

# PUBLICATIONS OF AUSTRALIAN LIS ACADEMICS IN DATABASES<sup>1</sup>

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## Abstract

This paper examines aspects of journal articles published from 1967 to 2008, located in eight databases, and authored or co-authored by academics serving for at least two years in Australian LIS programs from 1959 to 2008. These aspects are: inclusion of publications in databases, publications in journals, authorship characteristics of publications, productivity, and subject content of publications over time. Results indicate that national and LIS-specific databases provided adequate coverage; however, no single database provided over half of all publications. More than half of all articles were published in national journals focusing on aspects of LIS in Australia; however, there is a trend for increasing publications in international journals. Most of the earlier publications had one author, but multiple authorship in publications has increased since 1999. Overall the number of publications per LIS academic is low; however, per capita productivity has been increasing since the mid-1990s. Finally, titles of articles reveal a shift from library-related terms to information-related terms.

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# Introduction

In 1959 the first LIS school in higher education institutions was established by John Metcalfe at the University of New South Wales, aiming to develop LIS education and research in Australia (Metcalfe 1959).<sup>2</sup> Since then LIS schools have been established around Australia and hundreds of academics have worked in the field (Wilson et al. 2010). While developments in Australian LIS education and their implications have been discussed earlier (see for example, Hallam 2007, Harvey & Higgins 2003, Rochester et al. 1997), there has not been a comprehensive investigation of the publications produced by Australian LIS academics working over an extended period, nor the visibility and coverage of these publications in databases. This paper aims to close this gap and to answer the following questions: To what extent are Australian publications by LIS academics covered in databases? Does coverage of publications in databases change over time? How much of the literature is covered in more than one database? What percentage of the literature appears in journals and to what extent are the journal articles by Australian LIS academics in national and international journals? Answers to these questions are particularly important in a general academic climate in which evaluation of research is of increasing importance (Butler 2008).

This paper investigates the presence in selected databases of the publications of Australian LIS academics between 1967 and 2008. Exploring the data along a number of dimensions reveals aspects of Australian LIS academic publishing behaviour including the originating country of the journal, characteristics of authorship in journal articles, and the subject content of the articles as represented by their titles. The overarching question is: Do the journal articles authored or co-authored by Australian LIS academics appear to be adequately represented in LIS-specific databases? Related to this is the question of whether a number of these databases need to be searched to capture what might be a fairly comprehensive collection of these articles. The focus for the data gathering has been on Australian LIS academics and their journal articles; hence, publications of Australian LIS practitioners are not included. The importance of this research goes beyond Australia as it throws light on database coverage in general. It may benefit LIS (or other disciplines) in nations other than Europe and North America conducting similar studies to assess which databases provide the best coverage of their research papers. There is particular value for those publishing in countries which have a relatively small national professional literature and in which there are pressures on academics to publish in international journals.

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2 The generic acronym LIS indicates 'Library or Librarianship'; 'Information or Knowledge'; and 'Science, Studies, Services or Management' used variously in Australian higher education institutions. The term 'school' describes a LIS teaching unit although the unit may be called department, program, etc.

This paper makes the following contribution towards a better understanding of Australian LIS academic literature and its coverage in databases: (1) It investigates the coverage of this literature in different databases; (2) it provides an overview of the journals in which publications have appeared; (3) it scrutinizes publication behaviour of academics over time; and finally (4) it analyzes broad topics academics have investigated over four decades.

## Literature

This paper brings together, and is informed by, two streams of LIS research: studies on database coverage and earlier research examining the characteristics and trends of different sets of publications.

In the *first* stream, studies examine the extent of coverage of the LIS literature in different databases. Over 30 years ago researchers began to compare database coverage using specific LIS topics as benchmarks (Hawkins & Miller 1977). The inclusion and overlap of LIS journals in databases were studied by LaBorie et al. (1985) and more recently by Chen (2006) and Boell (2010). Another approach compared the coverage of individual LIS journal articles in different databases (Jacsó 1998; Walters & Wilder 2003). Our study contributes to this literature by investigating the coverage of databases for publications produced by LIS academics in Australia. An understanding of which databases yield the best results may therefore aid LIS researchers and those purchasing access to databases in higher education institutions.

The *second* stream relates to the bibliometric analysis of characteristics and trends for different sets of publications in LIS. Example of LIS studies investigating publications on different topics include: burnout of librarians (Blazek & Parris 1992), school librarianship (Clyde 2004), literature about bibliometrics (Patra et al. 2006), digital libraries (Singh et al. 2007), and subject indexing (Tsay 2004). Results from such studies can provide insights into various distributions of publications: in journals, among authors, and over subject areas (Wilson, 1999).

In addition to topic-oriented studies, numerous studies use databases for analyzing research at the institutional, country, or geographical region level. Most notable is a series of papers investigating LIS publications in North America for almost four decades between 1966 and 2004 using the *Social Sciences Citation Index* (Hayes 1983; Budd & Seavey 1996; Budd, 2000; Adkins & Budd 2006, 2007). Other North American LIS studies use the *Library Literature* database (Wallace 1990; Boyce & Hendren 1996).

