions, by asking: **“The following questions in this section refer to the SCHOLARLY ARTICLE YOU READ MOST RECENTLY, even if you had read the article previously. Note that this last reading may not be typical, but will help us establish the range of patterns in reading.”** To better focus their minds on this last article reading, we then ask for the title of the journal from which this last article was read or, if not from a journal, the topic of the article. This question is merely to focus their minds on the reading; we do not use it in our analysis.

Since this reading could be a first-time reading or a re-reading and because reading patterns differ for core journals in a discipline (those from which scholars read many articles each year), we ask if this is a re-reading and, “if this article is from a journal,” “approximately how many articles did you read from this journal in the **last 12 months?**” A journal from which a reader reads more than 10 articles per year could be considered a core journal for that reader or that reader’s subject discipline. We might examine differences in value, form, time spent, purpose, and method of locating articles for core journal readings vs. non-core.

Although they tend to read many articles from the same journals, the specific article was new to most readers; the majority of respondents (78.5%, 113) had not previously read the most recent article. Such previous experiences had no impact on the time spent in reading the article ($t = -0.033, p = 0.974$). The average reading time for respondents who had previously read the article was 32.6 minutes, nearly the same as those who had not (32.9 minutes).

A greater number of respondents reported prior knowledge of article content prior to their first reading (54.5%, 79 of 145) than those who did not. This prior knowledge had no significant impact on reading time ($t = 0.179, p = 0.858$), although respondents who knew about the information in the article reported spending a little more time on the average (33.2 minutes) than those who did not (32 minutes).

For those who knew about the information prior to this reading we asked how they found out about the information the first time. Most respondents reported they first found out about the information via journal articles or through informal discussions with colleagues than through any other single method (32.9% and 28.9% respectively).

Most of the remaining found the information the first time at a conference/workshop, via email from a colleague, and a listserv or news group, or on the Web site of author. (See Table 10.)

Table 10. How Staff First Found Out About Information in Last Reading

| Source of Information | Frequency and Percent |
|---|------------------------------|
| Journal article | 25 (32.9) |
| Information discussions with colleagues | 22 (28.9) |
| Conference/ workshop | 8 (10.5) |
| Email from colleague | 6 (7.9) |
| Listserv or news group | 2 (2.6) |
| Web site of author | 1 (1.3) |
| Other | 12 (15.8) |
| Total | 76 (100) |

Date of Readings.

The year of the last article read ranged from 1929 to 2005. Over half of the readings (54.8%, 80 of 146) were articles from the current 17 months (2004-May 2005.) If we assume that 23 readings is equal to 5 months worth of reading (29% of 80 readings) and subtract that from the 17 month time period total, we can approximate that 57 readings or 80-23) or 39% of readings were within the first year of publication. More than a quarter (27.4%) of all readings were from articles two to five years old. The remaining readings, which accounted for less than 20% in total, were from articles published or posted prior to 1995. (See Table 11.)

Table 11. Year of Articles Read by Date Groupings

| Year Span | Frequency and Percentage |
|---------------------------------|---------------------------------|
| Over 15 years (1929~1988) | 6 (4.1) |
| 11 years ~ 15 years (1989~1994) | 6 (4.1) |
| 6 years ~ 10 years (1995~1999) | 14 (9.6) |
| 2 years ~ 5 years (2000~2003) | 40 (27.4) |
| 1st 17 months (2004~2005) | 80 (54.8) |
| Total | 146 (100) |
| Most recent 12 months | 57 (39.0) |

In previous U.S. university surveys and surveys of astronomers, we consistently have found about only one-third of readings are from articles older than the current year (Tenopir, King, Boyce, Grayson, and Paulson). This falls to just 19% for pediatricians in clinical settings (Tenopir, King, Clarke, Na, and Zhou). Why do UQ (and UNSW) academic staff members appear to read a higher percentage of older articles? It is possible, although unlikely, that the difference is explained by regional differences, as most respondents to our other surveys were from North America. It could be that the growing availability of electronic journal backfiles, older articles on the web, backfiles of indexes and abstracts, and embedded links to older articles have influenced reading patterns. Except for the survey of Pediatricians in July-August 2004, our other most recent surveys in the U.S. were conducted from 2000-2003. We will test this hypothesis later this year, when we survey several U.S. universities. If the U.S. universities surveyed in 2005 now have backfile collections comparable to UQ and UNSW, their academic staff should be expected to report an increased amount of reading of older articles. We will also examine our method of calculated current year carefully, to make sure that it is consistent.

Time Spent Reading.

Respondents report spending an average of 25.3 minutes (minus outliers) reading the most recent article, with a standard deviation of 14.9. The three quartiles were respectively 15, 20 and 30. About 72% of total respondents (103 of 143) spent one to 30 minutes in reading. Those who spent 11 to 20 minutes comprised the largest portion of

this group at 31.5%, (45 of 103). (See Table 12.) We have 95% confidence to say that the staff at UQ spent between 22.7 and 27.8 minutes on average per article reading.

Table 12. Time Spent in Last Reading

| Time Range (minutes) | Frequency and Percent |
|---------------------------------|----------------------------------|
| 1 ~10 | 27 (18.9) |
| 11 ~ 20 | 45 (31.5) |
| 21 ~ 30 | 31 (21.7) |
| 31 ~ 40 | 10 (7.0) |
| 41 ~ 50 | 11 (7.7) |
| 51 ~ 60 | 11 (7.7) |
| 61 ~ 80 | 2 (1.4) |
| 81 ~ 100 | 2 (1.4) |
| 101 ~ 300 | 3 (2.1) |
| > 300 | 1 (0.7) |
| Total | 143 (100.1) |

Source and Location of Reading.

We also asked “how did you initially find out about this last article you read?” Sixteen different choices (plus other), reflect today’s complex information environment, where readers have many ways of finding articles available to them. Two-thirds of respondents reported browsing to initially find out about the last article (33.1%, 47 of 142), while almost a quarter found out about the article by searching (23.2%, 33). This is similar to the patterns reported by the academic staff at UNSW and at Drexel University in the United States. (See King, Tenopir, Montgomery, and Aerni).

Browsing a library electronic subscription was the most common way for the browsing group to find out about articles (14.8%, 21), whereas searching an indexing/abstracting database (17.6%, 25) was the most used method among the searching group. Surprisingly

very few respondents indicated they found the article by searching a web search engine. (See Table 13). Colleagues remain an important source of articles (20.4%). The way in which respondents initially find out about the article last read had no relationship to reading time ($F = 1.5536, p = 0.2154$).

