Australian Academic & Research Libraries

Volume 41 Number 4 December 2010

Australian Library and Information Association
ISSN 0004–8623

Australian Academic & Research Libraries
Volume 41 Number 4 December 2010

Contents

Editorial

As you have probably noticed, there has been some delay in the publishing of this issue. I apologise for this and hope that future issues will be out in a timely fashion. This emphasises the issue of the time taken in actually putting the issue together - from receiving or soliciting articles, going through the refereeing process (which can be an iterative process between the author and editor), and final publication. This all takes time and I would encourage potential contributors to consider this when preparing and offering material for publication.

As with every issue, this copy of AARL contains a mix of articles that will hopefully provide interesting and thought provoking reading. Opening with a joint paper from an academic and practitioner – something I am keen to encourage – looking at the critical issue of student retention and the role of the library. Universities everywhere worry about student retention and what can be done to reduce drop-outs in that vital first year and if the library can be proven to help in this area then this provides valuable ammunition in strengthening its role on campus. This is an area calling for further research and investigation. Following this is a wide-ranging paper from two US consultants in the field of institutional repositories. They draw on their experience to provide a challenging perspective on the role of the repository and how to ensure its success and recognition. Their ideas and the results of their research provide some valuable insights that are as applicable here as they are in the US. The third article is from a relatively new entrant to the profession, Katherine Howard, who, as part of a Masters thesis, conducted research into the ways in which LIS education equipped new graduates for working in the digital library environment. This is a subset of her Masters thesis and for educators in particular, provides some useful feedback, relevant to their subject and course design.

Finally, the first report from a major review of health libraries and librarianship, funded by ALIA, closes this issue. Again, its outcomes are highly relevant to educators with course design and professional development noted as key areas. Additional reports from this review will appear in the LIS literature over the coming year.

Hoepfully you'll be aware of the ALIA Research Day being held at the State Library of New South Wales the day after online – Friday February 4th. While it is aimed primarily at practitioners or those new to research in our field I would encourage anyone to attend. As we have noted before, good research is crucial to the future of the profession and you can get a kick-start by attending this day! I look forward to seeing you there.

Bob Pymm
Editor

LOANS, LOGINS, AND LASTING THE COURSE: ACADEMIC LIBRARY USE AND STUDENT RETENTION

Gaby Haddow and Jayanthi Joseph

Activities and services that improve student engagement and retention in the higher education sector are important not only to individual students' success but also to university planning and funding. This paper reports on a study carried out to explore whether use of the library by new university students is associated with continued enrolment. Limited to commencing students in March 2010 at Curtin University, the study drew on demographic data from the university's enrolment system and instances of library use from the library's management system. Results of the statistical analyses indicate that library use is associated with retention, and, importantly, that library use in the early weeks of a student's first semester is associated with retention. Findings from this study suggest that academic libraries can contribute to the retention of students by offering carefully targeted programs and services.

Gaby Haddow, Department of Information Studies, Curtin University, Perth 6845.
Email: G.Haddow@curtin.edu.au

Jayanthi Joseph, University Library, Curtin University, Perth 6845.
Email: J.Joseph@curtin.edu.au

INTRODUCTION

Engagement and retention of students is becoming increasingly important in the competitive higher education environment and findings from the 2008 Australasian Survey of Student Engagement (AUSSE) report suggest that library use is a factor in improving student engagement (ACER, 2009). With data drawn from self-reported library use, including 'using library resources on campus or online', the AUSSE Enhancement Guide for librarians and libraries notes:

"There's very strong evidence to suggest that students tend to be more engaged with learning … if they engage with library resources, interact with library staff, and spend time using libraries" (ACER, 2009). This project focused on one of these factors - engaging with library resources. The specific aims of the study were: to explore if an association between library use and student retention is evident, and to investigate whether socio-economic status (SES) and age at entry are influencing factors in library use and retention.

BACKGROUND

Using the language of the time, studies dating back to the early 1970s sought to develop an understanding of 'dropouts' from higher education. Subsequently, the terms attrition, student involvement, student success, retention, persistence, and engagement have been employed to describe "the enrolment patterns of students at specific points within postsecondary institutions" (Paul Hamlyn, 2010). In recent years, in Australia and the United Kingdom at least, the preferred terminology has been engagement and retention; engagement referring to "students' involvement in activities and conditions that empirical research has linked with high-quality learning and development" (ACER, 2009) and retention relating to students continuing and completing their studies. Kuh et al. are quoted as saying "what students do" in post-secondary education institutions "counts more for what they learn and whether they will persist" than their background or institutional factors (Paul Hamlyn, 2010). Engagement, therefore, is regarded as critical to retention.

Clearly, libraries in higher education institutions have a role to play in student engagement and retention. This is acknowledged in the model developed by the 'What works? Student Retention and Success' program, an initiative supported by the Paul Hamlyn Foundation and Higher Education Funding Council for England (Paul Hamlyn, 2010). In the model, 'student engagement and belonging' is at the centre of a wheel with spokes reaching out to different institutional systems. One of these systems is 'professional service provision' in which library and learning services reside. The Australian Council for Educational Research (ACER) has specifically addressed the role of libraries and librarians in their AUSSE Enhancement Guide. A graph in the Guide plots self-reported library use against ten outcome measures, indicating that all except one (departure intention) of these measures improves with an increase in the frequency of using library resources.

Improving student engagement and retention from a library perspective is the focus of a number of papers looking at different aspects of library services. The provision of library instruction or information literacy programs has been identified as an important contributor to student engagement, (Boruff-Jones & Mark, 2003; Gibson, 2006; Gonyea & Kuh, 2003; Gratch-Lindauer, 2007; Selegean, Thomas & Richman, 1983 and Stamatoplos, 2009) with particular attention paid to minority students in some cases (Holmes & Lichtenstein, 1998). Specifically relevant to the research described in this paper is a study, primarily focusing on the role of information literacy as a catalyst, that found that the use of

electronic information systems was associated with student retention (Crawford & Irving, 2005). Other studies have employed quantitative analyses to show that there is a strong association between library expenditure and student retention (Bell, 2008; Mezick, 2007), and the role of student employment in academic libraries is also discussed (Wilder, 1990).

Research into the use of and preferences for a library's physical space in relation to student engagement is the focus of several papers (Bennett, 2007; Salinero & Beardsley, 2009; Suarez, 2007; Webb, Schaller & Hunley, 2008), with perceptions of library space by students of different races explored to identify influencing factors (Elteto, Jackson & Lim, 2008). The provision of targeted library programs to improve retention of minority students (Love, 2009) and the contribution of library services to student retention, more generally, are also examined in the literature (Foster, 2003).

The focus on 'minority' students' engagement and retention relates to US findings that indicate "universities fail to retain African-American, Hispanic, and Native-American students at the same rate as White students" (Love, 2009) and these results have relevance to this research. In response to the Bradley Review, the Commonwealth Government has announced the intention to provide additional funding to higher education and research to "improve access and outcomes for students from low socio economic backgrounds" (DEEWR, 2008). The additional funding is closely linked to helping universities to "provide intensive support to disadvantaged students and improve retention and completion rates" (Australian Government, nd). As a result of this initiative, universities will be looking at ways to develop an environment in which students from low socio-economic status (SES) backgrounds have an increased opportunity to engage with the institution and complete their studies.

At present SES is determined by the postcode for the area in which a student resides (ABS, 2008). Postcodes are ranked in the Socio-Economic Indexes for Areas (SEIFA) using data collected by the Australian Bureau of Statistics census. It has been acknowledged that this method of classifying SES is flawed and a Discussion Paper was released in 2009 inviting comment on the current mechanism for defining low SES and proposals for alternative measures (DEEWR, 2009). However, as new measures are yet to be decided or developed, this study used the existing system.

METHODS

In order to achieve the study's aims, enrolment, demographic, and library use data were required for students enrolled in Semester 1 2010 at Curtin University. Enrolment and demographic information relating to commencing students was provided by the University's student database and this was used to identify retained and withdrawn students at the end of Semester 1. Two spreadsheets were generated from the student database. The first listed all new students enrolled at 31 March and the second listed new students enrolled at 26 June 2010. Also included in the spreadsheets were: student ID numbers, postcode, permanent country address, and mature age data. Using the unique student ID

numbers, retained students (those listed in both spreadsheets) and withdrawn students (those listed in the first spreadsheet only) were identified.

The library's management system provided library use data for the commencing students at three points in the semester – 1 April, 15 May and 26 June. Library use data collected for each commencing student were:

- Number of items borrowed (loans).
- Number of logins to a Library workstation (PC logins).
- Number of logins to the catalogue, databases, metasearch tool, and eReserve (Other logins).

Instances of PC logins indicate that students have entered the library and used a workstation. There is no way of determining if the login was for study or other purposes. Other logins indicate that students have used library resources and this may be while logged in to a library workstation or from an external location.

The data generated for library use were extracted as numeric values (for example, 0, 12, 42 instances of PC logins), and this measure of use was included in some analyses. A second measure of the 'extent' of library use was developed from the numeric values which were coded into several categories. Somewhat arbitrary, but based on the belief that in a 14 week semester one instance per fortnight for each type of library use is low, the categories for extent of use at 26 June were coded as:

- no use – zero instances of use
- low use - between 1 and 7 instances of use,
- medium use - between 8 and 14 instances of use, and
- high use - 15 or more instances of use.

Extent of library use was also coded for the first point at which data was collected, 1 April. Based on the same view (that is, one instance of library use each fortnight is low) the extent of library use at 1 April was coded as:

- no use – zero instances of use
- low use - 1 or 2 instances of use,
- medium use - between 3 and 8 instances of use, and
- high use - 9 or more instances of use.

Ethics approval to conduct the study was sought from and granted by nominees of the Curtin University Human Research Ethics Committee. The ethical considerations requiring particular attention were to ensure individual students were not identified or identifiable and the secure storage of data.

The sample

At the beginning of Semester 1 2010 there were 8,526 new students enrolled in at least one unit. Using the student database spreadsheet of 31 March, Western Australian postcodes were coded as high, medium and low SES using the 2006 SEIFA index. The Index calculates SES on both national and state comparisons. In this study, national SES classes were used for the coding. A number of postcodes had not been assigned an SES level in the Index (for example, post office box postcodes) and these were coded as 'no data' and excluded from the sample. Due to the types of library use being investigated, the sample for analysis also excluded students who lived outside the Perth metropolitan area as they had little or no opportunity to visit the campus and login to the library workstations (PC logins). Students with a permanent country address outside of Australia were not included in the sample because the SES class assigned to their Australian address would not necessarily reflect their true socioeconomic background. Mature aged status is assigned to students who are aged 21 years or older at entry to university.

After excluding students with no SES data, those with a permanent address outside Australia, and those living outside the Perth metropolitan area, the original population of commencing students was reduced to a sample of 4661 for analysis. Of this sample, 194 (4.2%) students had fully withdrawn from their studies. Table 1 displays the percentage of the sample by SES background and by age.

Table 1: Percentage of sample by socioeconomic status and age

SES	%	Age	%
Low	8.6	Under 21 years	65.9
Medium	48.9	Mature age	34.1
High	42.5		

The statistical software program SPSS was used to carry out quantitative analyses of the data. In most cases descriptive statistics, such as frequencies and cross tabulations, were used to calculate the extent of library use and retention, SES background, and age. The non-parametric test (the Mann-Whitney test) was run to determine associations between the numeric values for library use and the other factors.

RESULTS

Regardless of whether students had continued in their studies or withdrawn during the semester, a large proportion (64.6%) had not borrowed items from the library over the entire period. The results for library use, as indicated by library workstation logins and logins to other library resources requiring authentication, by the whole sample showed much higher levels of use over the course of the semester (74.6% and 83.7% respectively). Figure 1 below displays the results for

library use by the whole sample, with the different types of use measured by at least one instance of use.

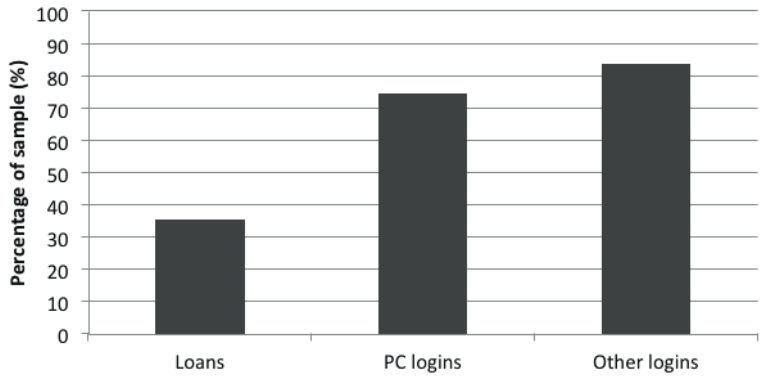


Figure 1: At least one instance of library use by all students

When the three types of library use are analysed against retention at around the middle of semester (15 May) and the end of the semester (26 June), all are statistically significantly associated with retention. That is, retained students showed higher levels of loans, PC logins, and other logins. These are not surprising findings as withdrawn students will no longer have access to the resources of the university library and may have withdrawn several weeks before the data were collected. However, the measures of library use earlier in the semester produced interesting findings. The results indicated no significant differences between the number of loans by retained and withdrawn students, but the other types of library use (PC logins and other logins) were statistically significantly different ($p=.002$ and $p<.001$) between the retained student group and the withdrawn group at 1 April. In Figure 2 below these results are presented as extent of library use.

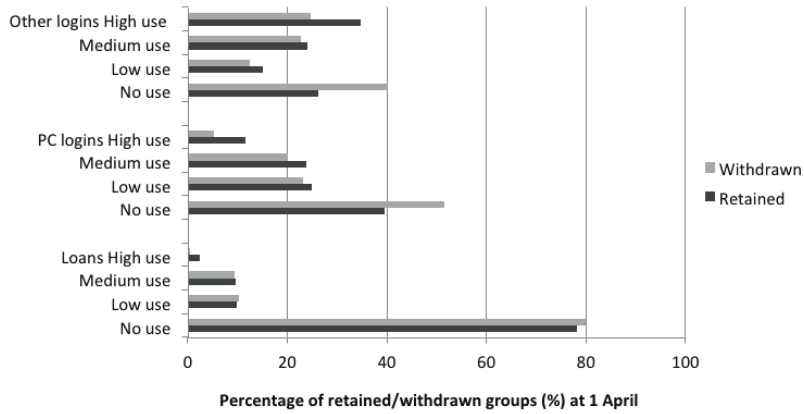


Figure 2: Extent of library use by retention or withdrawal at 1 April

The analyses for different SES backgrounds and library use (across the whole semester) in relation to loans and other logins do not vary significantly between the SES groups. Significant differences were found for students logging in to library workstations from the low SES group. These students logged into the library workstations at higher than expected rates and show a significant variation for medium and high use. A similar finding was seen for medium SES students who had more cases of high PC logins than expected. In contrast, there were a higher than expected number of students from the high SES group that have no or low use of library workstations. The difference between the SES groups and PC logins was statistically significant (p=.006) when the analyses were conducted for use at 1 April. Figure 3 illustrates the extent of the three types of library use by the different SES groups over the semester.