Beyond North America, researchers have conducted surveys of publications by academics from other countries or regions: He and Wang (2006) looked at China; Åström (2008), the Nordic countries; Park (2008), the Asia-Pacific region.

Results from such studies show the characteristics of authorship over time and reflect on the productivity of LIS academics, the number of authors collaborating on papers, or changes in topics researched. Such studies are often undertaken using only single databases. Studies such as that by Pettigrew and Nicholls (1994) which investigated multiple databases are rare. However, coverage of journals in single databases is limited when compared to the number of publications that can be found when using multiple databases (Hood & Wilson 2001). Yerkes and Glogowski (1990) demonstrated that coverage of the LIS literature varies between databases; Meho and Yang (2007) found considerable differences in citations to LIS publications listed by the *Web of Science* and *Scopus*; and Meho and Sugimoto (2009) identified differences in the coverage of the same LIS journal in different databases.

Informed by these two literature streams, this paper investigates the presence in selected databases of the publications of Australian LIS academics between 1967 and 2008 and explores coverage of Australian LIS literature in databases; the journals in which Australian LIS academics have published; the characteristics of authorship; and the number of publications over time.

## Method

From a comprehensive list of Australian LIS academics working in the field for fifty years (1959 to 2008), author searches over multiple databases were conducted. The list includes all academics working in Australian LIS schools at higher education institutions which initially included universities, colleges of advanced education (CAEs) and teacher colleges; the latter two types of institutions eventually became (or were absorbed into) universities in the early 1990s. This list of academics was compiled and cross-checked using numerous sources including: academic handbooks or calendars in print, microfiche and electronic form; Commonwealth Universities Yearbooks; directories of Australian LIS professionals; web resources; journals and newsletters (Wilson et al. 2010). In total 693 academics working in the field from 1959 to 2008 were identified. This list included 311 people who worked as LIS academics for only one or two years, many in tutor (teaching assistant) or lecturer (usually casual) positions. A search of *Library and Information Science Abstracts* (LISA) for these 311 academics located only 20 publications, so we decided to concentrate searching efforts on multiple databases for the 382 people who had worked as academics for more than two years.

Eight different databases were searched for the publications of each of those 382 academics. To minimize the retrieval of incorrect records, author searches of Australian LIS academics were combined with ranges of years consisting of the overall time academics worked in one of the Australian LIS schools plus an additional two years to cover publication time-lag. During the study period,

some academics moved between practice and academia. As far as they are identifiable, only publications produced during their time as academics are included in this study (Wilson et al. 2010). The databases searched included major international LIS databases: *Library and Information science Abstracts* (LISA), *Library Literature and Information Science* (LLIS), and *Library Information Science and Technology Abstracts* (LISTA). *Information Science and Technology Abstracts* (ISTA) was not searched as it is now mostly incorporated into LISTA (Boell 2010), making it somewhat redundant (Jacsó 2007). These LIS-specific databases were complemented by the *Science Citation Index* (SCI), the *Social Sciences Citation Index* (SSCI), and the *Arts and Humanities Citation Index* (AHCI). SSCI is generally the database of choice for compiling lists of LIS publications in North America or Europe. In addition, two databases of special relevance in the Australian context were searched: *Australian Library and Information Science Abstracts* (ALISA) and the *Australian Education Index* (AEI+). As authors were searched by name, the three citation databases and AEI+ would identify some of the publications by these authors in non-LIS fields.

Publications retrieved from any of the eight databases were then collated into a single data set. *Refworks* (<http://www.refworks.com>) was used for this process as it provided sufficient import filter for the records exported from each database. It thus allowed the unification of records from all searched databases. During this process duplicate entries for publications retrieved from more than one database were removed while any additional metadata (mostly keywords and abstracts) were retained. The result was a list of unique publications with various fields, one of which indicated in which database each publication was found.

Finally, visualizations of the 50 most common keywords in the titles of the journal articles for four time periods were created using the word frequency analysis of the *NVivo* qualitative data analysis computer software ([http://www.qsrinternational.com/products\\_nvivo.aspx](http://www.qsrinternational.com/products_nvivo.aspx)). Common words were excluded from a stop word list, and a stemming filter was applied to conflate counts for similar words: for example, 'library' and 'libraries' were counted as 'library'.

## Results and Discussion

The results are introduced and discussed from the following perspectives: database coverage, journals in databases, characteristics of articles in journals, and subject coverage as reflected in titles of journal articles.

### ***Examination of database coverage***

Results from the eight databases varied widely, both with regard to the number of records obtained from each database and with regard to the document types indexed in each database: for example, books, chapters in books, conference

material and journal material. Journal material can be research-related (e.g., research articles or review articles), or non-research related (e.g., letters to the editor, editorials, obituaries, book reviews, and conference reports).