Table 13. How Staff Initially Found Out About Articles

| | | Frequency and Percent |
|------------------|--|------------------------------|
| Browsing | Browsing a personal print subscription. | 11 (7.7) |
| | Browsing a personal electronic subscription. | 3 (2.1) |
| | Browsing a library print subscription. | 8 (5.6) |
| | Browsing a library electronic subscription. | 21 (14.8) |
| | Browsing other electronic collection. | 4 (2.8) |
| Subtotal | | 47 (33.1) |
| Searching | Searching an indexing/abstracting database. | 25 (17.6) |
| | Searching a Web search engine. | 3 (2.1) |
| | Searching online journal collections. | 5 (3.5) |
| Subtotal | | 33 (23.2) |
| Other | Sent to me as a part of an alerting service. | 9 (6.3) |
| | Received from a listserv or news group. | 2 (1.4) |
| | Cited in another publication. | 11 (7.7) |
| | Another person (e.g., a colleague) told me about it. | 29 (20.4) |
| | Don't know or other. | 11 (7.7) |
| Subtotal | | 62 (43.7) |
| Total | | 142 (100) |

Although it is difficult to tell whether articles found from a colleague or cited in another publication are print or electronic, at least one-half of total readings by UQ academic staff came from electronic sources, including browsing, searching, alerts, and electronic lists. But just because electronic sources are the most popular for locating relevant

articles, it does not mean that the computer screen is the final form for reading. An overwhelming number of respondents reported their last reading was in print form, accounting for 81.2% (117 of 144). Respondents reading in electronic form only accounted for 18.8% (27). (See Table 14.)

Although one might assume that reading form would impact the speed of reading, no significant differences in the time spent in last reading were found between print and electronic readers ($t = 0.8180, p = 0.415$).

Table 14. Reading Form

| Form of Reading | | Frequency and Percent |
|------------------------|--|------------------------------|
| Print | Print copy (e.g., offset print like in a journal) | 31 (21.5) |
| | Photocopy | 18 (12.5) |
| | Facsimile copy | 1 (0.7) |
| | Downloaded and printed (e.g., printed PDF) | 67 (46.5) |
| Subtotal | | 117 (81.2) |
| Electronic | Online computer screen (e.g., HTML version) | 15 (10.4) |
| | Previously downloaded/saved and read, on computer screen | 12 (8.3) |
| Subtotal | | 27 (18.8) |
| Other | | 0 |
| Total | | 144 (100) |

A majority of respondents reported reading either in office/lab or at home, accounting for 59.7% (86 of 144) and 31.3% (45) respectively. The other locations (while traveling, in the university library, other) accounted for just 9% in total. It may come as no surprise to librarians that academic staff read few articles in the physical library. Respondents who read while at university library accounted for only 2.8% (4).

Purpose and Value of Reading.

Unlike usage log data, survey data provides a picture of purpose, value, and outcomes from reading. We asked respondents to describe both one principal purpose and as many secondary purposes for which “you have used, or do you plan to use, the information obtained from the article you last read?”

Most respondents reported reading primarily for research (63.7%, 93 of 146), with readings for teaching as principal purpose accounting for 12.3% (18). Among the three groups (research, teaching, and other), no significant differences were found in the amount of reading in the past four weeks ($F = 0.538, p = 0.585$) and the time spent in last reading ($F = 2.102, p = 0.126$). Principal purpose was not associated with the way to initially find out about articles ($\chi^2 = 3.382, p = 0.496$) and reading form ($\chi^2 = 0.806, p = 0.668$).

Table 15. Reading Purpose

| Principal Purpose | | Frequency and Percent |
|--------------------------|--|------------------------------|
| Research | | 93 (63.7) |
| Teaching | | 18 (12.3) |
| Other | Current awareness/ Keep up with the literature | 11 (7.5) |
| | Writing proposals, reports, articles, etc. | 12 (8.2) |
| | Consulting, advising others | 2 (1.4) |
| | Presentations | 2 (1.4) |
| | Other | 8 (5.5) |
| Subtotal | | 35 (24) |
| Total | | 146 (100) |

The most commonly reported way in which reading affected principal purpose was the inspiration of new thinking or ideas (45% or 68 of 151). The second most commonly reported way was to improve the results (38.4%, 58). Reading also helped respondents to narrow or broaden or change the focus (24.5%, 37), and to resolve technical problems in a somewhat important way (14.6%, 22).

Respondents also reported the last reading played a role in saving time or other resources, resulted in faster completion and collaboration or joint research. Only 2.6% (4 respondents) felt the reading was not helpful or it wasted their time. (See Table 16.)

Table 16. The Way That Reading Effects Principal Purpose

| Effect on Principal Purpose | Responses | |
|---|-----------|------------|
| | Frequency | Percentage |
| It improved the results. | 58 | 38.4 |
| It narrowed/ broadened/ changed the focus. | 37 | 24.5 |
| It inspired new thinking/ideas. | 68 | 45.0 |
| It resulted in collaboration/ joint research. | 5 | 3.3 |
| It resulted in faster completion. | 11 | 7.3 |
| It resolved technical problems. | 22 | 14.6 |
| It saved time or other resources. | 14 | 9.3 |
| It wasn't helpful; it wasted my time. | 4 | 2.6 |
| Other | 8 | 5.3 |

N = 151

On a scale of 1 to 3, with 1 being not at all important, 2 being somewhat important, and 3 being absolutely essential, respondents felt the information contained in the last reading was on average more than somewhat important (mean = 2.26, SD = 0.49) to achieving their principal purpose. Most respondents reported the information as being somewhat

important (69.7% or 101 of 145). 28.3% (41) reported they felt that the information was absolutely essential. Only 2.1% (3) reported that the information was of no import whatsoever.

Differences of Reading Patterns by Demographic Factors

Differences in Reading Patterns by Subject Discipline and Faculty.

Although we have observed it in other studies, at UQ no significant differences in the amount of reading ($F = 1.924, p = 0.095$) and the time spent in last reading ($F = 1.738, p = 0.131$) were found among subject discipline groups. The way to find articles ($\chi^2 = 10.888, p = 0.366$), reading form ($\chi^2 = 5.880, p = 0.318$) and principal purpose of reading ($\chi^2 = 13.991, p = 0.1734$) did not vary with subject discipline.

Because the group size of “other” faculties or institutions was extremely small, we excluded this group when Chi-square tests were performed. Although reading form did not vary with faculty ($\chi^2 = 3.489, p = 0.625$), the way of finding out articles was significantly associated ($\chi^2 = 21.164, p = 0.020$)². Compared to other groups, arts respondents tended to be more likely to use browsing and less likely to use searching to find out about articles. While respondents from health sciences were more likely to use searching and less likely to use other ways to find out articles, those from engineering, physical sciences & architecture suggested a reverse pattern. (See Table 17.)

² 20% of cells have expected count less than 5, Chi-square suspect. Instead of Pearson Chi-square statistics, Likelihood ratio was used.