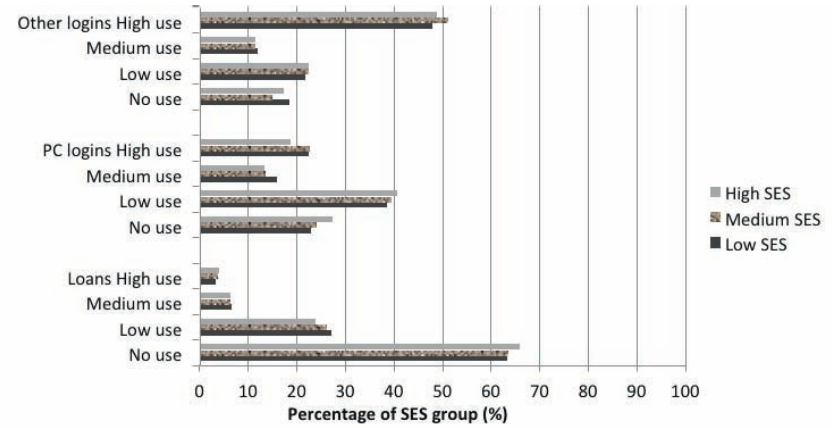


Figure 3: Extent of library use by SES background

Statistically significant differences were found between the library use (for the whole semester) of mature age students and those under 21 years. That is, mature age students borrow books at higher rates than the younger students. This finding was also seen in the analyses for library use in the early weeks of the semester. There are significant differences between mature age students and under 21 year olds for loans (p<.001) at 1 April, and statistically significant differences for PC logins (lower than younger students, p<.001) and other logins (also lower than the younger students, p=.001). Figure 4 displays the results for extent of library use by mature aged and non-mature aged students for the whole semester.

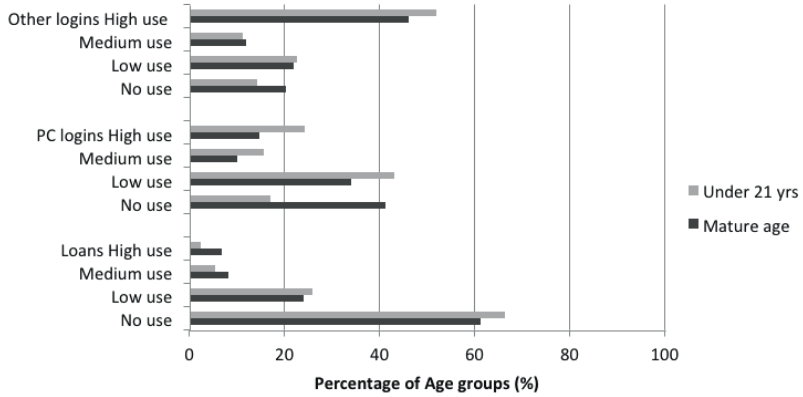


Figure 4: Extent of library use by age

DISCUSSION

One of the most surprising findings from this study is that many new students to Curtin University are not using the library, at least not in the traditional sense. Just under two-thirds of the sample of 4,661 students had not borrowed a physical item, such as a book or a DVD, over the semester period. No comparable data was available to determine whether this is a trend which has been occurring over some time or a phenomenon related to this particular group of students. However, as library resources are increasingly being made available electronically, it is probably reasonable to conclude that low loan rates are a casualty of these developments. In contrast, nearly 75% of the new student cohort had logged into the library workstations and over 80% had accessed electronic resources through the library website. Given the age of most commencing students, these results are not unexpected and they support previous research findings relating to this generation's use of technology (Gardner & Eng, 2005). Considered together, the findings for use of the library workstations compared with loans provides evidence with which academic library managers can plan for space priorities. With this evidence it may be decided that housing large physical collections will have to make way for additional workstations in the library.

While, logically, student retention was associated with higher levels of library use over the semester, the significant differences found for use of library workstations and other electronic resources and retention early in the semester may be the most useful results to emerge from the study. It is debatable whether a conclusion can be reached that library use of this type equates to student engagement at university. However, it does appear there is an association between these types of library use and a student remaining enrolled and this has implications for the planning of orientation and information literacy activities. It is also encouraging to find that the relationship between engagement and library use found in the self-reported data from the AUSSE report is supported by the quantitative data and statistically significant findings of this study.

A possible explanation for the higher than expected rates of the library workstation logins by students from low SES backgrounds is that these students may have less

access to information technology in their homes. Overall, the differences in library use between the SES groups were not statistically significant over the semester; however, PC logins at 1 April were significantly higher for students from low SES backgrounds than their colleagues from medium and high SES backgrounds. Low or no use of the library workstations by the medium and high SES groups in the early weeks of the semester was also notably higher than for the low SES group. Generally, the findings show that over the course of a semester library use by students from different socioeconomic backgrounds levels out, although there may be some opportunity, early in a semester, for academic libraries to ensure students are aware of the resources, both physical and electronic, available.

Mature aged students display different library use patterns than their younger peers; they have higher levels of loans, but do not use the library workstations and other electronic resources requiring authentication at the same levels as the students under 21 years. The higher reliance on physical items by mature aged students may be related to less awareness of electronic resources or to a lack of confidence using these technologies. It would be interesting to follow the mature age students through their studies to see if their library use patterns change. In the shorter term, the findings point to a need for targeted information literacy training for mature aged students in the first semester of their university enrolment.

Two additional analyses were conducted to explore if SES background and age were related to retention. These did not include library use as a factor and are therefore not directly relevant to the study. Supporting the findings of previous research, socioeconomic background was not a significant factor in retention in this sample. Mature aged students, however, withdrew from their studies at higher rates than the younger students.

CONCLUSION

This study was conceived as a pilot project which would test the methods being applied and identify aspects of library use and student retention to explore in the future. As such, it was limited to only three types of library use and two demographic factors relating to the commencing student sample. The results suggest that there is potential for a larger and longer term quantitative study which could investigate additional demographic characteristics of students (much of this data is readily available in student records systems) and alternative measures of library use to contribute to our understanding of the role of academic libraries in student retention. Further research of this kind may enable library managers to plan, develop and implement programs to meet the challenges of student engagement and retention, and thereby contribute to their institution's success in the higher education sector in the future.

Although limited in its scope, the study has produced a number of interesting findings which have implications for academic library practice. On the basis of the findings, it may be necessary for academic libraries to provide additional workstations, which are heavily used generally and appear to be particularly important to students from low socioeconomic backgrounds. Targeted information

literacy training for mature aged students in the early weeks of the semester may improve their use of the physical and virtual electronic resources available to them in the library. However, the results showed a high proportion of withdrawn students with no or low use of library workstations and other resources early in the semester, which suggests that training of this kind may be useful for all commencing students. The findings for the low number of loans have longer term implications and these would be understood better if loan numbers were tracked over several years.

The importance of academic libraries in providing support and core services to university students is generally recognised and appreciated by the institutions in which they operate. However, as the institutions come under increasing pressure by government to retain students, and more specifically to retain students from previously underrepresented groups in the community, it is crucial to gain an understanding of how the academic library can contribute. This study has presented findings that indicate ways in which this may be achieved, at least in part, and suggests a number of research opportunities to pursue in the future.

REFERENCES

Australian Bureau of Statistics (ABS). 2008. *SEIFA: Socio-Economic indexes for areas*. http://www.abs.gov.au/websitedbs/D3310114.nsf/home/Seifa_entry_page.

Australian Council for Educational Research (ACER). 2009. *Engaging students for success: Australasian student engagement report, Australasian survey of student engagement* 2009. http://ausse.acer.edu.au/

Australian Council for Educational Research. nd. *How libraries and librarians can support student engagement*. http://ausse.acer.edu.au/images/docs/AUSSE_EG_Librarians.pdf.

Australian Government. Nd. *Funding to support low SES participation targets*. http://www.deewr.gov.au/HigherEducation/Documents/PDF/Pages%20from%20A09-303%20Budget%20Fact%20Sheets-2_webaw.pdf

Bell, S. 2008. Keeping them enrolled: How academic libraries contribute to student retention. *Library Issues: Briefing for Faculty and Administrators*. 29(1): 1-4.

Bennett, S. 2007. First questions for designing higher education learning spaces. *Journal of Academic Librarianship* 33(1): 14-26.

Boruff-Jones, P. D. & A. E. Mark. 2003. Information literacy and student engagement: What the national survey of student engagement reveals about your campus. *College and Research Libraries*. 64(6): 480-493.

Crawford, J. & C. Irving. 2005. The research agenda. *Library + Information Update*. 4(1-2): 48-49.

Department of Education, Employment and Workplace Relations (DEEWR). 2008. *Review of Australian higher education: Final report*. http://www.deewr.gov.au/HigherEducation/Review/Pages/default.aspx

Department of Education, Employment and Workplace Relations (DEEWR). 2009. *Measuring the socio-economic status of higher education students: Discussion paper*. http://www.deewr.gov.au/HigherEducation/Pages/MeasuringSESStatusofStudents.aspx

Elteto, S., Jackson, R. M. & A. Lim. 2008. Is the library a "Welcoming Space"? An urban academic library and diverse student experiences. *Portal: Libraries and the Academy*. 8(3): 325-337.

Foster, K. 2003. Libraries and student retention: Some thoughts about the issues and an approach to evaluation. *SCONUL Newsletter*. 28: 12-16.

Gardner, S. & S. Eng. 2005. What students want: Generation Y and the changing function of the academic library. *Portal: Libraries and the Academy*. 5(3): 405-420.

Gibson, C. (ed). 2006. *Student engagement and information literacy*. Chicago, IL: Association of Research Libraries.

Gonyea, R. M. & G. D. Kuh. 2003. The role of the academic library in promoting student engagement in learning. *College and Research Libraries*. 64(4): 256-282.

Gratch-Lindauer, B. 2007. Information literacy-related student behaviors: results from the NSSE items. *College and Research Libraries News*. 68(7): 432-436.

Holmes, B. & A. Lichtenstein. 1998. Minority student success. *College and Research Libraries News*. 59(7): 496-498.

Love, E. 2009. A simple step: Integrating library reference and instruction into previously established academic programs for minority students. *Reference Librarian* 50(1): 4-13.

Mezick, E.M. 2007. Return on investment: Libraries and student retention. *Journal of Academic Librarianship*. 33(5): 561-566.

Paul Hamlyn Foundation & Higher Education Funding Council for England. 2010. *Retention grants programme*: *Briefing No. 3*. http://www.actiononaccess.org/index.php?p=11_3_1

Salinero, D. & C. Beardsley. 2009. Enhancing the academic experience: The library and campus engagement. *College and Research Libraries News*. 70(3): 150-152.

Selegean, J.C., Thomas M. L. & M. L. Richman. 1983. Long-range effectiveness of library use instruction. *College and Research Libraries*. 44(6): 476-480.

Stamatoplos, A. 2009. The role of academic libraries in mentored undergraduate research: A model of engagement in the academic community. *College and Research Libraries*. 70(3): 235-249.

Suarez, D. 2007. What students do when they study in the library: Using ethnographic methods to observe student behavior. E-JASL: *The Electronic Journal of Academic and Special Librarianship*. 8(3): np.

Webb, K. M., Schaller, M. A. & S. A. Hunley. 2008. Measuring library space use and preferences: Charting a path toward increased engagement. *Portal: Libraries and the Academy*. 8(4): 407-422.

Wilder, S. 1990. Library jobs and student retention. *College and Research Libraries News*.51(11): 1035-1038.

REPOSITORY COLLECTION POLICIES: IS A LIBERAL AND INCLUSIVE POLICY HELPFUL OR HARMFUL?

Jean-Gabriel Bankier and Courtney Smith

Institutional repositories have been established by most university libraries but their level of success has varied. Determining what belongs in such repositories has been the subject of some discussion but research would suggest that a broader rather than narrower compass is a positive approach to adopt. By seeking out a variety of content types, the library is able to initiate, renew, or redefine its relationship with faculty, departments, and administration, generating critical support for scholarly communication and repository initiatives. This paper provides examples of successful IRs and their scope.

Jean-Gabriel Bankier, CEO Berkeley Electronic Press.
Email: jgbankier@bepress.com

Courtney Smith, Outreach and Scholarly Communications, Berkeley Electronic Press.
Email: csmith@bepress.com

What belongs in an institutional repository (IR)? For some, the answer is still "only faculty refereed journal articles." In these cases, there is sometimes a consideration of including working papers, but the scope of content accepted in the IR – the scope of its collection policy, specifically – remains limited to what can be termed the "faculty post-print approach."

IRs, after all, have been driven by the singular and noble goal: to address the scholarly communications crisis. In response to rocketing serials prices in the 1990s, and spurred by the emerging technology of digital publication, libraries began to explore the institutional repository as a tool to both remove barriers to access and ensure permanent access to the intellectual output of the institution.

Throughout most of the last decade, the solution to the crisis was to seek out faculty articles and post these to the institutional repository. This post-print approach has resulted in limited faculty engagement, largely because the message brought to faculty failed to frame the strengths and purpose of the IR in terms that resonated with faculty concerns. In the early years, the library framed the repository in terms of "access" and "crisis," which did not resonate with faculty. Access and the rising cost of journal subscriptions were simply not fundamental concerns for most academics (Davis & Connolly, 2007).

Many still approach collection policies in this way – with target content limited to faculty refereed journal articles – despite the fact that throughout the first decade of the 21st century, IRs approached in this way remained largely unused, suffered from a lack of faculty engagement, and came to be perceived as failures. The singular focus on post-prints was ultimately a failure on the part of the library and the community to recognise and articulate the strengths of the IR in terms that resonated with faculty. Salo (2008) called this a lack of user-centred understanding.

One proposed solution to the lack of faculty engagement is to seek a mandate (Harnad 2009, Sale 2007). A mandate can be a useful tool in developing a portion of a repository collection. It has been found that while mandates can be useful "encouragement", a library must still marshal its marketing and outreach resources to successfully engage participants (Cochrane & Callan, 2007).

Institutional repositories in the UK and Australia have also come to be seen as a tool for senior administration to fulfill government reporting needs. Thomas and MacDonald (2008) speak of the "administrative utility" of the repository when employed as a reporting tool. In Australia in particular, the reporting needs demanded by ERA (Excellence in Research for Australia) have been a major driver for universities to mandate the deposit of research material into repositories. For ERA, having access to material via an institution's repository facilitates auditing, rating, and related processes seen as critical in ensuring the validity of ERA's evaluation of the research being undertaken.

However, it could be claimed that this recent focus on the reporting needs of ERA is a distraction to the overall open access mission of the repository. Utilising the repository as a reporting tool may make it relevant to senior administration, but, outside the mandatory lodgment processes, it does little to solve the lack of engagement from faculty, and sometimes runs the risk of reducing the open access vehicle to a citation management tool.