In terms of the number of records obtained from each database for the 382 LIS academics, the results ranged from 40 (AHCI) to 1,938 (LLIS) records (Table 1). Generally the fewest number of records were found in the three citation indexes published by Thomson Reuters, forming the major sources in the *Web of Science* (WoS). This indicates that the WoS (used routinely to search for publications by North American LIS academics) is generally not a good source for publications by most Australian LIS academics. Alternately, Australian LIS educators need to publish in international journals (indexed in international databases such as WoS) to gain visibility in the global research arena; since 2000, this practice has been increasing.

*Table 1:* The number and percentage share of document types in publications by Australian LIS academics for each of eight databases, 1967-2008.

	ALISA	LISA	LISTA	AEI+	SSCI	SCI	AHCI	LLIS	Total
<b>Journal articles<sup>1</sup></b>	692	1088	636	905	245	87	21	604	4278
% share in Database	55.1%	75.7%	53.9%	47.8%	71.0%	86.1%	52.5%	31.2%	
<b>Other journal material<sup>2</sup></b>	19	167	318	17	92	10	18	1237	1878
% share in Database	1.5%	11.6%	26.9%	0.9%	26.7%	9.9%	45.0%	63.8%	
<b>Conference material</b>	256	79	115	506	8	4	1	23	992
% share in Database	20.4%	5.5%	9.7%	26.7%	2.3%	4.0%	2.5%	1.2%	
<b>Book material<sup>3</sup></b>	134	66	66	254	-	-	-	37	557
% share in Database	10.7%	4.6%	5.6%	13.4%	-	-	-	1.9%	
<b>Book chapters</b>	156	37	45	213	-	-	-	37	488
% share in Database	12.4%	2.6%	3.8%	11.2%	-	-	-	1.9%	
<b>total</b>	<b>1257</b>	<b>1437</b>	<b>1180</b>	<b>1895</b>	<b>345</b>	<b>101</b>	<b>40</b>	<b>1938</b>	

<sup>1</sup> includes reviews

<sup>2</sup> Other Journal Material includes mainly book reviews, and also other material such as editorials, obituaries, conference reports, etc.

<sup>3</sup> Book Material included: books, theses, reports, and bibliographies.

With regard to different document types published by the 382 LIS academics, Table 1 shows marked differences. First, journal articles are the most common form of publication indexed for Australian LIS academics. These are followed by conference-related publications, with the fewest records found for books and book chapters. Secondly, it can be deceptive to look only at the total numbers of records retrieved from each database. While most records were found in LLIS, many were book reviews. When looking only at journal articles, LLIS falls behind ALISA, LISA, LISTA and AEI+. Thirdly, the results indicate the relative importance of Australian databases, especially AEI+. This is somewhat surprising as ALISA could perhaps be expected to fare better in covering Australian LIS literature. However, ALISA ceased publication in 2005 and only

provided few records for the period after 2000. Finally, different databases specialise in different content. For instance, the three citation databases do not cover books or book chapters and the only LIS-related conferences included are the *ASIST Proceedings*. The remainder of the results and discussion focus only on journal articles.

## Journal articles in databases

After removing all material other than journal articles and all duplicate entries for the journal articles from multiple databases, there were 2,232 unique journal articles.<sup>3</sup> Figure 1 plots the number of journal articles found for each year and the number of LIS academics working in the field for more than two years. The number of academics can be seen to fluctuate, with a steady decline from the mid 1990s; this is not always the case with the number of publications. While searches were conducted back to 1959, journal articles were only found for 1967 onwards. The reason for this is due in part to the time period covered by the databases. For instance LLIS started only in the 1980s and for most of the other databases, the coverage of articles before 1980 is sparse with LISA being the only noteworthy exception (Table 2).