Table 17. Association between Faculty and Way of Finding out Articles

| Count Row % Cell Chi ² | | How to find out articles | | | Row Total |
|---|--|-----------------------------|------------------------------|------------------------------|--------------|
| | | Browsing | Searching | Other | |
| Faculty | Arts | 8 61.54 3.1877 | 0 0.00 2.9355 | 5 38.46 0.1018 | 13 |
| | BACS & Natural Resources | 4 21.05 0.8291 | 6 31.58 0.6813 | 9 47.37 0.0389 | 19 |
| | Business, Economics & Law | 3 20.00 0.7743 | 5 33.33 0.7680 | 7 46.67 0.0181 | 15 |
| | Engineering, Physical Sciences & Architecture | 7 25.93 0.4161 | 3 11.11 1.5730 | 17 62.96 2.1078 | 27 |
| | Health Sciences | 11 39.29 0.3278 | 10 35.71 2.1389 | 7 25.00 2.3648 | 28 |
| | Social & Behavioural Sciences | 8 36.36 0.0724 | 4 18.18 0.1885 | 10 45.45 0.0060 | 22 |
| Column Total | | 41 | 28 | 55 | 124 |

Principal purpose was also significantly associated with faculty ($\chi^2 = 19.549, p = 0.034$).³

Unlike the other groups, no respondents from Arts or Social & Behavioural Sciences reported reading for teaching purposes. Respondents from health sciences were less likely to read for research than other groups (43.33%, versus a range of 71.43% to 84.62% for other groups) and more likely to read for other purposes (36.67%, versus a range of 6.67% to 21.43% for other groups). This is consistent with our recent survey of medical faculty at the University of Tennessee and Pediatricians who are members of the American Academy of Pediatrics. Physicians, both in university and non-university

³ 20% of cells have expected count less than 5, Chi-square suspect. Instead of Pearson Chi-square statistics, Likelihood ratio was used.

settings, tend to read most often for current awareness. (Tenopir, et al, 2004 and Tenopir, et al, 2006).

In contrast, respondents from Business, Economics and Law (6.67%), BACS and Natural Resources (10.53%) were less likely to read for other purposes. (See Table 18.)

Table 18. Association between Faculty and Principal Purpose

| Count Row % Cell Chi ² | | Principal Purpose | | | Row Total |
|---|--|------------------------------|----------------------------|------------------------------|--------------|
| | | Research | Teaching | Other | |
| Faculty | Arts | 11 84.62 0.8849 | 0 0.00 1.7402 | 2 15.38 0.3160 | 13 |
| | BACS & Natural Resources | 15 78.95 0.6854 | 2 10.53 0.1161 | 2 10.53 1.2605 | 19 |
| | Business, Economics & Law | 12 80.00 0.6188 | 2 13.33 0.0000 | 1 6.67 1.7172 | 15 |
| | Engineering, Physical Sciences & Architecture | 20 71.43 0.2569 | 2 7.14 0.8153 | 6 21.43 0.0242 | 28 |
| | Health Sciences | 13 43.33 1.9664 | 6 20.00 0.9805 | 11 36.67 2.5136 | 30 |
| | Social & Behavioural Sciences | 11 84.62 0.8849 | 0 0.00 1.7402 | 2 15.38 0.3160 | 13 |
| Column Total | | 81 | 17 | 29 | 127 |

Differences in Reading Patterns by Rank, Highest Degree, Age, and Gender.

No significant difference in the amount of reading ($F = 1.586, p = 0.196$) or the time spent in last reading ($F = 1.937, p = 0.127$) was found between academic rank groups.

Although rank was not associated with the way of finding out articles ($\chi^2 = 2.638, p =$

0.853) or reading form ($\chi^2 = 0.624, p = 0.891$), different academic rank groups did have different principal purposes of reading ($\chi^2 = 26.058, p = 0.0002$).⁴ This was reflected in the difference between the lecturers and teaching/research assistants or fellows of reading for teaching purposes, which contributed most to the entire Chi-square statistics. The teaching percentage of lecturer respondents was relatively larger than the other groups. No assistants or fellows reported reading for teaching purposes,

Table 18. Association between Position and Principal Purpose

| Count Row % Cell Chi ² | Research | Teaching | Other | Row Total |
|---|-----------------------|------------------------------|-----------------------|--------------|
| Professor | 17 58.62 0.0668 | 4 13.79 0.0240 | 8 27.59 0.0892 | 29 |
| Lecturer | 24 54.55 0.4362 | 13 29.55 9.7041 | 7 15.91 1.4083 | 44 |
| Teaching/Research Assistant or Fellow | 37 67.27 0.2083 | 0 0.00 7.0213 | 18 32.73 1.3844 | 55 |
| Other | 10 76.92 0.4387 | 1 7.69 0.2621 | 2 15.38 0.4665 | 13 |
| Column Total | 88 | 18 | 35 | 141 |

According to the ANOVA and the Chi-square tests, degree played no role in the amount of reading ($F = 1.057, p = 0.370$), reading time ($F = 0.657, p = 0.580$), principal purpose ($\chi^2 = 7.788, p = 0.254$), the way of finding out about articles ($\chi^2 = 3.921, p = 0.687$), or reading form ($\chi^2 = 2.120, p = 0.548$).

Age was not correlated with the time spent in last reading (Pearson correlation coefficient = 0.010, $p = 0.456$, 1-tailed), but was significantly negatively correlated with the amount

⁴ 20% of cells have expected count less than 5, Chi-square suspect. Instead of Pearson Chi-square statistics, Likelihood ratio was used.

of reading, although the negative correlation was not strong (Pearson correlation coefficient = -0.190, $p = 0.012$, 1-tailed).

Although we found that no respondents 30 years of age or younger read primarily for teaching ($\chi^2 = 9.856$, $p = 0.043$, see Table 19), no significant evidence was found to show that age was associated with reading form ($\chi^2 = 2.344$, $p = 0.310$) or the method by which respondents found out about articles ($\chi^2 = 4.175$, $p = 0.383$).⁵

Table 19. Association between Age and Principal Purpose

| Count Row % Cell Chi^2 | | Research | Teaching | Other | Row Total |
|------------------------------|---------|-----------------------|----------------------------|-----------------------|--------------|
| Age | = < 30 | 23 71.88 0.3031 | 0 0.00 3.8310 | 9 28.13 0.2337 | 32 |
| | 31 ~ 40 | 27 65.85 0.0200 | 6 14.63 0.2427 | 8 19.51 0.3363 | 41 |
| | > 40 | 41 59.42 0.2342 | 11 15.94 0.9085 | 17 24.64 0.0139 | 69 |
| Column Total | | 91 | 17 | 34 | 142 |

No significant differences were found between male and female respondents in the amount of reading ($t = -0.351$, $p = 0.726$), the time spent in last reading ($t = 0.896$, $p = 0.372$), the way of finding out articles ($\chi^2 = 1.161$, $p = 0.560$), or reading form ($\chi^2 = 0.001$, $p = 0.980$).