This paper surveys a set of institutional repositories at higher education institutions primarily within the US to better understand strategies for engaging faculty and developing senior administrative support in environments without mandates and untied to government reporting. Most higher education institutions in the United States operate institutional repositories without mandates – as do the repositories surveyed here – and as such have developed other strategies to engage faculty and campus constituents. Despite the slightly different context, it is felt that these findings reported from the US provide relevant and useful information to those managing repositories in Australia and elsewhere.

THE RANGE OF CONTENT

Over time, it has been demonstrated that where repositories are able to articulate advantages and benefits in a way that resonates with faculty and campus concerns, greater deposit and general support is reported. This often means widening the scope of the collection policy to make the repository available to an array of publishing and archiving needs (Basefsky, 2009).

So, what now belongs in an IR? The authors would argue that almost anything in need of better access and exposure belongs. This type of inclusive policy opens up new opportunities for the library to articulate and demonstrate the value of the repository to a variety of stakeholders across campus.

Of course, many have argued that an inclusive policy – one that accepts student, administrative, or other non-faculty work – will only turn faculty away from repository participation. However, the research has shown this to be untrue, as evidenced by the exemplary repository at University of Nebraska – Lincoln (Howard, 2010). There appears to be little or no conclusive literature showing that faculty are dissuaded from participating in the IR simply because the repository might also publish less scholarly faculty endeavours or content from other groups on campus.

This paper examines how a new and advancing perspective on repository collection policies – one of inclusion rather than exclusion – is in fact both helping the library achieve its original goal (open access to faculty articles) and generating crucial support through new and renewed relationships on campus.

The range of content that is being put into repositories is surprising. After all, nearly any discrete file can be posted. This content is sometimes scholarly, and sometimes historical, but Digital Commons subscribers often look well beyond that. In some of the most successful cases, anything that would benefit from greater exposure gets consideration. There are all sorts of individuals and groups on campus looking for greater exposure to their work and grateful to the library for providing such an outlet. The policy decision is only whether serving this unmet need is helpful or harmful to the repository and its mission.

It is proposed that libraries across the Digital Commons community open their repository collection policies to an array of work, including: student work, technical reports, image collections, public relations documents, speeches, and professional work done by faculty outside their employment or scholarly undertakings at the university. This strategy of seeking out a wide variety of work for inclusion in the repository helps to bring in more collections, whether faculty-originated or from elsewhere. Moreover, by seeking out a variety of content types, the library is able to initiate, renew, or redefine its relationship with faculty, departments, and administration, generating critical support for scholarly communication and repository initiatives, and helping the library find success by supporting the mission and business of the university and impacting scholarly life on campus (Bankier & Smith, 2010).

To shed some light on what is being added to repositories, the research reported here focused on the subscriber base. This was reviewed, grouped, and then mapped to create a continuum of content. Next, the content was cross-charted with its source, - the author of the content. The axes in the chart below are based on the following criteria:

1. Scholarly nature: position of content type guided by the degree of vetting and quality of review and
2. Source of scholarship: determined by the relation of the content's author to the institution.

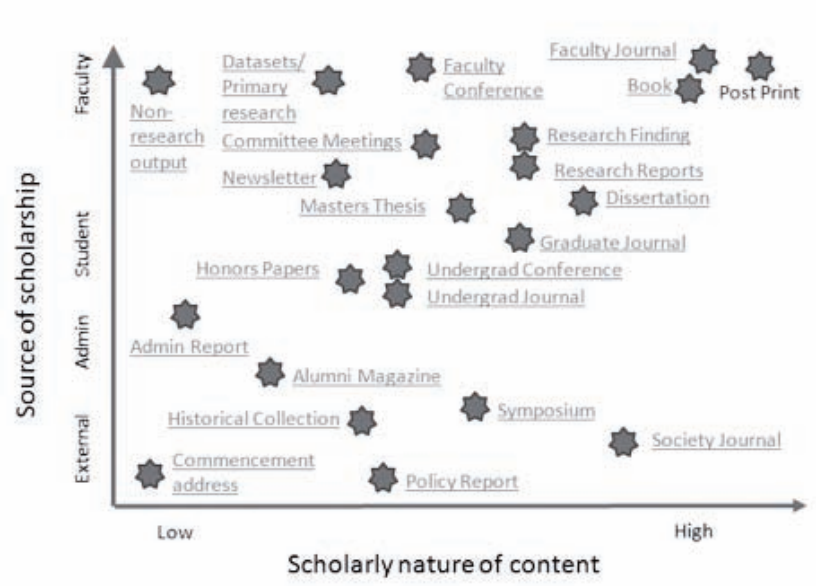


Chart: The continuum of content in repository collections

THE CONTINUUM OF CONTENT IN REPOSITORY COLLECTIONS

The x-axis in the above chart represents the scholarly nature of content. The determination is based primarily upon the nature and level of the review process, and level of the reviewer. Faculty peer reviewed and traditional commercially published for profit content lies at the high end, new library published faculty journals just left of that. Student content was ranked relatively high if it was faculty or student reviewed as well – giving more weight to those works written by graduate students and faculty reviewed, with slightly less given to undergraduate content that is faculty or peer reviewed. Faculty produced technical and research reports figure on the higher side of mid-spectrum. We might consider these peer approved, but not formally reviewed, or otherwise approved by nature of the faculty member's affiliation with a certain department, centre, or the institution itself. Finally, at the "low" side of the scholarly nature continuum are works produced by faculty, students, or unaffiliated authors in the course of an

appointment, request, etc. For example, congressional testimony by law faculty is captured in many law repositories – this is categorised as faculty-produced but of "low" scholarly nature. Also, speeches, lectures, and other content also figure on the "low" half – these are often produced during the course of an appointment or invitation by an individual or group and are not reviewed prior to their production.

The types of content captured on the left half of the graph are generally unreviewed and are often seen as part of the "historical record" of the institution. For repositories that do not consider the "historical record" as part of their scope, this content is generally not captured. As we move to the right side of the graph, we find that the content becomes more a part of the "intellectual" or "scholarly" output of the institution. This type of content is generally beginning to be captured by all IRs in the Digital Commons community, from those at major research institutions (including universities) to small governmental and private organisations.

Looking at the lower half of the graph (following the y-axis), shows content that is generally seen as "supporting the business" of the university, a topic addressed in greater detail in an earlier paper, Digital Repositories at a Crossroads. This is predominantly the content in the bottom left quadrant, which functions most often as content disseminated to increase the visibility and prominence of works at the institution, and to aid in fundraising. Of course, the society journal fits this "business" rubric, if a little more tenuously. A library-society partnership for publishing a journal does bear certain relevance to a business relationship between library and society, and can serve to increase the prestige of a library publishing program.

EXAMINING THE CONTINUUM OF CONTENT BY SOURCE

External content

Some repositories within the Digital Commons community house works produced by external parties or in external environments. That means a repository policy that allows for the inclusion of work by authors not employed by or attending the institution. For the purposes of this research, this type of content is labeled "external content," recognising that it is shorthand for "content produced by external parties."

The majority of the works produced by external parties are captured in the IR because they were produced on campus or under campus sponsorship – lectures, speeches, symposia, and commencement addresses are some examples. These types of work are often instrumental in forming business relationships with parties on campus, and as part of the library's role in supporting the "business" of the university. Often, this work is archived as part of the library's mission to capture the historical record of the institution. These works cluster in the mid- to low range of the scholarly nature axis.

On the high end of the scholarly nature axis in the "external" category are society journals. Small society journals, in search of a sustainable publishing solution, crop up within Digital Commons repositories, which provide the hosting platform, and additional services, for these journals. As the role of the library as publisher continues to gain force, it is anticipated that more small society journals will be sponsored or hosted by university libraries.

Finally, there can be a third take on the external collection where the repository hosts material on behalf of others. This has been shown to be fruitful in directly engaging faculty and scholars. Two examples – from Cornell's Industrial and Labor Relations School (Cornell ILR) and from Utah State University (USU) – illustrate collections stewarded by the library and relevant to the disciplinary research in which their scholars routinely engage.

Cornell ILR School stewards and makes digitally accessible collections of Collective Bargaining Agreements from New York State and the US Department of Labor (Cornell University, 2008). The Cornell ILR repository functions as an "e-library" and includes, in addition to faculty content and a peer-reviewed journal, these extensive collections of government documents and labor-related materials, which make it one of the main sources for labor-related research and primary documents on the internet. For the Cornell ILR's Catherwood Library, stewardship of externally-created resources helps to engage a campus community and pull in more locally-produced scholarship. Faculty utilise the collections – historical in nature – as well as the journal in the course of their work and research. Here, the use of the IR as a research tool has increased faculty awareness and interaction. Cornell ILR's repository managers report a 65% participation rate from faculty, and this is without a mandate to deposit (DelRosso, 2010).

In terms of content type, the Cornell ILR repository utilises a strategy of housing content relevant to faculty's research – specifically, created by authors unaffiliated with the university, and with little review process. It provides an example of materials of interest outside the post-print collection scope which serve an important purpose for faculty engagement, and are able to create more awareness and, in a circular fashion, bring in more content.

A similar "elibrary" collection is beginning to be developed within the Utah State University (USU) repository. One of the participating campus libraries, the Quinney Natural Resources Research Library, developed, as its initial collection, a bibliography of aspen (a common tree species in North America) resources. This collection, originally housed on the server of a professor at another institution, required, at that time, a user to have certain software in order to access the bibliographic database. At that time, it was unavailable outside a very small community of specialists. In order to increase access and use of the bibliography, the professor worked with another at Utah State to migrate the database to USU's IR.

The bibliography is intended to be a comprehensive and searchable database of published and unpublished aspen references. Full texts are posted where available and permitted; elsewhere, citations point users to the location of a

full text. This initial collection has led to the creation of several others from the Quinney Library, including a conference series held across the country, but compiled and now retrospectively archived within the IR (Utah State University, 2010).

Administrative documents

Documents produced by administrative units or for administrative purposes are captured within the repository as part of a mission to archive the historical record of the institution. These documents – annual reports, donor reports, alumni magazines, and the like – serve either a reporting function or a fundraising function and thus are rarely reviewed by peers or editorial boards. They cluster on the "low" side of the scholarly nature axis. What, then, is the benefit to providing open access archival and/or publication services for this content? Some argue that focusing energy here only detracts from the real IR mission of collecting and providing open access to already-published journal articles.

In practice, supporting these collections enables the library to develop new relationships with units on campus or within colleges and departments – relationships that provide in-roads to administrative support, and to faculty and further content later on.

The library at California State Polytechnic University – San Luis Obispo (Cal Poly San Luis Obispo) utilises the repository as a tool to provide services to offices, departments and administrative units on campus.

The repository is considered by peer institutions as an example of repository success, and used as an aspirational model by many. In the Cal Poly San Luis Obispo Institutional Repository Annual Report to the Provost, the repository manager describes the breadth of work captured. Content includes:

> "Abstracts, alumni publications, annual reports, architectural plans, campus periodicals, campus photographs, conference proceedings, eBooks, finding aids, images of campus, master plans, master's theses, peer-reviewed journal articles, posters, PowerPoint presentations, press releases, research from campus institutes and centers, senior projects, speeches, staff publications, undergraduate essays." (Cal Poly, 2009).

In the case of Cal Poly, the liberal collection policy has freed the library to create new partnerships by providing publishing, dissemination, and archiving services for whatever content needs it.

An example of this is the collaboration between Cal Poly library and the Public Relations Office through making its archive of press releases ADA-compliant and publishing those to the open access repository. While the press releases had been online on the Office's website, they had struggled to ensure ADA-compliance. The library was able to solve that problem for them, by utilizing the technology of the repository. Both parties realized benefits. The press release collection is better discovered through the IR, and the Public Relations Office is able to get

better usage statistics on the content. Additionally, this initial service opened the door to further conversations about repository tools like journal publishing and image handling and display. The Cal Poly library now uses the IR to support Public Relations in publishing the electronic version of the Cal Poly alumni magazine, the Cal Poly Report, and manages two collections of often-requested images.

Content like this, while not scholarly in nature, supports key university initiatives, including better visibility of institutional assets for fundraising and recruitment purposes. As Donovan and Watson (2008) stated, in reference to a similar collection of materials, the presence of such work "raises the awareness of the institution's achievements among consumers of the now-discoverable content, a population likely to be meaningful to the institution's other goals such as fundraising and reputational rankings."

At Cal Poly, the IR is viewed by administrative parties as a tool to support advancement and recruitment. Where members of the Office of the Provost have invested in the Cal Poly IR, they remark about its utility in helping them to stay apprised of the scholarship and ideas generated at the institution, and aid in discovering key pieces of research that resonate with major donors (Bankier, Smith & Cowan, 2009). Where recruitment is concerned, the dean of libraries at Cal Poly San Luis Obispo described the president's perspective. In a speech after the first year of IR operations, he noted that the president found the senior honors projects in the IR very useful. Said Miller, "[The president] got excited when he understood that he could point prospects and their parents to the portfolios as examples of what students can accomplish at Cal Poly." (Miller 2008)

Finally, Cal Poly library's experience engaging the College of Engineering with the IR is instructive of the full value of an inclusive collection policy. The repository manager described this relationship in an interview with bepress in 2009:

> "One of the things we've found is that new audiences are constantly revealing themselves to us and that's been the most surprising piece. For instance, I presented to faculty at the College of Engineering. After the presentation, one of the attendees asked, "Can the repository be used for other things?" And we said, "Absolutely".
>
> The College is helping to direct new users to the repository, and the repository supports access to the research and administrative documents produced by the College. For example, the College of Engineering's Advancement Office has been contacting alumni and directing them to the annual report, which is available in the DigitalCommons@CalPoly. What is surprising and exciting is that two of their annual reports are consistently in the top ten downloads". (Ramirez, 2009).

The experience of the Cal Poly library demonstrates that a wide collection scope can offer value to both internal and external audiences for business purposes, including those related to campus administration, fundraising, and recruitment. By providing supporting services for fundraising and promotional efforts, the library increases its repository value to stakeholders, particularly administrative ones, across campus.

After the first two years of operations, Cal Poly's institutional repository had demonstrated substantial growth and use, becoming, of all Digital Commons repositories started within those two years, the first in number of downloads and number of objects (Cal Poly, 2009). There is no slow down or harm to its faculty content recruitment plans. If anything, the repository success has created greater awareness and interest.

Student work

Across the Digital Commons community, libraries collect a variety of student works. This includes: Ph.D dissertations, masters theses, other masters-level work, student journals, undergraduate research conferences, and honours papers. Student works rarely if ever enter the IR un-reviewed; rather, these fall into two categories: faculty reviewed; and, student reviewed. Like other work for which the repository is the initial locus of publication, this student work is nearly always open access (although most libraries do offer the option of embargo or campus-restricted access for ETDs. Anecdotal evidence shows that embargoes are asked or applied for only about 10% of the time).