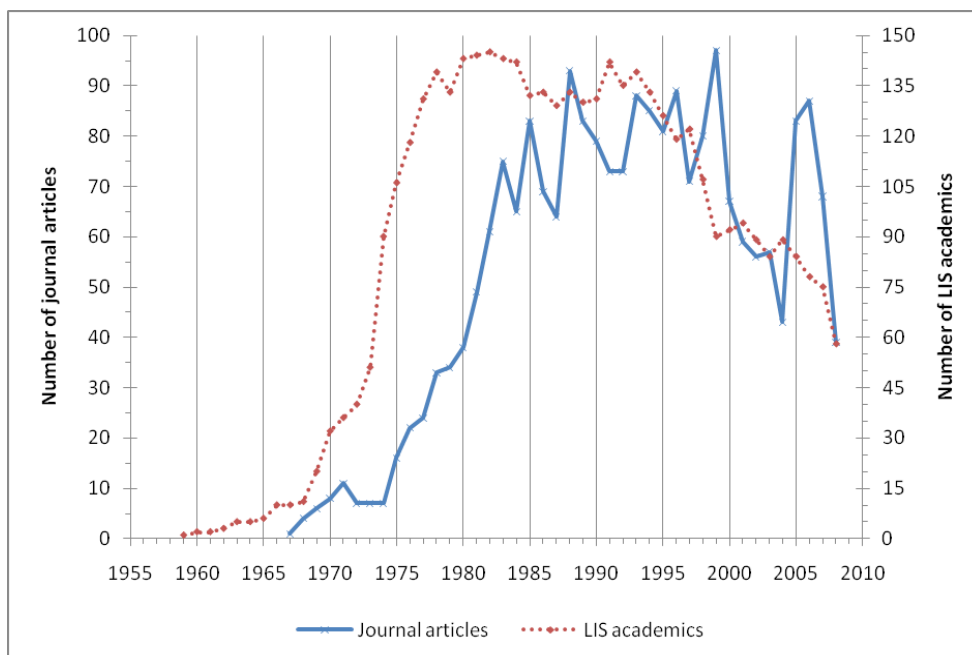


Figure 1: Number of unique journal articles authored by 382 longer-serving Australian LIS academics (1967-2008), and the number of such academics in Australian LIS programs (1959-2008), per year. Data used is from Wilson et al. (*in press*).

Generally the number of articles retrieved indicates that the output of journal articles by Australian LIS academics increased after the mid 1970s. It seems

<sup>3</sup> In a related study (Wilson et al. *in press*) there were 2,235 unique articles for all years. Further analysis for this study identified three additional duplicates which were removed.

therefore that there may be a time lag between the increasing number of academics working in the field and an increasing number of journal articles found in databases. A similar effect can also be found around 2000 when the number of publications drops following a decline in the number of LIS academics in the late 1990s. In this context the spike around 2005 to 2006 is perhaps noteworthy. This spike occurs at a time when there was discussion in Australia of introducing a research evaluation exercise, the Research Quality Framework (RQF), which would include assessment of the number and quality of journal publications by academics. Hence, research and publishing activities increased (Steele et al. 2006). The RQF was dropped following the 2007 federal elections: however national research evaluation continues in the form of the ERA 2010 ([http://www.arc.gov.au/era/era\\_2010.htm](http://www.arc.gov.au/era/era_2010.htm)) and the ERA 2012 ([http://www.arc.gov.au/era/era\\_2012/era\\_2012.htm](http://www.arc.gov.au/era/era_2012/era_2012.htm)). Overall there is a clear pattern for an increasing number of publications since 1980 followed by a relatively stable period in the 1980s and 1990s.

While declining academic staff numbers may account for part of the decrease of publications in the 2000s, Table 2 indicates that database coverage may be another reason. ALISA had reasonable coverage of journal articles in the 1980s and the 1990s; it was the second most productive database for both decades. From 2000, however, coverage of articles in ALISA decreased, ceasing completely after 2004. In addition, there is a declining coverage in AEI+ over the years. Whether or not ALISA's lack of coverage is one of the reasons for the decline in the number of publications found after 2000, the demise of ALISA itself is not healthy for LIS in Australia. Moreover, the decline in numbers of

*Table 2: The number of journal articles by Australian LIS academics retrieved from each of eight databases, and the total number of unique journal articles, in five periods from 1967-2008.*

<b>Years</b>	<b>1967-1969</b>	<b>1970-1979</b>	<b>1980-1989</b>	<b>1990-1999</b>	<b>2000-2008</b>	<b><i>Total all years</i></b>
<b>ALISA</b>	0	0	380	293	19	<b>692</b>
<b>LISA</b>	8	128	305	386	261	<b>1088</b>
<b>LISTA</b>	3	27	96	213	297	<b>636</b>
<b>AEI+</b>	0	22	434	271	178	<b>905</b>
<b>SSCI</b>	0	10	57	94	84	<b>245</b>
<b>SCI</b>	0	1	6	30	50	<b>87</b>
<b>AHCI</b>	0	0	7	10	4	<b>21</b>
<b>LLIS</b>	0	0	106	275	223	<b>604</b>
<b>Total unique journal articles for each period in all databases</b>	11	169	677	816	559	<b>2232</b>



articles found in both Australian databases is evident from the 1990s while the total number of publications during that decade was still increasing. Furthermore, there are other databases that improve coverage over time, for example SCI and LISTA. Finally, numbers for LISA and LLIS would also indicate a drop in the total number of publications since 2000; this would be consistent with the decline in LIS academic staff numbers.

### Database coverage of journal articles

Roughly one-half of all records (49.7%) can be found only in one database with all databases returning some unique records (between 13.9% and 57.1%), thus warranting a search on multiple databases for those seeking more comprehensive coverage (Table 3). However, as can be seen in Table 3 databases varied in their contribution of unique articles. Almost one-third of all unique articles can be found in LISA. This makes LISA the most productive database for searching Australian LIS articles. Not only were most articles found in LISA; LISA also contained the greatest share of unique articles (with the exception of AHCI which has negligible database coverage). One word of caution regarding the coverage of more current LIS research: some of LISA's advantage may be explained by its near monopoly for publications prior to 1980 (Table 2). Furthermore, LISTA's coverage of literature published since 2000 is somewhat greater than LISA's (Table 2).