⁵ To perform Chi-square tests to see if age was associated with such categorical variables as reading form, the way to find out articles, and principal purpose of reading, we regrouped age as an ordinal variable with such three levels as 1 (= < 30), 2 (31 ~ 40), and 3 (> 40). Thus, $df = 2$. The Chi-square tests involving age below were the same.

Principal purpose of reading was associated with gender ($\chi^2 = 6.606, p = 0.0368$). A greater percentage of male respondents (72.97%) reported reading for research than their female counterparts (53.62%), whereas the percentage of reading for teaching reported by male respondents (6.76%) was significantly smaller than that reported by female respondents (17.38%). (See Table 20.)

Table 20. Association between Gender and Principal Purpose

| Count Row % Cell Chi ² | Research | Teaching | Other | Row Total |
|---|------------------------------|------------------------------|-----------------------|--------------|
| Male | 54 72.97 1.0137 | 5 6.76 1.6390 | 15 20.27 0.5347 | 74 |
| Female | 37 53.62 1.0871 | 12 17.39 1.7578 | 20 28.99 0.5734 | 69 |
| Column Total | 91 | 17 | 35 | 143 |

Not surprisingly since these results seem to indicate that the male respondents are reading more for research, the average publication rate of male respondents was more than twice that of female respondents (8.73 versus 4.31) ($t = 3.433, p < 0.0001$).

Although the amount of publications did not vary with subject discipline ($F = 1.348, p = 0.248$) and faculty ($F = 0.872, p = 0.518$), position did play a role ($F = 15.053, p < 0.0001$). Tamehane's T2⁶ showed that professors ($M = 14.69, SD = 13.79$) published significantly more than all the other groups, lecturers ($M = 5.37, SD = 3.94, p = 0.008$), teaching/research assistants or fellows ($M = 5.05, SD = 4.66, p = 0.006$), and others ($M =$

⁶ The test of homogeneity of variances indicated that significant variances existed between groups (levene statistic = 12.452, $p < 0.0001$). Thus, Tamehane's T2 was used.

1.92, $SD = 3.04$, $p < 0.0001$). The differences between lecturers and others ($p = 0.015$), and between teaching/research assistant or fellows and others were also significant ($p = 0.035$).

Whether or not respondents held a Ph.D. also played a role in number of publications in the last two years ($F = 10.639$, $p < 0.0001$).⁷ Respondents with a Ph.D. published 9.42 items on the average in the last 2 years with a standard deviation of 9.21, much more than those holding a Bachelor- ($M = 1.82$, $SD = 2.48$, $p < 0.0001$), or Master- ($M = 2.86$, $SD = 3.00$, $p < 0.0001$) level degree as well as other respondents ($M = 2.08$, $SD = 2.25$, $p < 0.0001$).

Unlike all of our previous studies, the number of publications in the last two years was not correlated with the amount of reading (Pearson correlation coefficient = 0.019, $p = 0.822$). Number of publications also was not correlated with the number of subscriptions (Pearson correlation coefficient = 0.129, $p = 0.151$) and did not vary with principal purpose ($F = 0.539$, $p = 0.585$). However, it was positively correlated with age (Pearson correlation coefficient = 0.206, $p = 0.0065$, 1-tailed). Older respondents published slightly more than their younger counterparts.

However, respondents who had received awards or other special recognition in the last two years differed significantly in the amount of reading over the past four weeks from those who had not. The average amount of reading for award recipients was 36.2 articles,

⁷ Tamehane's T2 was used, since the test of homogeneity of variances indicated that significant variances existed between groups (Levene statistic = 3.85, $p = 0.011$).

significantly more than the average of non-recipients:20.0 ($t = 2.361$, $p = 0.020$). This is consistent with the results of all other studies we have conducted over the last three decades, (with the exception of the UNSW staff survey, where uncharacteristically no significant difference in amount of reading was found between those who has won awards in the last two years and those who had not.)

Role of Library Collections

University of Queensland staff located articles by many methods, as documented in Table 5 (How Staff Initially Found Out About Articles). This table delineates three broad methods by which respondents located articles: browsing, searching and use of other methods.

The broad finding method categories were compared to type of resource used to locate articles (See Table 21). Library resources (library subscriptions-print and electronic, use of an indexing, abstract database, received from an alerting service) played a vital role in location of articles, carrying the highest percentages in both the 'browsing' and 'searching' categories. Overall, 43.4% of total readings (63 of 145) came from library resources, including library print and electronic subscriptions, indexing/ abstracting databases and alert services. 46.9 % (68 of 145) of total respondents reported that articles were found via some 'other' method including receiving the article from a listserv or news group, finding the articles via a citation in another publication, and word of mouth. Only 9.7% (14 of 145) of total respondents attributed articles found as coming from personal resources. Notably, all 'personal' resource use responses fell into the 'browsing' method.

Table 21. Association between Resource Location Type and Method of Finding Out About Articles

| | | Count Row % Total % | Resource Location Type | | | Row Total |
|---|------------------|---------------------------|------------------------|----------|-------|--------------|
| | | | Library | Personal | Other | |
| How did you initially find out about this last article you read? | Browsing | Count | 29 | 14 | 4 | 47 |
| | | Row % | 61.7 | 29.8 | 8.5 | 100 |
| | | % of Total | 20 | 9.7 | 2.8 | 32.4 |
| | Searching | Count | 25 | 0 | 9 | 34 |
| | | Row % | 73.5 | 0 | 26.5 | 100 |
| | | % of Total | 17.2 | 0 | 6.2 | 23.4 |
| | Other | Count | 9 | 0 | 55 | 64 |
| | | Row % | 14.1 | 0 | 85.9 | 100 |
| | | % of Total | 6.2 | 0 | 37.9 | 44.1 |
| Total | | Count | 63 | 14 | 68 | 145 |
| | | % of Total | 43.4 | 9.7 | 46.9 | 100 |

Across the board, respondents read more for research than for any than other purpose, carrying the highest percentages within each resource type (67.2% for library and 'Other' resources and 42.9% for personal resources). Teaching was the secondly most commonly reported purpose at 12.0% of total cases. Personal resources carried the greatest likelihood of being used for this purpose at a reported 35.7%. With the exception of the 11.5 % reported for teaching and 'other' purposes in the 'other' resource location type, percentages for all other categories remained below double digits. (See Table 22)

Table 22 Association of Resource Location Type and Purpose

| Count Row % Total % | | Purpose | | | | | Row Total | |
|---------------------------------------|-----------------|----------|----------|--|--|---------------------------------------|--------------|--------|
| | | Research | Teaching | Current awareness/ keeping up | Writing proposals, reports, articles, etc. | Other (please specify below) | | |
| Resource Location Type | Library | Count | 45 | 5 | 6 | 6 | 5 | 67 |
| | | Row% | 67.2% | 7.5% | 9.0% | 9.0% | 7.5% | 100.0% |
| | Personal | Count | 6 | 5 | 1 | 1 | 1 | 14 |
| | | Row% | 42.9% | 35.7% | 7.1% | 7.1% | 7.1% | 100.0% |
| | Other | Count | 41 | 7 | 3 | 3 | 7 | 61 |
| | | Row% | 67.2% | 11.5% | 4.9% | 4.9% | 11.5% | 100.0% |
| Total | Count | 92 | 17 | 10 | 10 | 13 | 142 | |
| | Row% | 64.8% | 12.0% | 7.0% | 7.0% | 9.2% | 100.0% | |

The average number of articles read over the last four weeks varied according to resource location type.