Where dissertations, theses, and honors projects are concerned, the library in many cases has been able to position the repository as a submission and review management system to the graduate school or to individual departments. For the library, this is a win because it renews the library's role of service provider, and establishes its role as campus-based publisher. Additionally, by providing a submission and review management solution, the library is able to both meet a campus need and collect content earlier in the production process, fulfilling its internal goal of local collection development and preservation.

Open access student work generates readership for the repository. Royster (2008) reported that open access theses and dissertation in the University of Nebraska-Lincoln repository get 60 times more downloads than closed access theses and dissertations. Additionally, these OA theses and dissertations were downloaded 35 times more on average than any other type of content within the repository.

Readership that student produced works received outside of academia is also important. In this way, the IR is able to both contribute to the community and to support students as they seek employment, by allowing them to point to work they have already undertaken and offer numbers on its readership. As a case study on wide readership of student work, the Applied Research Project collection in Texas State San Marcos's repository is a good example. The Applied Research Projects (ARPs) are part of the Masters in Public Administration program there, and are the required capstone work for students graduating from that program. The topics addressed in the papers largely focus on municipal or state

government issues. Traffic data shows that approximately two-thirds the traffic to the collection comes from readers in Texas. The work draws readership mostly from local government officials, citizens, and practitioners. Both the director of the program and the students themselves have received enquiries (Bankier & Smith, 2010).

Incorporating student work brings big wins for the library. It increases readership to the IR and it has the potential to engage faculty too. Those faculty who are most concerned with teaching are able to use the repository services to provide publishing opportunities for students. In these cases, this is the library's "in" – from there, the library can take the opportunity to educate the professor about the benefits of also depositing his or her own work in the IR. As is the case in point with the ARP collection at Texas State San Marcos, the student publications further engaged the director and others in the program to submit their works to the IR as well.

Sometimes, the publishing services provided for students also help to recruit faculty. Illinois-Wesleyan University's repository, acting as a showcase of teaching and quality of student research, is used to publish several undergraduate journals. These journals give students practical insights into the peer review publication process; the journals also serve to recruit faculty. Robert Leekley (2007), publication adviser and chair of the Illinois-Wesleyan Economics Department, is quoted as saying: "It's very rare to have an entire publication generated solely with the work of undergraduates. We've actually used it when we recruit faculty. It's very impressive."

Faculty work

It is, of course, a given that faculty work would be included in the repository. But what type of faculty work? In examining the types of faculty-produced collections within Digital Commons repositories, there appears to be an array far larger and wider than the typical post-print collection. This stimulated investigation in order to look further into faculty-produced collections outside the journal article scope to see if any particular stories would lend insight into the types of faculty collections necessary to creating a successful repository.

First, it was noted that certain collections demonstrate use both within and outside of the academic community. Specifically, these are the types of content that fall in the middle of the x-axis – things like technical and research reports, newsletters, etc.

An instructive example comes from the University of Nebraska-Lincoln, the second largest IR in the United States (OpenDOAR, 2010). Royster (2009, p.74) notes:

> The University of Nebraska-Lincoln's repository is another example of a repository with a very inclusive collection policy. ….. The repository includes significant collections of beef cattle reports, wildlife damage management research, and a tractor test archives dating back to 1915 and continuing to this day. These

> collections, which sit amongst many open access post-print collections, still get some of the most traffic in the repository. Traffic to this content comes from across the state, with concentrations in urban centers Lincoln and Omaha, but with significant usage from rural Nebraskan farming communities. As the IR manager has described it: "Some of those little red dots you see across the state are not much more than 40 cows and a general store, but they're finding us and using the resources".

Beef cattle reports are by no means the traditional peer-reviewed post-prints one might expect to find in the IR, and yet they are works produced by expert scholars at the university. In collecting this work, the repository lays the groundwork for important relationships.

Again, by interacting with faculty and departments through these publications, the library increases IR visibility and awareness across campus.

Upon publishing a work to the IR, the library forms a relationship with an individual scholar. Each scholar with a piece of work in the IR (whether that work is a technical report or a post-print of a published journal article), begins to receive monthly reports on how often that work has been downloaded. The IR manager at University of Nebraska – Lincoln reports that monthly usage reports (delivered automatically by the IR to an author's email inbox) regularly prompts university scholars to become return depositors; in response to these monthly emails, scholars send in their CVs or copies of other work they would like published to the repository. Publication to the IR initiates a feedback loop essential to creating return depositors.

An additional benefit, of course, is that in publishing works that benefit the regional community, the library is able to support the university's mission to return the fruits of its labor to the communities that fund it, thereby making itself relevant to the university administration concerned with such things.

Second, it was found that the provision of publishing services enables the library to initiate or renew relationships with faculty, forward open access issues, and provide necessary services. Where the library can provide an essential service to its faculty, it is able to renew relationships and establish itself as a go to point, in this case for faculty seeking publishing support and advice.

The pay-off is that one faculty collection leads to others. Often, content outside of the narrow post-print collection comes first, with other work to follow. Bankier & Smith (2008), with regard to the Landscapes of Violence conference conducted at University of Massachusetts Amherst (UMass Amherst), noted

> "UMass Amherst Professor of Anthropology Ventura Perez and [Scholarly Communications and Special Initiatives Librarian] Marilyn Billings collaborated to [bring] Perez's conference, Landscapes of Violence, online. Soon, he decided to also start a journal of the same name, *Landscapes of Violence*."

LoV intends to publish its first issue in the Fall of 2010.

Similarly, at UMass Amherst, the digitization of the journal Contributions in Black Studies (CiBS) (published intermittently from 1977-1997) prompted discussions with the Afro-American Studies Department about creating a "sibling journal," to carry on the work of the no longer published CiBS. At this university, the IR has effectively impacted scholarly life on campus by enabling knowledge production in ways traditional publishing channels and a rigorous post-print only approach could not.

The secret is simple – archiving already-published articles, or the ancillary datasets, is not as enticing to faculty as producing new works of knowledge. Where the library can provide the tools for publication to faculty on campus, it is able to renew relationships that lead to further contact and content.

CONCLUSION

Karla Hahn (2008), now Executive Director of ARL, wrote:

> "We may acknowledge that scholarly works will change and yet behave as if anything that doesn't look like a traditional work of scholarship is not a scholarly work; thus the immutability of traditional publishing models becomes axiomatic. Different becomes less by definition. From this perspective, any counter-example is regarded as exceptional rather than appreciated as transitional or transformational."

No longer can IR managers reject non-faculty work as counter to the IR mission when inclusive collection policies seem to contribute so much to the success of well-respected repositories. To do so would be to maintain the long-standing but limited vision of "scholarship" and to fall into the same "circularity of thought" Hahn also cautions against.

Looking across the landscape as a whole, it appears that the repository is a significant response to the traditional commercial publishing regime, giving greater visibility and access not just to the traditional products of publishing, but in fact, giving greater visibility and access to scholarly content that would never before have had the opportunity to be published.

It has been argued that collecting work like this, often non-peer reviewed work, will negatively affect the perception of the repository amongst faculty, thus reducing participation. This has not proven to be the case for Cal Poly San Luis Obispo, University of Nebraska - Lincoln, University of Georgia School of Law, Texas State San Marcos, Cornell ILR, and UMass Amherst. In fact, these repositories thrive, and are generally considered by their peers as aspirational models.

As Jennifer Howard (2010) wrote, "There has been a lot of hoopla about institutional repositories in the last few years, as Harvard and other universities have adopted open-access policies." After an analysis of the repository landscape she too concludes, "For most repositories, the future probably looks less like Harvard's and more like Nebraska's."

Digital Commons repositories do collect faculty refereed journal articles. But by

and large, none limit the repository to this. Those that solicit and accept a wide variety of content types are the libraries that succeed in engaging both the faculty and the community. Within the Digital Commons community, it is clear that the IRs that both perceive themselves to be successful and are seen as successful by their peers are the ones with the most open and inclusive collection policies. In assessing factors of repository success amongst these examples, it seems that an essential component is to widen the repository collection to beyond faculty work.

APPENDIX A

This appendix provides examples of the types of content held by a range of repositories.

Non-research output: http://scholarship.law.georgetown.edu/cong/
Datasets/Primary research: http://scholarworks.umass.edu/french_translators/
Faculty Conference: http://commons.pacificu.edu/conferences/
Faculty Journal: http://ir.lib.uwo.ca/cjsotl_rcacea/
Book: http://digitalcommons.butler.edu/facsch_papers/76/
Post-print: http://digitalcommons.calpoly.edu/cenv_fac/145/
Committee Meetings: http://digitalcommons.unl.edu/birdstrike/
Newsletter: http://jdc.jefferson.edu/hpn/
Research Finding: http://commons.pacificu.edu/verg/3/
Research Reports: http://digitalcommons.unl.edu/animalscinbcr/
Dissertation: http://ir.uiowa.edu/etd/223/
Masters Theses: http://ecommons.txstate.edu/arp/285/
Graduate Journal: http://epublications.marquette.edu/gjcp/
Undergrad Conference: http://scholarworks.boisestate.edu/under_conf/2009_under_conf/
Undergrad Journal: http://digitalcommons.iwu.edu/peer_review_list.html
Honors Papers: http://digitalcommons.conncoll.edu/histhp/1/
Admin Report: http://digitalcommons.calpoly.edu/ceng_dean/
Alumni Magazine: http://digitalcommons.law.umaryland.edu/jd/
Society Journal: http://digitalcommons.unl.edu/insectamundi/
Symposium: http://digitalcommons.law.uga.edu/conf_coll_symp_symposia/48/
Historical Collection: http://digitalcommons.bryant.edu/kaplan_war/2/
Commencement address: http://digitalcommons.law.uga.edu/lectures_pre_arch_lectures_grad/1/
Policy Report: http://digitalcommons.unl.edu/icwdm/

REFERENCES

Bankier, Jean-Gabriel & Courtney Smith. 2008. Establishing library publishing: Best practices for creating successful journal editors, *ELPUB 2008* Conference Proceedings. http://works.bepress.com/jean_gabriel_bankier/2/

Bankier, Jean-Gabriel, Courtney Smith, & Kathleen Cowan. 2009. *Making the case for an institutional repository to your provost*. Berkeley Electronic Press White Paper. http://works.bepress.com/ir_research/28/

Bankier, Jean-Gabriel & Courtney Smith. 2010. Digital repositories at a crossroads: Achieving sustainable success through campus-wide engagement. *VALA 15th Biennial Conference*, Melbourne, February 9-11. http://www.vala.org.au/vala2010-proceedings/vala2010-session-6-bankier

Basefsky, Stuart. 2009. *The end of institutional repositories and the beginning of social academic research service: An enhanced role for libraries*. http://www.llrx.com/features/socialacademicresearch.htm

CalPoly. 2009. *Digital commons. Institutional repository annual report to the provost 2009*. http://digitalcommons.calpoly.edu/lib_dean/22/

Cochrane, Tom G. & Paula A Callan. 2007. Making a difference: Implementing the eprints mandate at QUT. *International Digital Library Perspectives*. 23(3): 262-268. http://eprints.qut.edu.au/6916/1/6916.pdf

Cornell University. 2008. *Collective bargaining agreements*. http://digitalcommons.ilr.cornell.edu/cba/

Davis, Philip M. & Matthew Connolly. 2007. Institutional repositories: Evaluating the reasons for non-use of Cornell University's installation of D-Space. *D-Lib Magazine*. 13(3/4). http://www.dlib.org/dlib/march07/davis/03davis.html

DelRosso, Jim. 2010. *Personal correspondence*.

Donovan, James M. & Carol A Watson. 2008., White paper: Behind a law school's decision to implement an institutional repository. *Articles, Chapters and Online Publications. Paper 15*. http://digitalcommons.law.uga.edu/law_lib_artchop/15

Hahn, Karla. 2008. *Current models of digital scholarly communication*. November. Ithaka and ARL. http://www.arl.org/bm~doc/current-models-report.pdf

Harnad, Stevan. 2009. Institutional repositories: The great debate, topic 4: Institutional repository success is dependent upon mandate. *ASIS&T Bulletin*. April/May 2009. http://www.asis.org/Bulletin/Apr-09/AprMay09_Harnad-McGovern.html#15\

Howard, Jennifer. 2010. Digital repositories foment a quiet revolution in scholarship. *The Chronicle of Higher Education*. June 18

Leekley, Robert. 2007. *Students take lead on publications*. http://www2.iwu.edu/CurrentNews/newsrelease07/stn_Tributaries_507.shtml

Miller, Michael. 2008. Welcome and Introduction. Presentation at *Putting knowledge to work: Building an institutional repository for your campus*. October 10,2008. San Luis Obispo, California.

OpenDOAR. 2010. *The directory of open access repositories*. http://www.opendoar.org/

Ramirez, Marisa. 2009. *Ramirez in Digital Commons Subscriber Newsletter*. Spring. http://digitalcommons.bepress.com/newsletter/1/

Royster, Paul. 2008., Publishing original content in an institutional repository. *Serials Review*. doi:10.1016/j.serrev.2007.12.003. http://digitalcommons.unl.edu/libraryscience/126/

Royster, Paul. 2009. Institutional repositories. American Library Association Annual Convention, presentation co-sponsored by ACRL EBSS E-Resources in Communication Studies Committee and ACRL Scholarly Communications Committee. Chicago, Illinois. July. http://works.bepress.com/paul_royster/87/

Sale, Arthur. 2007. The patchwork mandate. *D-Lib Magazine*. 13(1/2). http://www.dlib.org/dlib/january07/sale/01sale.html

Salo, Dorothea. 2008. Innkeeper at the Roach Motel. *Library Trends*. 57(2).

Thomas, C. & H. McDonald, R. 2008. Moving beyond usage & impact data: Institutional repositories, organizational performance assessment, and standardized reporting metrics. In: *Third International Conference on Open Repositories* Southampton, England. 1-4 April. http://pubs.or08.ecs.soton.ac.uk/57/

Utah State University. 2010. *Digital commons: aspen bibliography*. http://digitalcommons.usu.edu/aspen_bib/

PROGRAMMING NOT REQUIRED: SKILLS & KNOWLEDGE FOR THE DIGITAL LIBRARY ENVIRONMENT

Katherine Howard

Education for Library and Information professionals in managing the digital environment has been a key topic for discussion within the LIS environment for some time. However, before designing and implementing a program for digital library education, it is prudent to ensure that the skills and knowledge required to work in this environment are properly identified in order to enable informed programs to be developed and delivered. Hitherto, there appears to have been limited research which has included the opinion of both educators and practitioners, on this topic. This paper presents the key findings of research undertaken at Tallinn University in the first half of 2009.