*Table 3: The number and percentage share of unique journal articles by Australian LIS academics per database, 1967-2008.*

	ALISA	LISA	LISTA	AEI+	SSCI	SCI	AHCI	LLIS	Total
Only this database	123	358	168	293	34	14	12	108	1110
% unique	17.8	32.9	26.4	32.4	13.9	16.1	57.1	17.9	49.7

Looking at the number of unique articles in Table 3, two further points are noteworthy. First, even though AHCI contributed only a small number of records, most of the articles found through AHCI were unique in the sense that they could only be found by searching AHCI. Secondly, while regrettable, the demise of ALISA may be tolerable when searching for Australian LIS literature; as the total loss of unique records (123) is only about 6%. This is somewhat surprising given the relative dominance of journal articles in Australian LIS journals; however, explained in part by the demise of many national journals over the 1967-2008 period (see Figures 2 and 3 below).

Regarding the document types indexed in the different databases, the findings indicate that for non-journal publications of Australian LIS academics (i.e., conference materials, books and book chapters) AEI+ and ALISA are the most useful databases to search (see Table 1). For book reviews LLIS is the most productive database. However, if journal articles are the matter of interest, all databases make a substantial contribution.

## Examination of Journals

Australian LIS academics published in a wide range of journals, with Australian journals being the most important outlets. The 2,232 articles published by Australian LIS academics appeared in 469 different journals. However, not all articles found are 'original' research articles. For example, articles of a few pages in the news magazine *Incite* were included as were articles of over 100 pages in the *Annual Review of Information Science and Technology*.

The distribution of articles over journals is highly skewed. Australian LIS academics published in 233 journals (of 469) only once. This skew is also apparent in publications over the first 38 journals represented in Figure 2. More than half of all publications appeared in the 38 journals, with more than a quarter of all publications being published in the top five journals, all of which are Australian national journals. In fact all of the 16 journals in which Australian LIS published most frequently are national journals. This underlines the importance of national journals for LIS in Australia as well as the need for