(See Table 23)

Table 23 Mean of Number of Articles Read by Resource Location Type

| | N | Mean | Std. Error | 95% Confidence Interval for Mean | |
|-----------------|-----|-------|---------------|-------------------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Library | 67 | 30.16 | 4.794 | 20.59 | 39.74 |
| Personal | 14 | 32.86 | 14.411 | 1.72 | 63.99 |
| Other | 60 | 21.32 | 6.631 | 8.05 | 34.58 |
| Total | 141 | 26.67 | 3.886 | 18.98 | 34.35 |

Perhaps not surprisingly, respondents most commonly reported reading more articles published during the current year of the survey (80 of 143). This was followed by those that reported reading articles published from 2000-2003 (40 of 143). Articles from other time periods made up just over 16% of reported readings (23 of 143).

This pattern is reflected within each resource location type as well. 'Other' resources were the most commonly reported resource location type (46.9%), followed by library resources (43.4%). Personal resources played only a marginal role (10%). (See Table 24).

Table 24. Association between Resource Location Type and Age Range of Article

| | Count Row % Total % | Year Range | | | | | 1989 or older | Row Total |
|---------------------------------------|---------------------------|---------------|---------------|---------------|---------------|-----|---------------------|--------------|
| | | 2004- 2005 | 2000- 2003 | 1995- 1999 | 1990- 1994 | | | |
| Resource Location Type | Library | Count | 39 | 13 | 6 | 1 | 3 | 62 |
| | | Row % | 62.9 | 21 | 9.7 | 1.6 | 4.8 | 100 |
| | | % of Total | 27.3 | 9.1 | 4.2 | 0.7 | 2.1 | 43.4 |
| | Personal | Count | 8 | 5 | 1 | 0 | 0 | 14 |
| | | Row % | 57.1 | 35.7 | 7.1 | 0 | 0 | 100 |
| | | % of Total | 5.6 | 3.5 | 0.7 | 0 | 0 | 9.8 |
| | Other | Count | 33 | 22 | 5 | 4 | 3 | 67 |
| | | Row % | 49.2 | 32.9 | 7.5 | 6 | 4.5 | 100 |
| | | % of Total | 23.1 | 15.4 | 3.5 | 2.8 | 2.1 | 46.9 |
| Total | Count | 80 | 40 | 12 | 5 | 6 | 143 | |
| | % of Total | 55.9 | 28.0 | 8.4 | 3.5 | 4.2 | 100 | |

Table 25 documents the variation of resource location type according to UQ Faculty affiliation. Total percentages reported for library related resources and 'other' resources were close, while reported use of personal resources lags far behind. This is not surprising, given the small overall percentage of personal resource use previously reported.

Two Faculties (Arts and NRAVS) demonstrated equal likelihood of using library or 'other' resources, while remaining Faculties showed a definite preference for one or the other. Of these remaining Faculties two are notable: EPSA Faculty demonstrated a very

high (72%) likelihood of using 'other' resources while the BACS Faculty reported an estimated 87.5% of using library-related resources.

Table 25. Association of Resource Location Type and UQ Faculty

| | | Resource Location Type | | | Row Total | |
|----------------------------|--|------------------------|----------|-------|-----------|------|
| | | Library | Personal | Other | | |
| UQ FACULTY | Arts | Count | 5 | 1 | 5 | 11 |
| | | Row % | 45.5 | 9.1 | 45.5 | 100 |
| | | % of Total | 3.5 | 0.7 | 3.5 | 7.6 |
| | Biological/Chemical Sciences (BCS) | Count | 7 | 0 | 1 | 8 |
| | | Row % | 87.5 | 0 | 12.5 | 100 |
| | | % of Total | 4.9 | 0 | 0.7 | 5.6 |
| | Business, Economics & Law (BEL) | Count | 6 | 0 | 8 | 14 |
| | | Row % | 42.9 | 0 | 57.1 | 100 |
| | | % of Total | 4.2 | 0 | 5.6 | 9.7 |
| | Engineering, Physical Sciences & Architecture (EPSA) | Count | 4 | 3 | 18 | 25 |
| | | Row % | 16 | 12 | 72 | 100 |
| | | % of Total | 2.8 | 2.1 | 12.5 | 17.4 |
| | Health Sciences | Count | 17 | 4 | 9 | 30 |
| | | Row % | 56.7 | 13.3 | 30 | 100 |
| | | % of Total | 11.8 | 2.8 | 6.25 | 20.8 |
| | Natural Resources, Agriculture & Veterinary Science (NRAVS) | Count | 5 | 2 | 5 | 12 |
| | | Row % | 41.7 | 16.7 | 41.7 | 100 |
| | Social & Behavioural Sciences (SBS) | % of Total | 3.5 | 1.4 | 3.5 | 8.3 |
| | | Count | 8 | 2 | 13 | 23 |
| | | Row % | 34.8 | 8.7 | 56.5 | 100 |
| Other/Not Specified | % of Total | 5.6 | 1.4 | 9 | 16 | |
| | Count | 11 | 2 | 8 | 21 | |
| | Row % | 52.4 | 9.5 | 38.1 | 100 | |
| Total | % of Total | 7.6 | 1.4 | 5.6 | 14.6 | |
| | Count | 63 | 14 | 67 | 144 | |
| | % of Total | 43.8 | 9.7 | 46.5 | 100 | |

Differences were also evident across subject disciplines (see Table 26). Respondents from medical/health disciplines and humanities were most likely to utilize library resources, reporting at 66.7% and 52.9% respectively. Respondents from medical/health disciplines were also most likely to use personal resources. This is consistent with our

previous surveys that show that medical readers rely on personal and other sources for current awareness and library resources for research and teaching. Those respondents classified among 'other' disciplines displayed the highest likelihood of using 'other' resource types (66.7%), followed by engineering/aviation (57.1%) and social science (51.4%).