Katherine Howard, Queensland University of Technology (QUT), Brisbane 4000.
Email: k1.howard@qut.edu.au

INTRODUCTION

Library and Information Science (LIS) education in Australia, like many other countries around the world, has been and is moving through a period of evaluation and change, as the educational and skill requirements for librarians and information workers of the future evolve in the light of the rapidly changing LIS environment. In Australia, this is evidenced by the activities of the Australian Library and Information Association (ALIA), including the Education and Workforce Summit held in March 2008 (ALIA, 2008), and the National Advisory Congress (NAC) held in July 2008 (ALIA, 2009). Among other things, the Workforce Summit explored broader issues surrounding library and information education, whilst the NAC discussed what needed to be done to ensure information workers possess the appropriate skills and knowledge necessary for a future workforce faced with a radically changing working environment.

The study reported here investigated what is perhaps one of the most challenging facets of the evolving LIS field – managing the digital library. The stimulus for this study was the realisation that LIS schools in the United States and Europe were offering dedicated digital library programs, often at the masters level, yet a

scan of Australian LIS programs revealed that the same could not be said of LIS schools here. Specifically, the awareness of the existence, outside of Australia, of two specialised masters programs in digital library education and one project concerning digital library curricula, suggested they could serve as examples to inform local developments. The available existing programs are:

- An International Masters in Digital Library Learning (a joint masters program from Oslo University College, Parma University, and Tallinn University).
- A Masters in Digital Library and Information Services (University of Borås, Sweden), and
- The Digital Library Curriculum Project (University of North Carolina, Chapel Hill, and Virginia Tech collaboration)

STATEMENT OF THE PROBLEM

Spink & Cool (1999) highlighted the fact that despite the surge in digital library research and development at that time, very little support had been provided to enable development of the programs and curricula required to educate information professionals to work in the digital library environment. They acknowledged that "we do not know what knowledge is required to produce information or computer professionals to work as digital librarians, digital developers, or in other job categories…" In Australia at least, this still seems to be the case, with no evidence found of research being carried out specifically for digital library education.

However, before determining if there is a need for a dedicated digital library program in Australian LIS schools, it is important to understand what - in terms of both skills and knowledge - is actually required to work in a digital library environment: has understanding improved in the decade since Spink and Cool were writing? The continued absence of this understanding was noted by Weech in 2005, who reiterated that "we do not know much about what skills are needed for professionals who work as digital librarians." This suggestion that there is an ongoing lack of knowledge over the actual role of digital librarians and thus in their preparation for that role, reinforces the need to gain some insight into the skills and knowledge required, which might then be incorporated into the curriculum of a targeted digital library program. This paper therefore focuses on the key findings of an Australia-wide survey that sought to identify the skills and knowledge required to work in the digital library environment and the impact these findings might have for designing relevant LIS curricula.

Thus, the current research targeted practitioners already working in this area to ascertain their understanding of the skills and knowledge required to be successful and also, as a means of triangulation, asked LIS educators for their opinion about what they believed practitioners needed to work effectively in a digital library environment. This strategy was also useful in determining if there was a discrepancy or concurrence between practitioners' and educators' opinions (previous research has routinely noted the gap between educators'

and practitioners' viewpoints and emphasised the need to try and overcome this (Harvey & Higgins, 2003; Hallam, 2007). By seeking the opinion of both practitioners and educators, the study aimed to highlight what, if any differences do in fact exist, at least in this one sector of the LIS discipline.

A review of the literature revealed that with the exception of two studies (Partridge & Hallam, 2004; Choi & Rasmussen, 2006), staff actually working in the LIS environment had not hitherto been surveyed as to the skills they needed to perform their jobs effectively. The vast majority of studies that identify and discuss the skills required consist of content analyses performed on job advertisements. Other studies sought the opinions of employers – whether that be directly (i.e., library directors) or via employment agencies. Although both methods are a valid way to ascertain the skills required to get a job, they do have limitations, as often the "ideal applicant" is profiled, reflecting employers' expectations rather than establishing the skills of the successful applicant. Additionally, these studies have not, for the most part, had an Australian focus, nor have many been undertaken with regard to specifically digital positions. One Australian study which did seek the opinions of educators and practitioners (and also students) is that of Partridge and Hallam, which identified the "skills, knowledge and attitudes of the archetypal information professional for the twenty-first century." (2004, p. 1)

The current study differed from the previous research in two ways. First, the focus was on the skills and knowledge required specifically in the digital library environment rather than the broader perspective. Second, coverage was extended to cover the entire Australian LIS environment. As far as has been determined, no previous study has been undertaken which focuses on the requirements of digital library positions within Australia, nor has any study surveyed both Australian educators and practitioners specifically about the digital library environment.

Definitions

It was not the intention of the study to debate differences in terminology between skills, competencies, attributes, and qualities, nor what belongs in each category. The intention was to ascertain what is required of a library and information professional in a digital library environment, regardless of the labels that may or may not be applied. However, it is acknowledged that the term "skills" can be extremely broad and encompassing. Therefore, it was refined into two sub-categories – Personal Skills and Generic Skills – which are based on the categorisation of skills made by Orme (2007). Definitions for Personal Skills and Generic Skills which informed the study were based on the distinction made by Khoo (2005) and are as follows:

- Personal Skills: appropriate attitudes, values and personal traits, including enthusiasm, reliability, being responsible and self motivated, and having a sense of humour.
- Generic Skills: being skills that cut across disciplines, and include things such as leadership, communication, and teamwork.

The use of the term "skills" throughout this paper incorporates both Personal

and Generic Skills as defined above. When referring specifically to one or other of these sub-categories of skills, the applicable specific term is used.

The word 'specific' was added to Partridge and Hallam's 'discipline knowledge' to highlight the fact that this is "knowledge over which the profession claims unrivalled expertise." (Kennan, Cole, Willard, Wilson & Marion, 2006). The explanation given in the survey questionnaire was:

- Discipline specific knowledge: knowledge that is learnt in a Library and Information Science university program (either undergraduate or postgraduate) or that has been learnt since graduation (for example through CPD or on the job).

The term "knowledge" when used throughout this paper is inclusive of the definition provided here.

Limitations and Scope

Practitioners from Australian academic libraries and Australian educators were the target groups surveyed in the study. For the time frame allowed for this study, it was not possible to include all library sectors, so a choice had to be made. Practitioners from academic libraries were targeted as the majority of digital job titles (Digital Services Librarian, Digital Resources Librarian, and so on) were – from observing job advertisements prior to undertaking the study – located within the academic sector.

METHODOLOGY

A survey research methodology was used to investigate the skills and knowledge required of an information professional working in a digital library environment. The study utilised a combination of open and closed questions, thus providing both qualitative and quantitative data.

Sampling strategy and techniques

Two purposive sampling techniques known as expert sampling and snowball sampling were employed in order to identify respondents from both target groups who may have specialist knowledge in the area of digital libraries (Trochim, 2006). For the practitioners, this involved identifying those working in positions with digital responsibilities (as far as could be determined by their job title) in academic libraries. However, no academic librarian was prevented from responding, as it was considered that many may have expertise in this area despite not holding a position or title which reflected this. Posts were made to ALIA e-lists in each State and Territory in an effort to gain good geographical representation; to ensure wide communication of the study; and to give as many academic librarians as possible the opportunity to participate.

The university websites targeted were those which offered ALIA accredited LIS programs either at undergraduate or postgraduate level. The staff lists for these programs were then consulted to identify staff that taught digital library related subjects, or who listed digital libraries in their research interests. However, it

was not limited to such staff. The rationale behind selecting these respondents was due to the consideration that they may have specialised knowledge in the area of digital libraries and therefore may be able to provide more in-depth responses, which is in keeping with the expert sampling technique. The inclusion of educators who did not have any identified interest in digital libraries offset any bias that may have resulted. As for the practitioners, it was recognised that there may be educators who have knowledge of and/or an interest in digital libraries, but who were not explicitly identified as such on their universities' websites. A post to the ISEF (Information Studies Educators' Forum) further disseminated the call for participation.

Data collection

An online questionnaire was selected for the data collection method as it was believed to be the most effective means of collecting data from Australian respondents when the researcher was based in Europe. As the study intended to identify any potential trends or consensus amongst respondents, a questionnaire was deemed the most beneficial technique to achieve this aim, as a broader perspective could be gained. A further benefit and time-saving factor of the online questionnaire is that results can be automatically collated and summarised, ready for analysis.

The selection of skills and knowledge included in this section of the questionnaire was derived from the scholarly literature: the list of Personal Skills were based on Goulding et al. (1999); Generic Skills were based on a compilation of Fisher (2004); Partridge & Hallam (2004); and Orme (2007); and Discipline Specific Knowledge was derived from Choi & Rasmussen (2006). These particular sources were selected due to the size and/or comprehensive nature of the sources consulted in each study. After a review of the literature, it was deemed that these studies were most closely aligned with the aims and objectives of the current study.

It could be argued that there is extant literature that covers these Personal and Generic Skills and that including them in the questionnaire was therefore superfluous. However, it was decided to retain this aspect for three reasons. First, to ensure that coverage of the skills required is comprehensive; second, to ensure that respondents didn't feel the need to add skills such as 'Communication' and 'Teamwork' when asked to list 'any other skills required'; and finally, due to the age of some of the literature utilised (e.g. Goulding et al.) to confirm if these Personal and Generic Skills are still relevant today and in the digital library environment.

RESULTS AND DISCUSSION

The percentages provided throughout this section are calculated on the actual number of responses received for each question. For example, 16 educators provided responses to the Demographics section, but only 13 provided responses

to the questions on Personal Skills, Generic Skills and Discipline Specific Knowledge. The percentages are therefore calculated on totals of 16 and 13 respectively.

The educators obtained a higher completion rate for the questionnaire. Sixteen questionnaires were started, with 11 (69%) being fully completed. The number of questionnaires started by practitioners was 92, with 52 (57%) being completed.

Demographics

All the questions relating to demographic information were completed by both practitioners (92 responses) and educators (16 responses). The feminised nature of the LIS discipline was, not surprisingly, reinforced by the data collected in this study, as is the aging of the profession. This was more marked in the educators, with the number of respondents in the 50-59 age group higher for educators with 8 respondents (50%) as opposed to the practitioners' 29 respondents (30%). The higher level is also evident in the 60+ age group, with 2 respondents (13%) from the educators and 3 (3%) from the practitioners belonging to this group.

Geographical representation was somewhat changeable between the two groups, with one location (Western Australia) gaining more than six-fold percentage increase in terms of the educators' responses (3 responses, 19%) compared to the practitioners from that state (3 responses, 3%). The remaining states and territories were all represented by both practitioner and educator respondents, with the exception of educators from the Northern Territory (no responses).

Skills and knowledge

In this section of the questionnaire, respondents were provided with a list of skills generated from the scholarly literature as noted earlier. Respondents were asked to rate the skills given as either "Highly Desirable" (HD), "Desirable" (D) or "Less Desirable" (LD). Tables 1, 2 and 3 show the number of responses given to the list of Personal Skills, Generic Skills and Discipline Specific Knowledge by both educators and practitioners, along with the percentages. There were a total of 13 educator responses and 54 practitioner responses for each of these three questions.

Personal Skills

The Personal Skills deemed most "Highly Desirable" for the practitioner respondents was the need to be 'Flexible' (41 responses, 76%), followed by 'Able to deal with a range of users' (35 responses, 64%), and 'Adaptable' (33 responses, 61%). Educators selected 'Reflective' as the most "Highly Desirable" skill required of a Library and Information Professional in a digital role within an Academic Library, with 11 (85%) selecting this option. 'Detective like' and 'Responsive to others' needs' followed, with both receiving 10 (77%) responses.

Table 1: Responses to Personal Skills

	Educators			Practitioners		
Skill name	**HD**	**D**	**LD**	**HD**	**D**	**LD**
Able to accept pressure	5(38%)	7(54%)	1(8%)	19(35%)	33(61%)	2(4%)
Able to deal with a range of users	9(69%)	4(31%)	0(0%)	35(64%)	18(33%)	1(1%)
Adaptable	7(54%)	6(41%)	0(0%)	33(61%)	20(37%)	1(1%)
Confident about ability	5(38%)	8(58%)	0(0%)	17(31%)	34(62%)	3(6%)
Dedicated	6(46%)	7(54%)	0(0%)	14(26%)	38(70%)	2(4%)
Detective like	10(77%)	3(23%)	0(0%)	27(50%)	23(42%)	4(7%)
Empathetic	6(46%)	6(46%)	1(8%)	16(30%)	33(61%)	5(9%)
Energetic	7(54%)	6(46%)	0(0%)	16(30%)	35(64%)	3(6%)
Enthusiastic	8(62%)	5(38%)	0(0%)	20(37%)	30(55%)	4(7%)
Flexible	9(69%)	4(31%)	0(0%)	41(76%)	13(24%)	0(0%)
Friendly	5(38%)	7(54%)	1(8%)	15(27%)	36(66%)	3(6%)
Hard working	6(46%)	7(54%)	0(0%)	15(27%)	38(70%)	1(1%)
Innovative	8(62%)	5(38%)	0(0%)	30(55%)	23(42%)	1(1%)
Inquisitive	9(69%)	4(31%)	0(0%)	31(57%)	23(42%)	0(0%)
Interested in area of work	8(62%)	5(38%)	0(0%)	32(59%)	20(37%)	2(4%)
Logical	7(54%)	6(46%)	0(0%)	22(40%)	29(53%)	3(6%)
Meticulous	4(31%)	9(69%)	0(0%)	18(33%)	32(59%)	4(7%)
Open minded	8(62%)	5(38%)	0(0%)	22(40%)	31(57%)	1(1%)
Organised	7(54%)	6(46%)	0(0%)	30(55%)	22(40%)	2(4%)
Pleasant manner	5(38%)	7(54%)	1(8%)	15(27%)	36(66%)	3(6%)
Reflective	11(85%)	2(15%)	0(0%)	13(24%)	36(66%)	5(9%)
Reliable	9(69%)	4(31%)	0(0%)	21(38%)	31(57%)	2(4%)
Responsible	7(54%)	5(38%)	1(8%)	23(42%)	30(55%)	1(1%)
Responsive to others' needs	10(77%)	3(23%)	0(0%)	31(57%)	23(42%)	0(0%)
Self motivated	8(62%)	5(38%)	0(0%)	31(57%)	22(40%)	1(1%)
Sense of humour	7(54%)	4(31%)	2(15%)	15(27%)	33(61%)	6(11%)
Thorough	6(46%)	7(54%)	0(0%)	23(42%)	29(53%)	2(4%)
Willing to do all kinds of work	5(38%)	6(46%)	2(15%)	17(31%)	30(55%)	7(13%)

The practitioners' most highly rated skill – 'Flexible' – is supported by much of the literature, with Orme (2007), Goulding et al. (1999), Lynch & Smith (2001)

and Feret & Marcinek (1999) all reporting this skill amongst the most important or frequently occurring in their respective studies. Goulding et al. also noted 'Able to accept pressure' and 'Ability to deal with a range of users' as a further two important skills. The results of the current study also show the importance of 'Ability to deal with a range of users' with educators ranking this skill in fourth place, whilst practitioners placed even more importance on it by ranking it in second place. 'Able to accept pressure' was not as important for respondents in the current study with practitioners ranking it in seventeenth place and educators in nineteenth place. Table 1.1 shows Goulding et al's top ten Personal Skills and the corresponding rankings from the current study.