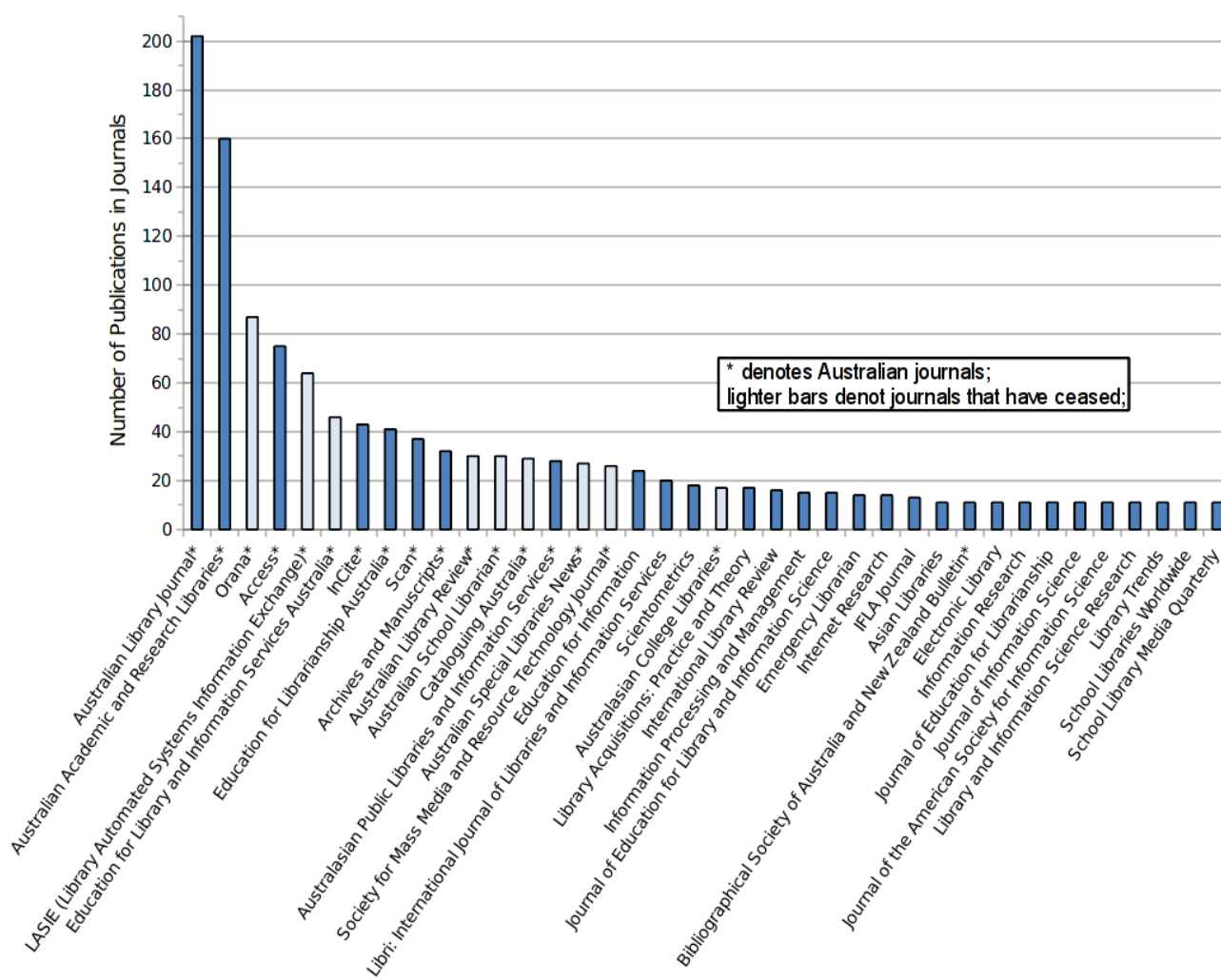


Figure 2: Journals with >10 articles each by Australian LIS academics, in decreasing number of articles per journal, from 1967-2008. Total number of articles = 2,232, in 469 journals; number of articles in journals with >10 articles each = 1,261 (56.4% of total), in 38 (8.1% of total) journals.

Australian LIS academics to publish in international journals (indexed in international databases) to gain visibility in the global research arena.

As most of the journals in which Australian LIS academics published most frequently (Figure 2) were Australian and have ceased, a valid question is: have there been changes in the importance of Australian journals over time? Further investigation of the ratio of international versus national journals is provided by Figure 3. The erratic pattern in the years up to the early 1980s can be explained in that prior to 1980 there were only a few publications indexed by databases (Figure 1). However, when publications exceed a threshold of an annual output of 50 indexed publications in 1981 the pattern becomes less erratic.

Over the last 30 years there has been an increasing trend for Australian LIS academics to publish in international journals. National journals still play an important role in the Australian LIS discourse (Figure 3) in terms of engagement with the LIS profession in Australia. Moreover, as publication behaviour regarding international journals has changed over time it is a valid question to ask if other patterns regarding journal publications have changed over time as well.

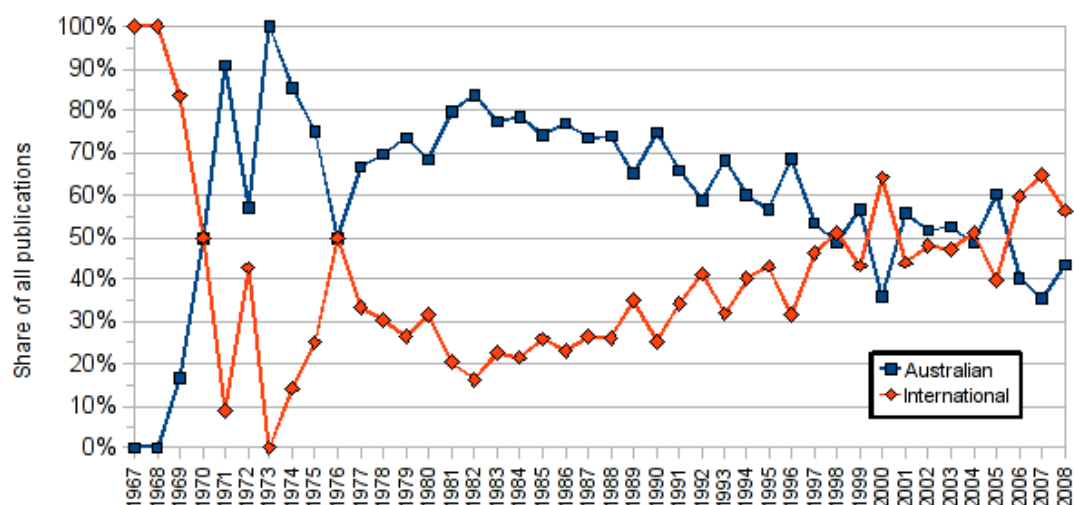


Figure 3: Percentage share of journal articles by Australian LIS academics in national (Australian) and international journals, 1967 to 2008.

## Examination of Publications

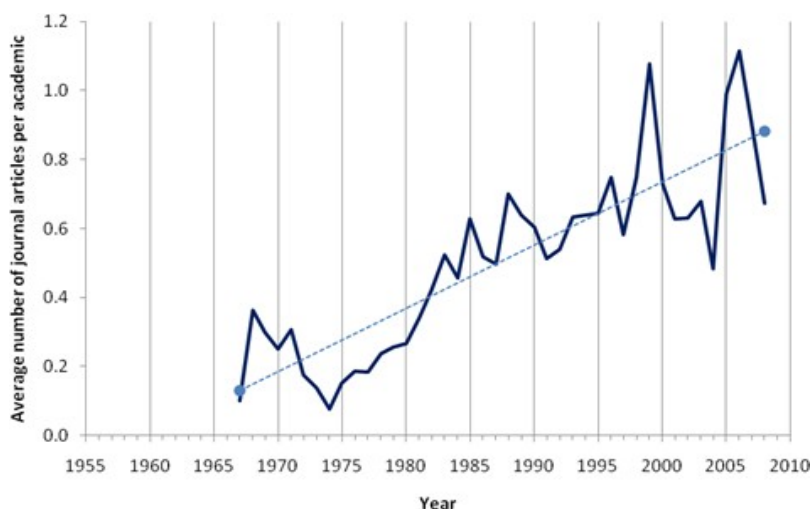
Another indicator of publication behaviour is to look at patterns of authorship and collaboration over time. Table 4 shows that over the complete timeframe, close to three-quarters (72%) of the 2,232 journal articles had one author. However, an increasing trend to collaborative publication and a decrease of single authorship is also apparent: between 1967 and 1978, most (88%) of the