Table 26. Association of Subject Discipline and Resource Location Type

| | | Resource Location Type | | | Row Total | |
|---------------------------|--|-------------------------------|----------|-------|------------------|------|
| | | Library | Personal | Other | | |
| Subject Discipline | Med/Health | Count | 16 | 4 | 6 | 26 |
| | | Row % | 61.5 | 15.4 | 23.1 | 100 |
| | | % of Total | 12.6 | 3.1 | 4.7 | 20.5 |
| | Engineering/Aviation | Count | 3 | 2 | 8 | 13 |
| | | Row % | 23.1 | 15.4 | 61.5 | 100 |
| | | % of Total | 2.4 | 1.6 | 6.3 | 10.2 |
| | Social Science (Business & Law) | Count | 13 | 2 | 22 | 37 |
| | | Row % | 35.1 | 5.4 | 59.5 | 100 |
| | | % of Total | 10.2 | 1.8 | 17.3 | 29.1 |
| | Other Sciences | Count | 14 | 3 | 17 | 34 |
| | | Row % | 41.2 | 8.9 | 50 | 100 |
| | | % of Total | 11 | 2.4 | 13.4 | 26.8 |
| | Humanities | Count | 7 | 1 | 5 | 13 |
| | | Row % | 53.8 | 7.7 | 38.5 | 100 |
| | | % of Total | 5.5 | 0.8 | 3.9 | 10.2 |
| | Other | Count | 1 | 0 | 3 | 4 |
| | | Row % | 25 | 0 | 75 | 100 |
| | | % of Total | 0.8 | 0 | 2.4 | 3.1 |
| Total | Count | 54 | 12 | 61 | 127 | |
| | % of Total | 42.5 | 9.4 | 48 | 100 | |

The ANOVA indicates that respondents using personal resources tended to be the oldest of the three resource type categories, reporting a mean age of 42.9, followed closely by those using "other" resources at a mean age of 41.5 and library resources indicating a mean age of 39.7 years (See Table 27).

Table 27. Mean of Age by Resource Location Type

| | N | Mean | Std. Error | 95% Confidence Interval for Mean | |
|--------------|-----|-------|------------|----------------------------------|-------------|
| | | | | Lower Bound | Upper Bound |
| Library | 65 | 39.71 | 1.46 | 36.78903578 | 42.62634884 |
| Personal | 13 | 42.85 | 2.62 | 37.14074119 | 48.5515665 |
| Other | 60 | 41.52 | 1.53 | 38.45547675 | 44.57785658 |
| Total | 138 | 40.79 | 0.99 | 38.83922933 | 42.74048081 |

Differences were evident among age groups when resource media types were reclassified by medium (See Table 28). Electronic resources were the most commonly reported resource type, accounting for nearly 2/3 of total reported cases. Those falling in to the 30-39 age range were most likely to make use of electronic resources, but those falling in the 40-49 year age group were equally likely to use electronic resources as those between 20-29. Print resources were most likely to be used by the 50+ age group (42.9%), followed by the 40-49 group at 33.3%.. Use of 'other' resources was most likely to be used by the 40-49 age group (42.9%), The 20-29 were least likely, reporting at 10.7%.

Table 28 Association of Resource Media Type and Respondent Age

| Resource Media Type | | Age Range | | | | Row Total |
|---------------------|------------|-----------|-------|-------|-----|-----------|
| | | 20-29 | 30-39 | 40-49 | 50+ | |
| Print | Count | 3 | 3 | 8 | 10 | 24 |
| | Row % | 12.5 | 12.5 | 33.3 | 42 | 100 |
| | % of Total | 2.1 | 2.1 | 5.7 | 7.1 | 17.1 |
| Electronic | Count | 23 | 28 | 23 | 14 | 88 |
| | Row % | 26.1 | 31.8 | 26.1 | 16 | 100 |
| | % of Total | 16.42 | 20 | 16.4 | 10 | 62.9 |
| Other | Count | 3 | 5 | 12 | 8 | 28 |
| | Row % | 10.7 | 17.9 | 42.9 | 29 | 100 |
| | % of Total | 2.1 | 3.6 | 8.6 | 5.7 | 20 |
| Total | Count | 29 | 36 | 43 | 32 | 140 |
| | % of Total | 20.7 | 25.7 | 30.7 | 23 | 100 |

Open-Ended Questions.

Respondents were asked to comment “on your use of scholarly articles and how that has changed in the last few years.” Numerous respondents took the opportunity to expand on the topics explored in other survey questions. These responses provided substantive and telling comments. Examination of these responses reveals a few major themes: 1) favor of and increased use or reliance on electronic resources; 2) increased convenience of using electronic resources; 3) reliance on university resources; 4) and continued use of print resources as a supplement to electronic resources.

Favor of and increased use or reliance on electronic resources

The overwhelming number of respondents used the opportunity of an open -ended question to express a growing reliance on electronic resources. One respondent put it most succinctly: *"I now have a great reliance on online journals. Online journal access is a must! I feel it is more time-efficient and cost-effective."*

Similar sentiments were expressed repeatedly in numerous responses.

- *"How did we ever get along without electronic journals?"*
- *"I primarily use electronic access now, and much prefer it."*
- *"I'm using more web-based articles, e.g. from JSTOR."*

Several respondents commented on the overwhelming prevalence of electronic resource usage, many noting that all or most of their access is now electronic:

- *"Almost all scholarly articles that I read, apart from journals to which I subscribe, are those that are able to be accessed electronically"*
- *"Increased reliance on electronic journal whereas previously sought subscriptions and library hard copies."*
- *"I use electronic databases and electronic copies of research papers almost entirely now."*
- *"Never physically been to the library: Everything needed is accessed via the web."*
- *"I now almost never go to the library to access article."*
- *"I find electronic versions of print journals extremely convenient."*
- *"Almost all scholarly articles that I read, apart from journals to which I subscribe, are those that are able to be accessed electronically."*
- *"Everything I need (journal articles etc), is online and I read all articles from my desk."*
- *"Since being employed at the University, a high percentage of the scholarly articles I read are accessed electronically."*
- *"For me, by FAR the most common method of journal use is using specific searches on databases, downloading the article, scanning it and printing copies of those articles that will be of use."*
- *"There are a number of journals (20) in my field of research which I scan regularly mainly from electronic contents pages."*

Some researchers noted, however, that while electronic access is a great boon to users, there are still notable shortcomings:

- *"Electronic access is the best thing to have happened to journals in years for both students and staff. Let's have more of it e.g. textbooks, major reference works. I'm not sure why paper journals even exist or are subscribed to by the library. However I do download to read whole articles as screens are too difficult for longer articles."*
- *"I think it is wonderful that they are available online, the difficulties are that sometimes the files are too large to download, or subscribing to an alert 'experiencing technical difficulties'."*

Increased convenience of using electronic resources

Respondents also commented on the increased convenience of using electronic resources, which have led to some changes in their reading patterns or amount of reading. Many also noted the *"increasing use of journal alert services"* as well.