Table 1.1: Top 10 Personal Skills identified by Goulding et al. and corresponding practitioner and educator rankings.

Skill	**Rank** (Goulding et al.)	**Rank & Percentage** (Educators)	**Rank & Percentage** (Practitioners)
Able to accept pressure	1	19 (38%)	17 (35%)
Flexible	2	5 (69%)	1 (76%)
Ability to deal with a range of users	3	4 (69%)	2 (64%)
Written communication	4	Generic Skill in current study	Generic Skill in current study
Inquisitive	5	6 (69%)	5 (57%)
Reflective	6	1 (85%)	28 (24%)
Dedicated	7	15 (46%)	27 (26%)
Detective like	8	2 (77%)	10 (50%)
Leadership qualities	9 (equal)	Generic Skill in current study	Generic Skill in current study
Innovative	9 (equal)	9 (62%)	8 (55%)

Some of the additional Personal Skills offered by educators in answer to the open question included being imaginative, curious, and a risk taker; and having tolerance and an international view. Two respondents questioned how applicable the list of skills was to digital positions, suggesting that all skills were necessary for any LIS professional. Although this is certainly a valid point, it was intended that the list of skills provided be as comprehensive as possible, as explained earlier. It was not intended to debate whether these skills were highly desirable in any job role, but to ascertain if they were also desirable (and to what extent) in a digital library environment.

Practitioners offered patience, persistence, having a positive approach, and the ability to recognise personal limitations and to ask for support when needed. An interesting response was the "ability to work with IT tech heads (trust me this is a

skill)" (Respondent #73), indicating that perhaps up-skilling in the 'language' of IT might be to the advantage of the LIS discipline.

Generic Skills

Practitioners identified the following Generic Skills as being the most important in order to carry out their jobs - 'Communication' (47 responses, 87%); 'Critical skills/thinking' (41 responses, 76%) and 'Problem solving' (40 responses, 74%). The first four most "Highly Desirable" Generic Skills as rated by educators all received 10 responses (77%) - 'Communication', 'Critical skills/thinking', 'Ethics and social responsibility', and 'Information literacy' skills.

Table 2: Responses to Generic Skills

	Educators			Practitioners		
Skill name	**HD**	**D**	**LD**	**HD**	**D**	**LD**
Business acumen	4(31%)	8(62%)	1(8%)	8(15%)	30(56%)	6(30%)
Change management	5(38%)	5(38%)	3(23%)	30(56%)	3(6%)	1(1%)
Communication	10(77%)	3(23%)	0(0%)	47(87%)	7(13%)	0(0%)
Critical thinking	10(77%)	3(23%)	0(0%)	41(76%)	13(24%)	0(0%)
Ethics and social responsibility	10(77%)	3(23%)	0(0%)	30(56%)	17(31%)	7(13%)
Financial	4(31%)	6(46%)	3(23%)	26(48%)	4(44%)	4(7%)
Grant/proposal writing	3(23%)	7(54%)	3(23%)	30(56%)	6(30%)	5(9%)
Information Literacy	10(77%)	2(15%)	1(8%)	33(61%)	17(31%)	4(7%)
Leadership	8(61%)	5(38%)	0(0%)	17(31%)	34(63%)	3(6%)
Negotiating	7(54%)	5(38%)	1(8%)	27(50%)	23(42%)	4(7%)
Human Resource	4(31%)	5(38%)	4(31%)	29(54%)	4(26%)	3(6%)
Problem solving	9(69%)	4(31%)	0(0%)	40(74%)	13(24%)	1(1%)
Project management	7(54%)	5(38%)	1(8%)	27(50%)	24(44%)	3(6%)
Promotion and marketing	6(46%)	4(31%)	3(23%)	34(63%)	5(9%)	2(4%)
Research	8(62%)	4(31%)	1(8%)	31(57%)	22(41%)	1(1%)
Teamwork	9(69%)	4(31%)	0(0%)	39(72%)	15(28%)	0(0%)

"Highly Desirable" choices of Generic Skills were more closely aligned between the two groups, with a consensus being reached with the top two skills of 'Communication' and 'Critical skills/thinking.' The choice of 'Communication'

being ranked in first place by both practitioners and educators is also supported in the literature, with several studies using differing methodologies citing this as an important skill (Orme, 2007; O'Connor & Li, 2008; Gerolimas & Konsta, 2008; Choi & Rasmussen, 2006; Fisher, 2004; Partridge & Hallam, 2004; Lynch & Smith, 2001; Feret & Marcinek, 1999). 'Critical thinking' is mentioned in Partridge and Hallam and 'Critical skills' in Fisher as being necessary skills for the 21st century. Despite a considerable consensus between the two respondent groups, the dichotomy between theory and practice as discussed by Hallam (2007, p.1) is perhaps exemplified and reinforced by the results relating to 'Ethics and social responsibility' and the Personal Skill of 'Reflective' that can be seen in Table 1.

It is surprising that 'Leadership' is not more highly rated by practitioners, given that 'Leadership potential' was one of the skills and attributes that Hallam (2008) discusses in relation to the "possible gap between the desired skills […] sought by employers and the extent to which applicants for jobs […..] demonstrated these skills…". Other studies that highlight 'Leadership' as an important skill include Fisher (2004); O'Connor & Li (2008); Lynch & Smith (2001); Goulding et al. (1999), and Feret & Marcinek (1999).

Some of the Generic Skills offered by practitioner respondents when asked to list any other skills they deemed necessary to carry out their job included good memory, stress management, ability to prioritise and decision making. One educator's response to this open question suggested erudition and original thinking as additional skills.

Discipline Specific Knowledge

The most "Highly Desirable" options selected by practitioners for Discipline Specific Knowledge were 'User needs' attracting 36 responses (66%) and both 'Copyright' and 'Metadata' receiving 27 responses (50%). Educators selected 'User needs' as the most "Highly Desirable" with 9 respondents (69%) choosing this option, with 'Metadata' in second place with 8 responses (62%). 'Collection development', 'Content management systems' and 'Copyright' were equal third place, all receiving 7 responses (54%).

Table 3: Responses to Discipline Specific Knowledge

	Educators			Practitioners		
Skill name	**HD**	**D**	**LD**	**HD**	**D**	**LD**
Basic system admin	2(15%)	7(54%)	4(31%)	16(30%)	28(52%)	10(18%)
Collection development	7(54%)	5(38%)	1(8%)	19(35%)	28(52%)	7(13%)
Content mgt systems	7(54%)	5(38%)	1(8%)	16(30%)	32(59%)	6(11%)
Copyright	7(54%)	6(46%)	0(0%)	27(50%)	26(48%)	1(1%)

	Educators			Practitioners		
Skill name	**HD**	**D**	**LD**	**HD**	**D**	**LD**
Database development / Database mgt system	5(38%)	8(62%)	0(0%)	18(33%)	27(50%)	9(16%)
Digital archiving & Preservation	6(46%)	7(54%)	0(0%)	19(35%)	32(59%)	3(5%)
Digital imaging	5(38%)	8(62%)	0(0%)	17(31%)	27(50%)	10(18%)
DL architecture	5(38%)	8(62%)	0(0%)	15(27%)	27(50%)	12(22%)
DL software	5(38%)	7(54%)	1(8%)	19(35%)	29(53%)	6(11%)
Digital protocols	5(38%)	7(54%)	1(8%)	16(30%)	26(48%)	12(22%)
ILMS	4(31%)	7(54%)	2(15%)	33(61%)	4(7%)	3(6%)
Licensing	4(31%)	8(62%)	1(8%)	20(37%)	27(50%)	7(13%)
Metadata	8(62%)	5(38%)	0(0%)	27(50%)	26(48%)	1(1%)
Programming languages	0(0%)	8(62%)	5(38%)	25(46%)	22(41%)	0(0%)
Technical and quality standards	3(23%)	9(69%)	1(8%)	8(14%)	34(63%)	12(22%)
User needs	9(69%)	4(31%)	0(0%)	36(66%)	18(33%)	0(0%)
Vendor negotiation	4(31%)	7(54%)	2(15%)	30(56%)	10(18%)	
Web design	4(31%)	9(69%)	0(0%)	14(26%)	28(52%)	12(22%)
Web mark-up languages	1(8%)	10(77%)	2(15%)	27(50%)	14(26%)	

Other areas of Discipline Specific Knowledge suggested by educators illustrates the wide and varied perspectives held regarding the knowledge required of information professionals in the digital environment. They include Research Techniques and Usability Testing; and "Evaluation of information; understanding how people make meaning of information and, ultimately, use it - regardless of whether it is digital or not" (Respondent #5).

One of the key themes to emerge from practitioners' responses to the open question about any additional knowledge required to work in a digital library environment was that it is context specific and dependent on the job that one performs, with one respondent noting:

> "I think you need to learn each of the above depending on how much you rely on it to do your job effectively. [If] you learn't [sic] everything [thoroughly] I think you would have information

> overload. Sometime[s] a basic understanding is all you really need." (Respondent #7)

This highlights the difficulties educators face when developing curricula for LIS programmes, and not only in relation to the digital aspect of LIS. Professional Development (PD) may be a useful approach in terms of more general up-skilling or specifically for those wishing to move into more specialised digital roles.

Many of the highly rated selections of Discipline Specific Knowledge in this study concur with the study that informed this section of the questionnaire, that of Choi & Rasmussen (2006) including 'User needs', 'Metadata', and 'Collection development.' However, 'Technical and quality standards' by contrast was ranked considerably lower in the current study – in seventeenth place by the educators and in eighteenth place for the practitioners. Despite this, one practitioner respondent expressed concern over the lack of knowledge of standards noting that:

> "….. so many people are undertaking digital projects without authoritative knowledge , doing the work in ad hoc ways and not [complying] to or considering any standards" (Respondent #87)

Some of the areas identified by Tennant (1999) as being required to work in a digital library environment were not supported by the results of the current study. As can be seen in Table 4, 'Web markup languages' (e.g.: XML, HTML) and 'Programming languages (e.g.: Perl, Java, JavaScript, Python, SQL)' were particularly low-ranked:

Table 4: Comparative list of Discipline Specific Knowledge as identified by Tennant (1999).

Knowledge required as identified by Tennant	**Rank & Percentage** (Educators)	**Rank & Percentage** (Practitioners)
Imaging technologies ("Digital imaging" in current study)	7 (38%)	9 (31%)
Web mark-up languages	18 (8%)	17 (24%)
Programming languages	19 (no respondents)	19 (13%)

As the practitioners who responded to this questionnaire were employees of academic libraries, there is a strong likelihood that the library is supported by an IT department, which may account for the low ranking for the mark-up and programming languages. This reason may also be extended to include the educators, as they too may assume the presence of IT professionals in an academic library environment. Much of the literature surrounding the knowledge required to work in a digital library environment is quite broad, and tends to focus on either generic or personal skills rather than the discipline specific knowledge as defined by this study. The reason given by Tennant may well in fact be appropriate – that

technology changes so rapidly that it may be preferable to employ staff who can deal with this ever changing environment (Personal Skills) rather than to employ someone who is already an expert, as his/her skills may be obsolete very quickly. However, it is interesting to note that both educators and practitioners in the current study are in relative agreement with their lower ranking of these technically oriented areas of knowledge.

CONCLUSIONS

On the whole, despite differences in the ratings of some specific skills, practitioners and educators generally rated broader Personal Skills and Generic Skills as either "Highly Desirable" or "Desirable," indicating that this aspect of the information professional working in a digital environment is comparable to that of a 'traditional' information professional with a 'non-digital' job title. This is perhaps not surprising, but does confirm that these types of skills and knowledge are still seen as highly relevant today, even in the digital library environment.

The results for Discipline Specific Knowledge were somewhat different, however, with a larger proportion of responses from both practitioners and educators being selected as "Less Desirable" in comparison to both the Personal and Generic Skills, perhaps indicating more uncertainty regarding the knowledge that is required to work in the digital library environment. The highest responses in the "Less Desirable" category were for the more technical options, such as programming languages (eg: Perl, Java, JavaScript, Python, SQL), web mark-up languages (eg: XML, HTML), digital library architecture (eg: peer-to-peer, service oriented architecture etc.), and digital protocols. Supporting this response, these options are also some of the lowest ranked skills in the "Highly Desirable" category. However it should be noted that web mark-up languages was the highest ranked option by educators in the "Desirable" category, in contrast to the practitioners. As mentioned, a possible reason for these overall lower rankings is the high probability that within an academic library setting there is a dedicated team of IT professionals who have and utilise this knowledge, thereby diminishing the importance for LIS professionals. Additionally, Marion's (2001) suggestion that the notion of a digital library itself is evolving, so therefore the role of a digital librarian is also nebulous, tends to be substantiated by these results.

As referred to in the Statement of the Problem, prior to this survey it was not clear what the educational requirements were to produce effective information professionals to work in the digital library environment. The results discussed above now provide some indicators and direction to assist in determining appropriate education requirements and curriculum inclusions in order to facilitate the development of LIS professionals, confident to work in the digital arena.

In connection with the gap between research and practice, Hallam (2007, p. 1) refers to "the disparate viewpoints that exist between LIS educators and LIS professionals." However, in the main, this has not been evidenced in the study. With the exception of a few specific skills – most notably 'Reflective' (Personal Skills) and 'Ethics and Social Responsibility' (Generic Skills) – practitioners

and educators have quite similar opinions regarding the skills and knowledge required to work in the digital library environment. According to Hallam (p. 17), "LIS education is [….] a critical issue for the profession in its entirety [which] requires concern, cooperation and collaboration…" The similarity of opinion demonstrated in the study can be seen as an important step forward in developing consensus on the shape of the future LIS curriculum.

In conclusion, the significance of this study rests on the anticipation that the empirical data may be used as a starting point to inform decisions on curricula development in LIS programs in Australia. This is significant because if – as concluded by Gerolimos & Konsta (2008) and Marion (2001) – there is no recognised position of "digital librarian" then what is it that is needed to educate information professionals who will work in this digital environment? Additionally, Hallam (p. 1) notes that "[t]he topic of LIS education appears to attract plenty of criticism, but very few constructive ideas to respond positively to the challenges presented." This study could be seen as a positive step towards the challenge of identifying educational requirements for information professionals who will work in this digital library environment in Australia.

REFERENCES

Australian Library and Information Association (ALIA). 2008. *ALIA Education and Workforce Summit*. http://www.alia.org.au/education/summit08/

Australian Library and Information Association (ALIA). 2009b. *Your voice. The ALIA National Advisory Congress 2008*. http://www.alia.org.au/governance/nac/2008/

Choi, Y. & E. Rasmussen. 2006. What Is needed to educate future digital librarians: A study of current practice and staffing patterns in academic and research libraries. *D-Lib Magazine*. 12(9). http://webdoc.sub.gwdg.de/edoc/aw/d-lib/dlib/september06/choi/09choi.html

Feret, B. & M. Marcinek. 1999. The future of the academic library and the academic librarian: a Delphi study. *Library Career Development*. 7(10): 91-107.