articles were singly authored; however, by 1999-2008, single authorship dropped to just over a half (57%). As a result, over the four time periods the average number of authors per article rose steadily from just over one to nearly two authors in the last period.

*Table 4:* The number of journal articles by Australian LIS academics by the number of authors per article, in four time periods, 1967-2008. The average number of authors in each time period is also shown.

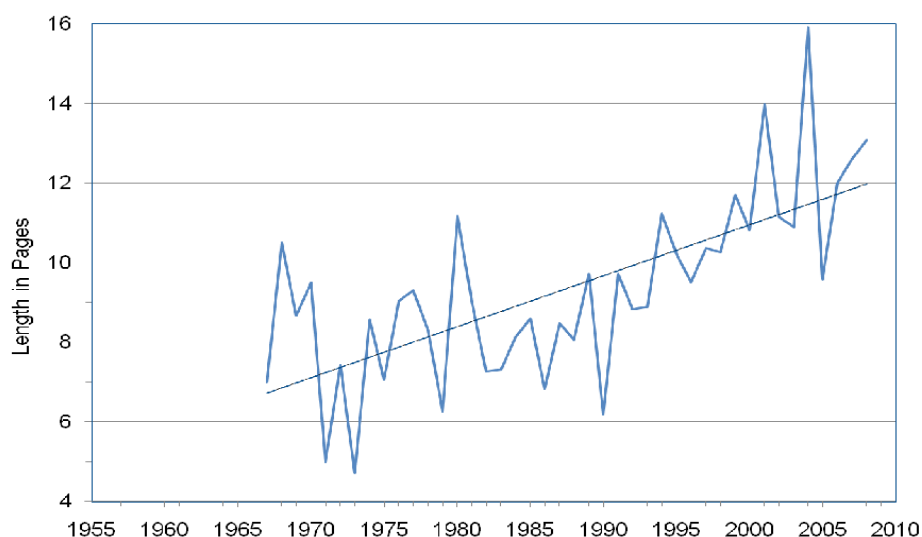
Number of Authors per Article	Number of Journal Articles				all years
	1967- 1978	1979- 1988	1989- 1998	1999- 2008	
1	129	524	577	377	1,607
2	11	79	182	163	435
3	4	16	31	74	125
4		4	7	27	38
5		2	2	9	13
6	1	2		4	7
7	1		1		2
9			2	1	3
10		1			1
16				1	1
Total	146	628	802	656	2,232
Average number of authors	1.21	1.24	1.37	1.72	1.42

An increasing trend was also found regarding the number of journal articles published per academic. Results in Figure 4 indicate that over the years Australian LIS academics have become more productive. In 2008 the average number of publications per academic nearly quadrupled since 1967. While this growth appears impressive, over all publications per academic remains low. Only in 1999 and in 2007 did the average productivity per academic exceed one publication per year. For all other years academics published on average less than one journal article per year. However, the distribution of journal articles among authors is highly skewed; 118 of the 382 longer-serving Australian LIS academics had not published any journal articles in journals indexed by the eight selected databases. The 14 most productive academics authored (or co-authored) over a quarter (634 of 2,232) of all the journal articles. A detailed analysis of the productivity of these 14 Australian LIS academics is provided by Wilson et al. (*in press*).



*Figure 4: Average number of journal articles per LIS academic per year, and the trend line: 1967-2008.*

A final characteristic of publication patterns over time is the approximate length of an average article in a given year. As Figure 5 indicates, publications have become longer over time. One reason for this may be the increasing academization of Australian LIS academics who began as practitioners/educators (Wilson et al. 2010). Papers may have shifted from shorter reports on more practical issues, for instance on library automation or education, towards longer and theoretically oriented research papers. This raises the question: can such speculations be grounded in firmer analysis of the actual subject areas? An initial attempt to engage in such an analysis is provided in the following section.