The overall tone of discussion was typified by the following comment: *"When doing literature surveys, I will always look for the electronic copy of a journal article as this is much easier to access and saves time."* Other responses echoed or elaborated on this thought:

- *"Having articles available online or through electronic databases has increased the number of articles that I am able to access and read - much more time efficient as I can do searches from my office or from home."*
- *"When doing literature surveys, I will always look for the electronic copy of a journal article as this is much easier to access and saves time. "*
- *"The ability to search the databases from my computer, and the ability to access most things on-line and print them out has changed the way I do my work at a fundamental level. As an RA I use to be paid to run around finding articles and photocopying them (not particularly rewarding work), now that getting the articles to read takes about 10% of the time it use to, I get to things like analyse the data and write articles and books. It has been a fantastic difference."*
- *"I make much more use of electronic alerts on specific topics."*
- *"Review of scholarly articles is significantly easier than it used to be. Most journals now have electronic versions that allow instant access rather than spending hours in the library or waiting for document delivery. This assists in the preparation of papers as well as being useful for people who work in the field but have access to university library databases (helps EBP)"*
- *"Electronic access to a journal is an absolute priority. Only having access to a physical copy when electronic access is provided by the publisher is not acceptable. It results in wasted time for borrowing/photocopying/scanning etcetera."*

- *"I'm far more likely to use full text articles now than, say 5 years ago - mostly because of the increased availability of work online. It's far more convenient, both for research and for communicating the work to students in online teaching."*
- *"I much prefer online to paper journals. I will do my best to avoid walking to the library if I can make do with another article that is available online!"*
- *"Much more use being made of electronic journal awareness services (with direct links to recently published issues of journals) and electronic databases."*
- *"Electronic access has meant there is a greater pool of scholarly articles available for my research but there seems less time to read them."*

Reliance on university resources

Survey respondents that chose to provide comment via the open ended question expressed a greater degree of reliance on resources, both print and electronic, provided by the university library system. The factor of convenience is reiterated in many comments, although a few note the increasing cost of academic journals subscriptions as reason for increased dependence.

- *"My use of electronic subscriptions via the library has increased"*
- *"Most of my reading of scholarly articles is now from electronic journals in the university library."*
- *"With the exception of journals that are delivered to me personally, <10% of the articles I use are in printed format, the vast majority are electronic (from the databases supplied by the University)."*

- *"I download a lot of articles electronically through the university access. When I cannot access journals electronically, I obtain them through document delivery. I spend a lot of my time finding articles via PubMed and obtaining them through the university. The system for obtaining journal articles through the university is efficient and valuable."*
- *"Given the increased access to electronic journals through the UQ library and email alerts from favoured journals I have found the actual physical time spent in the library has reduced dramatically and most articles are read on-line."*
- *"I always like to use scholarly articles in my work. I find being convenient to the UQ University library and its resources, including the database, is highly convenient."*
- *"Many of the articles that I now look for are accessible online through the UQ library - which is great to be able to do from my office. Can also look through them and print the ones that are relevant (rather than in the library where I generally don't look at things too hard & will often copy un-necessarily)."*
- *"Certainly this university has excellent access to high level resources and this has made it easier for me to use be successful in obtaining articles, which has motivated me to access them more frequently. Access to electronic resources has also made it easier and therefore my use has increased."*

As previously noted, some respondents suggested that the increasing cost of resources is a key factor in their dependence on university-provided resources:

- *"I depend more and more on the University purchasing online rights to various journals and appreciate the fact that I can download these articles at my convenience."*
- *"As cost of subscriptions has increased over time, much more reliance on library subscriptions."*

Continued reliance on print resources as a supplement to electronic resources

While an overwhelming number of respondents expressed that electronic resources constitute the majority of their academic journal access and activity, many took the time to note that they still have some degree of reliance on print resources. The motivations range from practical to esoteric as expressed in the following comments:

- *"I find scholarly articles absolutely essential. It's very useful to have so many of them on-line now and I think that has increased my reading of journal articles and improved research. Still, I find the paper versions very useful as well."*
- *"I've gradually found that the constraints of time mean that I now use electronically available publications almost exclusively. While I will occasionally go to the library for books (if appropriate), I now very rarely go for journal articles that are not available electronically. In order for me to go, they must have a direct and immediate relevance to my work (which I find sad, really). However, I much prefer to read the articles in print form (i.e. downloaded), as I make copious notes/under linings on the pages."*

The continued use of print resources highlights a potential shortcoming of electronic resource subscriptions--limited access to back issues:

- *"I use electronic access routinely now. But I strongly value the print subscriptions for back issues which are not covered by databases and for journals with no online access."*
- *"Most recent publications have been obtained electronically in the last few years. Older articles still have to be photocopied from the library resources."*

While 'browsing' has taken on an entirely new context in the age of the World Wide Web, it holds an entirely meaning for some researchers:

- *"I still like to venture to the library on Friday afternoons to browse through newly arrived (and older) journals as a satisfying way of broadening my horizons as an accomplished researcher and thinker. There is helpful nostalgia in this, as gazing into my computer screen for most of each day often shifts my attention away from the core activity of researching as I know it."*
- *"Electronic articles are good for research but browsing through print copies is the main way I pick up new ideas."*

Along the same lines, at least one respondent laments the possibility of lost inspiration:

- *"Our University library has fabulous access to electronic and print journals and I have no need of personal subscriptions. I find that I rarely visit the library in person as I used to, but search for specific terms when necessary (e.g. preparing*

manuscripts). I used to pick up a journal, visually scan the contents, replace the journal, pick up the next one (even if it is peripheral to my interests) and scan the contents, etc. With electronic access this cannot really be done and I suspect that I am missing article that may lead me in new directions, etc. as my searches are now more focused and linear."

Less prominent trends/ other commentary

A few respondents commented on their reading habits and their use of academic literature, without reference to use of electronic resources:

- *"I rarely read an article through but rather scan material relevant to my research, writing and teaching needs."*
- *"Where an article appears to be of importance to a current research project, I will ask my RA to obtain a copy."*
- *"I find that specialist journals are increasingly more accessed than general disciplinary journals."*

Several respondents lament the fact that changes in their work responsibilities have negatively impacted their scholarly reading behavior:

- *"I have many more managerial tasks that limit my reading of articles to skimming, and passing onto research staff and pages."*
- *"I've had a lot less time to read scholarly articles in the past 5 years, due to a combination of co-editing a journal 2001-4 and co-authoring a major textbook*

and its companion website. Now most of what I read I can access electronically at my office, so I don't browse as much as I used to either. I'm now getting back into reading, I hope! "

- *"I have a heavy teaching load and normally have little time for additional reading. However, at the moment I am working on a monograph with colleagues in the USA. I read a large number of scholarly articles whilst on SSP in Semester 2 of 2004 and I am able to undertake a lot more research than usual at the moment because of pressure to complete the monograph by August."*
- *"I have far, far less time to read articles than I used to. Hence my reading is more superficial and usually scanning for specific purposes rather than for general increasing of knowledge."*

Summary.