Fisher, B. 2004. Workforce skills development: the professional imperative for information services in the United Kingdom. Paper presented at the *ALIA Biennial Conference*, Gold Coast, 21-24 September. http://conferences.alia.org.au/alia2004/pdfs/fisher.b.paper.pdf

Gerolimas, M. & R. Konsta. 2008. Librarians' skills and qualifications in a modern informational environment *Library Management*. 29(8/9): 691-699.

Goulding, A., B. Bromham, S. Hannabuss & D. Cramer. 1999. Supply and demand: the workforce needs of library and information services and personal qualities of new professionals. *Journal of Librarianship and Information Science*. 31: 212-223.

Haddow, G. & J. Klobas. 2004. Communication of research to practice in library and information science: Closing the gap. *Library & Information Science Research*. 26: 29-43.

Hallam, G. 2007. Education for library and information service. In Stuart Ferguson (ed.). *Libraries in the twenty-first century: Charting new directions in information services*. Wagga Wagga NSW.: Centre for Information Studies, Charles Sturt University. http://eprints.qut.edu.au/11674/1/11674.pdf

Hallam, G. 2008. neXus2: *An investigation into the library and information services workforce in Australia: The institutional perspective*. http://www.alia.org.au/employment/workforce

Harvey, R. & S. Higgins. 2003. Defining fundamentals and meeting expectations: Trends in LIS education in Australia. *Education for Information*. 21(2/3): 149-157.

Kennan, M. A., F. Cole, P. Willard, C. S. Wilson & L. Marion. 2006. Changing workplace demands: What job ads tell us. *Aslib Proceedings* 58(3): 179-196.

Khoo, C. 2005. Educating LIS professionals for Singapore and beyond. In J. Tan et al. (eds.). *Celebrating 50 years of librarianship in Malaysia and Singapore*. Kuala Lumpur: Library Association of Singapore. http://www3.ntu.edu.sg/home/assgkhoo/papers/Khoo.LIS_education_for_Singapore.2005.pdf

Lynch, B. & K. R. Smith. 2001. The changing nature of work in academic libraries. *College and Research Libraries*, 62: 407-420. http://www.lita.org/ala/mgrps/divs/acrl/publications/crljournal/backissues2001b/september01/lynch.pdf

Marion, L. 2001. Digital Librarian, Cybrarian, or Librarian with specialized skills: Who will staff digital libraries? Paper presented at the *ACRL Tenth National Conference*. Denver, Colorado. http://www.lita.org/ala/mgrps/divs/acrl/events/marion.pdf

O'Connor, S. & M. Li. (in publication). *Skills for future university librarians*. pre-publication. http://repository.lib.polyu.edu.hk/jspui/bitstream/10397/513/1/Skills%20for%20the%20future%20Tushuguan_26%20June%2008%20final%20revised.pdf

Orme, V. 2007. You will be…: a study of job advertisements to determine employers' requirements for LIS professionals in the UK in 2007. *Library Review*. 57(8): 619-633.

Partridge, H. & G. Hallam. 2004. The double helix: a personal account of the discovery of the structure of [the information professional's] DNA. Paper presented at the *ALIA Biennial Conference*, Gold Coast, 21-24 September. http://conferences.alia.org.au/alia2004/pdfs/partridge.h.paper.pdf

Spink, A. & C. Cool. 1999. Education for digital libraries. *D-Lib Magazine*. 5(5).

Tennant, R. 1999. The most important management decision: Hiring staff for the new millennium. *Library Journal*, 123(3). http://web.ebscohost.com.ezlibproxy.unisa.edu.au/ehost/pdf?vid=5&hid=116&sid=903d34f7-3627-4c3b-806b-5e6b117d0bde%40sessionmgr8

Trochim, William M. 2006. *The research methods knowledge base*. 2nd ed. http://

www.socialresearchmethods.net/kb/sampnon.php

Weech, T. 2005. Analysis of courses and modules: Education for digital librarianship *Proceedings of Digital Library Education*, Villa Morghen

DESIGNING A SPECIALIST POST-GRADUATE QUALIFICATION AND CONTINUING PROFESSIONAL DEVELOPMENT STRUCTURE FOR THE HEALTH LIBRARIAN WORKFORCE OF THE FUTURE

Ann Ritchie, Gillian Hallam, C. Hamill, S. Lewis, M. Foti, P. O'Connor, C. Clark

Through a grant received from the Australian Library and Information Association (ALIA), Health Libraries Australia (HLA) is conducting a twelve-month research project with the goal of developing a system-wide approach to education for the future health librarianship workforce.

The research has two main aims: to determine the future skills, knowledge, and competencies for the health librarian workforce in Australia; and to develop a structured, modular education framework for specialist post-graduate qualifications together with a structure for ongoing continuing professional development.

The paper highlights some of the drivers for change for health librarianship as a profession, and particularly for educating the future workforce. The research methodology is outlined and the main results of the second stage of the project are described together with the findings and their implications for the development of a structured, competency-based education framework.

Corresponding author: Ann Ritchie, Former Library Director, Northern Territory Department of Health & Families. Email: ann.ritchie@alia.org.au

INTRODUCTION

Education and workforce planning are related concepts. Education lays the foundations for the future workforce, and must do so in the context of current and likely future needs of employers. It is critical, therefore, that the two processes are linked through market research and consultation between education providers, employers, and practitioners in the field. Sloan (2008, p. 35) states: 'Strategic workforce development needs to be managed at all levels – professional associations, peak bodies, regional organisations and in the current workforce.' During the period 2006-2008, a major study of the Australian library sector was undertaken, referred to as the ALIA neXus study, to examine the demographic, educational, and workforce characteristics of the sector, viewed from the perspectives of both the individual library professional and the institution as employer (Hallam, 2008; Hallam 2009).

The need for strategic workforce development and, more specifically, the requirement to engage the range of stakeholder groups who have an interest in education and continuing professional development for the future health librarians workforce are the main reasons for undertaking the current research. Until now, there has not been any concerted effort from the health library profession in Australia to map out and implement a structured education framework or to undertake research which could successfully facilitate system-wide consultation and collaboration among the stakeholder groups. The main stakeholder groups are librarians and the organisations in which they are employed, the professional association, educational institutions, and other registered training providers.

Having identified the need to plan effectively for the future, stakeholders in the health library sector in Australia have undertaken this research project to examine the current position of the profession and the anticipated future workforce requirements. Health Libraries Australia (HLA), a sub-group of the Australian Library and Information Association (ALIA), received a small grant from ALIA to undertake the research study. The collaborative project reference group comprises current and past practitioners representing various sectors of the health workforce and employment areas, and members of committees and advisory boards of the Association. The project has two main aims: to determine the future skills needed by the health librarian workforce in Australia; and to develop the structure for a modular education framework for specialist post-graduate qualifications and for ongoing continuing professional development (CPD). The project to date has encompassed an environmental scan and review of the literature, and the collection of data through two web-based questionnaires, an individual survey of health librarians, and an institutional survey of health library managers. The third and final data collection method comprises a set of interviews with 'key informant' employers aimed at exploring their views on the future workplace requirements for health librarians in their organisations. The results will be incorporated into the final report. The project is due for completion shortly, after which a full report will be provided for the consideration of the ALIA Board of Directors and the Health Libraries Australia Executive.

This paper provides an overview of the HLA research project to inform the

development and implementation of a system-wide approach to education for the future health librarian workforce. The research uses 'competency areas' (areas of professional knowledge and responsibilities) to analyse the health librarian skill set. The project is set against the background of some of the major trends in the health sector and the main environmental influences that may act as drivers or enablers for changes in health librarianship as a profession. The international literature about new and emerging roles for health librarians is summarised. This paper focuses on the research results from the survey of health library managers. It provides a detailed analysis of the competencies required for current and future practice, viewed from the perspectives of library managers, at the same time synthesising the findings from these sections of the survey of individual health librarians.

RESEARCH METHODOLOGY

The first stage of the project was to conduct an extensive environmental scan and literature review to develop an understanding of the range of issues in the health sector in Australia and internationally that are likely to have an impact on the role of health library professionals. This was augmented by discussions with health librarians representing various sectors of the profession, and informed the development of the research instruments. Two web-based questionnaires were developed, piloted and distributed to the target groups (health librarians, and health library managers) in the first quarter of 2010. Distribution strategies included a number of professional e-lists as well as email contacts extracted from the National Library of Australia's Australian Libraries Gateway which included 418 self-described health/medical libraries. The first survey, which sought information from individual health librarians in Australia about their educational background and their perceptions of current and likely future needs for professional skill sets in eight competency areas, was conducted in February 2010, and distributed by email. The second survey was distributed to health library managers in March 2010, and asked the same set of questions, seeking their responses about the library unit as a whole. In the latter part of 2010, a series of semi-structured interviews were conducted with survey participants and employers to explore their perceptions of future roles for librarians in the health sector.

The main focus of the questionnaires was to find out what professional knowledge and responsibilities are currently required by staff, and to capture the perceptions of individuals and managers about any likely changes to future roles and responsibilities. The seven-point competency framework developed by the Medical Library Association (MLA) (2007) in the United States (US) was adapted for the questionnaires, with an extra competency area added to solicit information about participants' views with regard to maintaining currency of professional knowledge and practice. The questionnaires also collected background demographic data about the sample population, including composition of the workforce, salaries and budgets, and approaches to staff development. Additional data were collected on the respondents' perceptions about the value of professional development, the preferred methods of delivery

of educational courses and programs, and the extent of support for and barriers to undertaking professional development activities. These results will be included in the final report.

ENVIRONMENTAL SCAN AND LITERATURE REVIEW

The environmental scan together with a review of the literature on the education and development of health librarians in Australia will be discussed in detail in the final report for the project. The principal national trends and influences in the Australian health sector are briefly summarised in this paper to highlight the issues associated with current developments in national health workforce planning, health and hospitals reform, and eHealth initiatives. These issues were reviewed to determine their possible impact on the role of health librarians. In addition, this section highlights some of the new and emerging roles for health librarians which have been discussed in the literature.

National health workforce planning and development

The establishment of a National Health Workforce Taskforce, and a National Clinical Training Authority, together with the move towards national registration for all health professions, provides a model and stimulus for health librarians to follow this trend in strategic workforce planning. With ALIA already operating as the national professional association for librarians, there is an opportunity for health libraries to cooperate in an education initiative that aligns with these national registration, education and training activities. One major challenge is for health librarians to be recognised in the professional health streams, and attract commensurate levels of pay and conditions.

Currently, there is considerable debate occurring in the health information professions in general, and in the area of health informatics in particular, about the core competencies for the field. This provides health librarians with an opportunity to engage in the discussions and to develop their knowledge and skills base in a complementary fashion (NHS Library Services, 2010; Australian College of Health Informatics, 2010; Australian Health Informatics Education Council, 2010). The 'intersection' between the two groups (health informatics and health science librarianship) has been described as an area to be exploited in order to generate new ideas (McKibbon, Eady & Walker-Dilks, 2005; Murphy, 2010). While there are two areas that differentiate health informatics – the focus on information and communications technologies to support and improve healthcare, and the knowledge base which comprises both health and patient information, Murphy (2010:77) suggests that 'the two communities have many shared interests and could benefit from closer collaboration'. There are obvious opportunities to claim or reclaim professional territories from other health information professionals by explicitly identifying the 'scopes of practice' for which health librarians have the knowledge and skills to fulfil the roles.

Health and hospitals reform

A recent Commonwealth Scientific and Industrial Research Organisation (CSIRO) report (2010) has identified five megatrends affecting Australia's future.

The report highlights the ageing population, with concomitant demands on healthcare resulting in increasing rates of healthcare expenditure, as a trend that is likely to continue, with Australians demanding more diversified health services. The report also identifies 'personalisation of services' as a megatrend, and suggests that innovations aimed at tailoring and targeting services will include technologies to help people manage their health information.

The Australian Government's plan to implement the National Health and Hospitals Reform Commission's blueprint for reform (based on the Commission's final report, A Healthier Future for All Australians) was published in July 2009, and agreed to, with some revisions, by the Council Of Australian Governments (COAG) in April 2010 (Department of Health and Ageing, 2010). It remains to be seen how this plan will be implemented, but the intention is to exert more centralised control over the healthcare system with the Commonwealth assuming a greater proportion of hospital funding. It is clear, however, that the funding reforms that are likely to be introduced will affect decisions about the provision of clinical support services such as libraries in the hospital sector, where the greatest proportion of health librarians are employed.

eHealth

The implementation in Australia of the National eHealth Strategy (Australian Health Ministers' Conference, 2008) is a major driver which is likely to affect hospital and primary care librarians, as well as those who work with consumer health information as a primary responsibility. The integration of decision-support knowledge resources at point-of-care with the shared electronic health record will be a significant challenge for health librarians. It will have implications for the roles of librarians as part of multidisciplinary teams, impacting on the provision of expert reference services, with the associated liaison and training activities, as well as on the technical and collection development perspectives of library work. Ritchie (2008:103-104) states that eHealth

> will precipitate the integration of patient care systems, such as the shared electronic health record, with clinical decision-support information tools, consumer health information and other knowledge resources, all requiring customisation at point-of-care. Implementation requires skills to consult with and train clinicians; information professionals will need to know how to manage the content as well as the technology which runs the systems.

To date there has been no centrally coordinated federal government funding for health libraries in Australia, nor for making accessible their collections of health information resources. The National eHealth Strategy's plan to create 'National Health Knowledge Portals' for consumers, healthcare providers and managers has provided an opportunity for an initiative led by the jurisdictions' network of health and hospital libraries. In 2008 the national Chief Health Librarians' Forum (CHLF) was formed to both represent and provide a national forum for the state/territory and federal governments' library/information centres, with representatives from the hospital library sector. One of the objectives of the Forum

was 'to facilitate the work of the jurisdictions' Chief Information Officers in the implementation of the National eHealth Strategy 2008, particularly with regard to the development and provision of content for the National Health Knowledge' (HLA News, 2010:11). The group has presented a strategy for the selection and procurement of knowledge resources to the principal information subcommittee of the Australian Health Ministers' Advisory Council (AHMAC), and has drafted a business case which supports national funding for such an initiative.

New and emerging roles for health librarians

International research reports point to health librarians having to develop new roles and skills as well as enhancing their existing, more traditional skills in response to, or as a result of, trends and issues which are similar to those highlighted in the discussion of the environmental influences in healthcare service delivery and education in Australia. In the United Kingdom (UK) context, the new opportunities for health librarians are discussed in the report Future Proofing the Profession, prepared by the Health Executive Advisory Group to the Chartered Institute for Library and Information Professionals (CILIP) (2004). Opportunities include working beyond the traditional boundaries of the library and contributing to the development of evidence-based healthcare and services. The principal emerging areas of practice for health librarians are summarised as teaching and learning; adopting new roles outside the library with multidisciplinary and cross-sectoral teams; managing knowledge (explicit and tacit) rather than information (documents and data); and developing new information technology strategies to enhance access to quality information (CILIP, 2004:21-23). The Report of a national review of NHS health library services in England (Hill, 2008) envisages a significant expansion of the clinical librarian role and posits the need for around 800 clinical librarians plus a move to Knowledge Services librarians. The report highlights four key purposes for library and knowledge services in the National Health Service: to support clinical decision making; to drive health policy making; to undertake research; and to encourage and support lifelong learning.