*Figure 5: Average length (in pages) of journal articles published by Australian LIS academics per year and the trend line, 1967-2008.*

### ***Subjects addressed over time***

One attempt to gain some understanding on how topics change over time is to look at the words used in titles of journal articles. A rough indicator can then be provided by looking at aggregates of words in titles for year-ranges. Such an analysis is provided in Figures 6 to 9 for publications from four different time periods spanning 1967-2008. The larger a keyword, the more frequently it appeared in the titles. Proximity of keywords has no particular importance. Some observations can be made across all four time periods: the most obvious is an increased of the term 'information' in titles, while at the same time the word 'library' appeared less frequently. This is not surprising as over the four time periods, there has been a clear move from 'library' to 'information' (or the combination of both as in LIS), perhaps indicating a move from 'library science' towards the 'information science' of 'library and information science'. This move is also reflected in the changing name of databases. Before 2000 LLIS was simply called *Library Literature*. Nevertheless, it is interesting that this change is also reflected in titles of journal articles by Australian LIS academics.

Some further changes are visible over the four time periods. For example, while 'education' seems to be a topic with consistent appearances in each period, the keyword 'school' appears less frequently over time. Also, over all four time periods, there is an increase in the number of times the keyword 'research' appears. This would suggest that LIS in Australia has moved from a more vocation-based discipline driven by practitioners in the early years to a more research-oriented discipline adapting to the university environment (Wilson et al. 2010).

In addition to a general shift in orientation from 'library' to 'information' and the increasing use of 'research', at different points in time are also reflected in the



Figure 6: Visualization of the frequency of keywords in titles of journal articles authored or co-authored by Australian LIS academics from 1967-1979; the larger the word, the more frequent the usage.





Figure 9: Visualization of the frequency of keywords in titles of journal articles authored or co-authored by Australian LIS academics from 2000-2008; the larger the word, the more frequent the usage.

Australians, and literature of particular importance to Australia (see Table 2). Other terms that started to appear in the 1980s frequently are related to 'management' (manage, management, manager, managers, managing).

The importance of management-related terms continues to rise in the 1990s (Figure 8). But also other emerging fields of interest, mostly related to particular technologies, enter the scene: most obviously the term 'internet', but also 'cd', 'rom' and 'electronic'. At the same time as technology-related papers are on the rise, library-related papers decline. While catalogue-related terms (catalogue, cataloguers, catalogues, cataloguing) were among commonly used words in earlier decades they no longer feature from the 1990s onwards.

In the 2000s (Figure 9) 'technology' as a central aspect of journal publications did not increase further. At least the term 'technology' featured less frequently than in the 1990s. While terms such as 'Web', 'online', and 'search', 'searching' or 'seeking' started to appear, the focus may not be on the technology as such but on its use. This is also indicated by an increase of use-oriented terms and the appearance of the term 'user'. An increasing interest in users is also indicated by the fact that terms such as 'community' and 'collaborative' appeared more frequently in titles. However, most obvious is an increase in the term 'knowledge'. And finally the appearance of the term 'literacy', most likely used as a part of the phrase 'information literacy' indicates an increasing interest in this issue since 2000.

An analysis of frequently used words in titles indicates over all a broadening of areas of interests over the last 40 years. While in early years library-oriented activities such as cataloging and classification featured frequently; interest seems to have shifted over the years from particular technologies towards knowledge, users, and management.



## Conclusion

This article used an extensive list of academics working in Australian LIS institutions for more than two years since 1959 to examine their publications. In total 2,232 unique journal articles were found for those academics in eight different databases. This enabled the investigation of the coverage of Australian LIS literature in different databases, the journals academics published in, changing publication patterns over time, as well as changes in terms used in the titles of publications.

Results indicate that databases vary in their coverage of materials. While the greatest number of journal articles was found through searching LISA, book reviews featured heavily in LLIS; and AEI+ provided the most comprehensive coverage of conference material, books, and book chapters. Some of LISA's advantage in the coverage of journal articles stems from the fact that it is the only database providing substantial coverage of literature published prior to 1980. Nevertheless, coverage of more recent articles published since 2000 is more comprehensive in LISTA. Most importantly, however, almost half of all journal articles could only be found in one database, thus underlining the importance of searching multiple databases, and the need for libraries to subscribe to multiple databases in the same subject area. Notably the small number of publications by Australian LIS academics in the *Web of Science* (SCI, SSCI, and AHCI) is sobering. In future research, it would be interesting to see if *Scopus* provides better coverage of publications by Australian LIS academics than WoS.

The results presented in this article also indicate that LIS academics in Australia produced an annual total output of 70 to 80 publications in the 1980s and 1990s. Since then publication output has declined. However, as the number of academics working in the field also decreased since the late 1990s, the average number of publications produced per academic per year has increased. Similarly the number of academics collaborating on articles increased over time as well the average length of articles.

The highly skewed distribution of articles over journals was observed. Journal articles appeared in nearly 500 different journals. However, one-quarter appeared in only five journals and more than one-half appeared in only 16 journals, all of which were published in Australia. This underlines the importance of national journals for Australian LIS. However, there seems to be an increasing trend for publications to appear in international journals.

Finally, analysis of the frequency of words appearing in the titles of publications shows a clear shift from library-related topics towards information-related areas. This indicates the adoption of information science (or studies) in the

Australian LIS scene. Also featuring in this shift are other terms such as related to literacy, the community, collaboration, Web, and searching.

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