In summary, the reading patterns of UQ academic staff are very similar to their counterparts in U.S. universities and at UNSW. There are some differences, however. For example, UQ staff are less likely to use personal subscriptions, less likely to find articles by browsing, and rely slightly more on library electronic collections.

It is difficult to know whether these variations are due to differences in the UQ information context (library collections), differences between Australian and American academics, current changes/trends (the U.S. surveys were conducted between 2000-2003), or other reasons. Five U.S. universities were surveyed in the latter half of 2005 and we

are now running comparisons between UQ and UNSW and between both Australian universities and the current U.S. surveys. We will examine these in more detail in subsequent publications.

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Journal Use & Reading Patterns - Staff Survey

SECTION 1: - SCHOLARLY JOURNAL ARTICLE READING

1. In the **last 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.

Number of articles read in the past 4 weeks: articles.

The following questions in this section refer to the **SCHOLARLY ARTICLE YOU READ MOST RECENTLY**, even if you had read the article previously. Note that this last reading may not be typical, but will help us establish the range of patterns in reading.

2. What is the title of the journal from which this last article was read **or**, if not from a journal, what is the topic of the article?

Journal Title:

or

General topic of article:

3. If this article was (or will be) published in a specific journal, approximately how many articles did you read from this journal in the **last 12 months**?

Articles read: Not published in a journal Don't know

4. Approximately what year was this article published/posted?

5. Please indicate your best estimate of the time in minutes that you spent reading this article most recently.

6. Had you previously read this article, i.e. is this a re-reading?

7. Prior to your first reading of this article, did you know about the information reported or discussed in this article?

8. If yes, how did you first find out about the information?

- 1. conference/workshop
- 2. informal discussions with colleagues
- 3. listserv or news group
- 4. journal article
- 5. email from colleague
- 6. eprint server (for example, ePrints@UQ)
- 7. web site of author
- 8. Other (please specify)

9. How did you initially **find out** about this last article you read? (Choose only the one best answer.)

- 1. Browsing a personal print subscription
- 2. Browsing a personal electronic subscription
- 3. Browsing a library print subscription
- 4. Browsing a library electronic subscription
- 5. Browsing a print subscription copy in a school, department, etc. collection
- 6. Browsing other electronic collection (please specify)
- 7. I (or someone on my behalf) was searching an indexing/abstracting database
(e.g., Web of Science, Medline, ERIC, Compendex)
- 8. I (or someone on my behalf) was searching a Web search engine
(e.g., Google, Yahoo, AltaVista, Excite)
- 9. I (or someone on my behalf) was searching Online journal collections
(e.g., HighWire, ScienceDirect)
- 10. Sent to me as part of an alerting service
- 11. Received from a listserv or newsgroup
- 12. Cited in another publication
- 13. Another person (e.g., a colleague) told me about it
- 14. Don't know or other (please specify)

10. In what form was the article when last read? (Choose only the one best answer.)

- 1. Print copy (e.g., print like in a journal)

- 2. Photocopy
- 3. Facsimile copy
- 4. Online computer screen
- 5. Previously downloaded/saved and read, on computer screen
- 6. Downloaded and printed
- 7. Other (please specify)

11. Where were you when you read this article?

- 1. In my office or lab
- 2. University library
- 3. At home
- 4. Travelling
- 5. Other (please specify)

SECTION 2 – PURPOSE & CONSEQUENCES OF THE LAST ARTICLE READING

12. For what purposes have you used, or do you plan to use, the information obtained from the article you last read?

a. Principal Purpose (choose only one):

- 1. Research
- 2. Teaching
- 3. Administration
- 4. Current awareness/keeping up
- 5. Writing proposals, reports, articles, etc.
- 6. Consulting, advising others
- 7. Presentations
- 8. Other (please specify):

b. Secondary Purpose(s)--If you read the article for more than one purpose, what were your secondary purposes for reading it? (Choose all that apply.)

- 1. Research
- 2. Teaching
- 3. Administration

- 4. Current awareness/keeping up
- 5. Writing proposals, reports, articles, etc.
- 6. Consulting, advising others
- 7. Presentations
- 8. Other (please specify):

13. In what ways did the reading of the article affect the principal purpose?
(Choose all that apply.)

- 1. It improved the result
- 2. It narrowed/ broadened/ changed the focus
- 3. It inspired new thinking/ideas
- 4. It resulted in collaboration/joint research
- 5. It resulted in faster completion
- 6. It resolved technical problems
- 7. It saved time or other resources
- 8. It wasn't helpful; it wasted my time
- 9. Other (please specify):

14. How important is the information contained in this article to achieving your principal purpose?

- 1. Not at all important
- 2. Somewhat important
- 3. Absolutely essential

SECTION 3: - DEMOGRAPHICS

15. What percentage of your work time do you spend doing the following? (The total should equal 100%)

- 1. Research and research training
- 2. Teaching and learning
- 3. Management and resources
- 4. Community partnerships
- 5. Consulting/advising
- 6. Other (please specify)

16a. Please indicate your school or your professional field (e.g., history, chemical engineering, physiotherapy, economics, etc.):

16b. On which campus are you located?

17. Please specify your position:

- 1. Professor
- 2. Associate Professor
- 3. Senior Lecturer
- 4. Lecturer
- 5. Associate Lecturer
- 6. Teaching Assistant, Tutor or Fellow
- 7. Research Assistant or Research Fellow
- 8. Other (please specify)

18. Please indicate your highest degree attained:

Year

received

19. What is your age?

20. Gender:

21. In the past **two years**, how many:

- a. Articles in refereed scholarly journals have you published? articles
- b. Non-refereed articles have you published? articles
- c. Chapters in books, proceedings, etc. have you published? chapters
- d. Entire books have you published? books
- e. Other (please specify)

22. For the last refereed scholarly article that you published:

a. How many co-authors did you have, if any?

b. How was the research that produced that article funded? Check all that apply.

- 1. Government grant
- 2. Industry grant or contract

- 3. University-provided grant
- 4. As part of my role at University (not specifically funded)
- 5. Other (please specify)

23. In the past **two years**, have you received any awards or special recognition for your research or other profession-related contributions?

24. How many personal subscriptions to professional journals do you receive, including those obtained as a member of a professional society? (Personal subscriptions are those which are **personally addressed to you** at your home, office, or lab.)

- a. Subscriptions paid myself
- b. Free subscriptions
- c. Subscriptions purchased by grant or other source for personal use
- d. Subscriptions purchased by grant or other source for shared use
- e. How many of these are electronic subscriptions?

25. Additional comments on your use of scholarly articles and how that has changed in the last few years

Thank you!

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