In her editorial in a special issue of Reference Services Quarterly, which focuses on the evolving speciality of health sciences librarianship, Shipman (2004:9) states that:

> Emerging roles are surfacing in all arenas served by health sciences libraries: educational, clinical, research, and administration. Librarians are meeting new skill demands by re-educating both on the job and through traditional coursework.

Opportunities in the various fields covered in the journal issue are summarised by Shipman: advances in technology and eHealth, and specifically the presence of electronic patient records 'afford the opportunity for direct information resource integration'; clinical research teams increasingly require additional librarian support to find information and to teach others; in the healthcare practice environment, there is an emerging role for a hybrid health professional dubbed an 'informationist' (having both clinical and librarian knowledge bases) with

potential ability to teach evidence-based medicine and to contribute to problem-based learning teams in a variety of contexts, such as education, research, public health, and consumer health, as well as clinical settings.

In the academic context, Libraryy and Information Science professionals need to be comfortable with research methodologies and to be health information specialists who are able to communicate effectively with researchers (Scherrer, 2004). It has been noted that health information professionals are teaching more, including eLearning programs (Bury, Martin & Roberts, 2006; Steyn & de Weer, 2007; Spooner, 2010). They are engaging in outreach through liaison initiatives, designing and managing electronic information systems, providing consumer health education, while continuing to provide traditional reference services. Beyond this, academic health librarians have always been concerned with how scholarly knowledge is communicated (Webb, Gannon-Leary & Bent 2007) and they are now also developing bibliometric services to measure the research output of their universities (Drummond & Wartho 2009) as part of the research funding processes.

Wilkinson, Papaioannou, Keen & Booth (2009) note that in recent years, the roles of information specialists in three particular areas (the systematic review process, clinical librarianship, and dissemination of research findings) have been extended due to the demands on clinicians to ensure that their practice is evidence-based. They conclude that there is a role for information professionals in this area, with the opportunity to develop new skills to aid the knowledge transfer process. In discussing the establishment of the National electronic Library for Health (NeLH) in the UK, Turner, Fraser, Gray & Toth (2002:134) point to 'an obvious, if ill-defined, role for information professionals' in knowledge management. The authors note that the Pilot NeLH would be one of the main elements of the newly established National Knowledge Service, based around a central website (a core collection) with links to 'commissioned websites' (specialist resources), and that work has entailed 'procurement and licencing'. This establishes NeLH as a knowledge management tool in the domain of collection development and resources management responsibilities.

Clinical librarianship (Harrison & Beraquet, 2009), clinical education (McKibbon & Bayley, 2004), and clinical governance have all been identified as areas of specialist work, with the development and use of clinical guidelines to support evidence-based practice highlighted as areas of increased activity in the future. Holst et al (2009) stress the importance of librarians helping hospitals achieve their 'mission-critical' goals related to clinical care, management of operations, education, innovation and research, and customer service.

> From saving hospitals thousands of dollars per year to saving patients' lives, hospital librarians fulfil many mission-critical roles in today's hospital. These roles include that of expert searcher, educator, community outreach provider, promoter of EBM [evidence-based medicine], information disseminator, effective user of information technology, website manager, patient safety, information provider, and supporter of innovation and research.

Future roles are therefore anticipated in many areas of practice. The surveys of individual health librarians and health library managers in Australia sought to measure the extent to which the competencies were utilised in current practice and to identify the degree of anticipated change.

RESULTS

This summary of the literature has highlighted the need for health librarians to adopt a strong position within the national health professional workforce in order to ensure they are recognised as a professional group with specialist skills and knowledge. The results of the HLA surveys present a picture of the current health library workforce in Australia and contribute to a clearer understanding about the competencies required by those delivering health library services. The present paper provides an overview of the results of the institutional survey, with health library managers/directors as the target cohort of respondents. It should be noted that the preliminary findings from the individual survey have been reported in a separate paper which focuses on the composition and views of the current workforce in health libraries in Australia (Hallam et al: in press).

Results of the institutional survey

From the 77 research participants who accessed the institutional survey, 69 valid responses were collected. As some of these respondents provided only partial responses, the analysis is based on 51 'useable' responses. Initial respondents were spread across all states and territories (Table 1), with results approximating general population proportions. Other factors affecting spread are likely to be the degree of centralisation evident in Australia in the structures governing the state/territory health and hospital sectors, the mix of federal and state/territory government departments, and the presence (or absence) of medical schools in the various state/territory-based universities.

Table 1: Respondents by State/Territory

State/Territory	**Number of libraries**	**Percentage**
New South Wales (NSW)	15	19.5
Victoria (VIC)	11	14.3
Western Australia (WA)	8	10.4
Queensland (QLD)	7	9.1
South Australia (SA)	5	6.5
Australian Capital Territory (ACT)	4	5.2
Tasmania (TAS)	2	2.6
Northern Territory (NT)	1	1.3
No response	24	31.1
Total	*77*	*100.0*

Most respondents were from public sector agencies, with relatively few from the not-for-profit and private sectors (Table 2).

Table 2: Respondents by sector

Sector	Number of libraries	Percentage
Public sector, State/Territory	28	36.7
Public sector, Commonwealth (incl. universities)	11	14.3
Not-for-profit sector	8	10.4
Private sector	1	1.3
Other	4	5.2
No response	25	32.1
Total	*77*	*100.0*

In answering the question about the specific health area served by the library, respondents could choose from 16 categories, and were able to nominate more than one client group; many libraries indicated that they had multiple client groups. Overall, the proportions were similar to those found in the individual survey, with most libraries serving the hospital, academic/research, and government department sectors (Table 3).

Table 3: Respondents by client groups served

Client groups served	Number of respondents	Percent
Hospital	32	41.7
University	18	24.7
Research institute	13	16.9
Government department	10	13.0
Dentistry	7	9.1
Consumer/patient health organization	6	7.8
Health professional assn/college	5	6.5
Pharmacy/drug industry or company	5	6.5
Primary care (GPs, private practice)	4	5.2
Pathology	3	3.9
Health Informatics	2	2.6
Other	6	7.8
Total	*111*	*[145.7]*

In total, there were 111 selections from the 51 survey participants. The largest proportion served hospital clients (42 percent, 32 libraries) and universities (25 percent, 18 libraries), with 13 libraries serving both of these client groups. Research institutes represented 17 percent (13 libraries) of respondents and government department libraries 13 percent (10 libraries). Smaller groups of respondents included dentistry, consumer health, professional association/colleges, pharmacy/drug companies, primary care, pathology, and health informatics. Respondents who selected the option 'other' stated that they served areas such as allied and community health, indigenous health, disability, administration, private complementary/alternative, and health sciences education. It was found

that there was considerable overlap (some client groups were served by more than one library) and various combinations amongst all groups, indicating that, because most libraries serve multiple client groups, librarians have to be flexible with resources and services.

The highest proportion of respondents came from libraries with 2-5 paid staff (47 percent). It is also worth noting that 1 in 5 (20 percent) fell into the category of 'One person libraries', making the majority (67 percent) from libraries with 5 or less staff (Table 4).

Table 4: Number of paid library staff

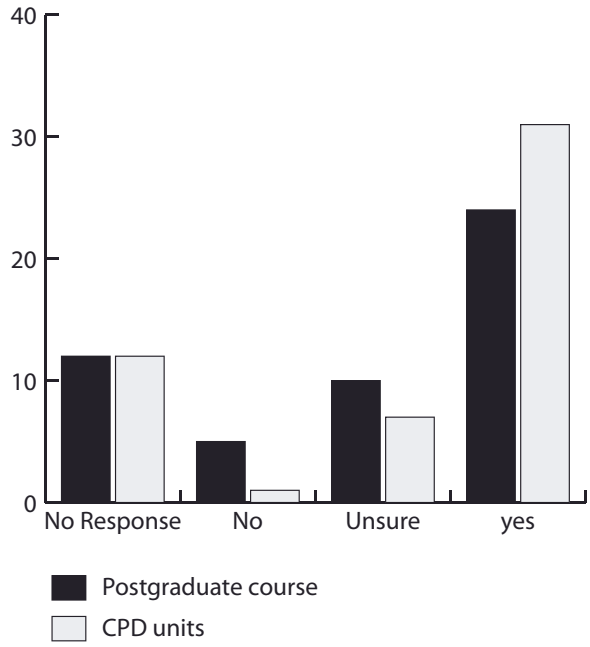
Response	**Number of staff**	**Percentage**
No response	3	5.9
One person (or fraction of one person)	10	19.6
2-5	24	47
6-10	6	11.8
11-20	3	5.9
21-50	1	2.0
50+	4	7.8
Total	*51*	*100*

With regard to composition and diversity of the workforce, the majority (53 percent) had over 90 percent female staff, and less than half (39 percent) of those who responded had staff from culturally or linguistically diverse backgrounds. Only two percent of libraries had staff members who identified as coming from an Aboriginal/Torres Strait Islander background, while 15 percent (eight libraries) reported having one or two staff with a disability.

A number of critical questions were posed about the level of support for formal programs of qualifications and continuing professional development (CPD) units. The first question asked 'If a formal post-graduate specialist course in health librarianship was developed and offered by a university or registered training provider, would your library be prepared to support staff gain the qualification?' Overall, almost half (47 percent) said 'yes', but 10 percent said 'no'; the rest either did not respond or were unsure (Figure 1). All questions invited comments about the responses selected, and some respondents indicated that support for a specialist course would depend on budget, the quality and content of the courses being offered, and delegation to approve such a request. This was summarised neatly by the following response: "Would depend on course content, relevance, cost and demonstrable outcomes".

Respondents were also asked 'If specialist CPD units in health librarianship were developed and offered by a university or registered training provider, would your library be prepared to support your health librarians to upgrade their skills?' In response, 61 percent said 'yes' but 14 percent were unsure. Only one respondent said 'no' (Figure 1).

Figure 1: Support for specialist postgraduate and CPD units in health librarianship



The data revealed that there was slightly more support for CPD units than for a formal postgraduate course, and respondents commented:

> This is more practical than a formal course - I would think it could include things like medical terminology, evidence-based medicine, critical appraisal?
>
> These would be seen as an ongoing requirement and tied in with our formal Work Partnership Plans.
>
> The relevance of any future educational framework will naturally depend on the professional knowledge and skills required for successful practice in any future roles that health librarians undertake.

CURRENT AND FUTURE AREAS OF PROFESSIONAL KNOWLEDGE AND SKILLS

One of the main goals of the research study was to examine the professional knowledge and responsibilities of health librarians with a comparison of current and future perspectives. The questions in both the individual and institutional questionnaires drew on the US Medical Library Association's seven-

point competency framework, with an extra competency area added to solicit information about participants' views about maintaining the currency of their professional knowledge and practice. While the initial findings from the individual survey are reported separately (Hallam et al, in press), the analysis in this section focuses on competency areas and synthesises the 161 responses obtained in the individual survey and the 51 responses from the institutional survey. Taking both perspectives into account has enabled the researchers to continue to build a more comprehensive picture of the likely requirements for educating the future health librarianship workforce.

The three largest groups of respondents in the individual survey were from hospital libraries (96 respondents), government department libraries (25 respondents) and university libraries (24 respondents), while smaller groups of respondents encompassed librarians working in research institutes, primary care, health professional associations/colleges, consumer or patient health organisations, health informatics, pharmacy/drug companies, and commercial publishers. Data from the three largest groups of individual respondents are highlighted in the analysis. As the institutional survey revealed that health libraries often served multiple client groups, it was not possible to review this data from any client-specific perspective. The findings discussed therefore reflect the aggregated institutional data.

The research results presented in this section look at the perceptions of requirements for health librarians for each of the eight areas of the competency framework, both at the current time (Section 4 of the survey) and how these might change in the future (Section 5). While the individual respondents had been asked to rate how much the various competency areas were used in their own roles, the institutional respondents were asked to focus on the library as a whole unit and to rate 'how frequently the health librarians on your staff are actively involved in the following areas of professional knowledge and responsibility'. The categories provided were: 'never', 'rarely', 'sometimes', 'often', and 'very often' (Section 4). On the same set of competency areas, the respondents were asked to rate 'the extent to which you believe that your staff's involvement might change over the next 3-5 years'. Choices ranged from 'decrease significantly', 'decrease to some extent', 'remain the same', 'increase to some extent', to 'increase significantly' (Section 5). Individual respondents (in the first survey) had been asked to respond to the same questions with reference to their own work. Comments were invited in all of the questions. In this article, both groups of respondents' comments (from both surveys) have been included to provide a richer picture and give more insight into the meaning of the ratings data.

Competency 1. Understand the health sciences and healthcare environment and the policies, issues and trends that impact on that environment.

Overall, 67 percent of individual respondents, and 57 percent of institutional respondents reported that they or their staff were 'often' or 'very often' required to understand the health sciences and healthcare environment. The strongest

figures were recorded for individual respondents in the government department category (88 percent) and the hospital category (67 percent), while only 43 percent of university respondents believed that this was the case. Whereas 19 percent of respondents from universities reported that they were 'never' or 'rarely' required to understand the health sciences and healthcare environment, no government department respondents and only five percent of hospital respondents answered 'never' or 'rarely' to the same competency. One respondent indicated that this is an integral part of their role:

> Keep tabs on changes in health policy, issues to do with registration of health professions, government inquiries related to health, nursing, aged care, industrial relations etc. Check daily media for relevant news.

Respondents in all categories expected that an understanding of the health sciences and healthcare environment would increase either 'to some extent' or 'significantly' in the future: 53 percent of institutional respondents and 60 percent of individual respondents reported that this was anticipated, with around 12 percent believing the increase would be 'significant'. In the individual survey the projected increase was more marked in hospitals (79 percent) and in government departments (58 percent), compared with universities (38 percent). Several respondents commented that funding opportunities will require them to be competent in this area:

> Require greater understanding to initiate methods of revenue raising and grant submissions.

Four percent of individual respondents in academic health libraries reported, however, that they expected this competency to decrease significantly in future. Comments provided by institutional respondents generally indicated that this area of professional knowledge and role was the library manager's responsibility. Nevertheless a number of respondents looking to likely future changes in the health sector noted the increasing need for all health librarians to understand the healthcare environment:

> The complexity of the environment and likely changes make me think it is going to be even more important to keep abreast of developments.

Competency 2. Understand the principles and practices related to providing information services to meet user needs.

More than 93 percent of all individual respondents reported that they 'often' or 'very often' needed to understand the principles and practices related to providing information services to meet user needs. Respondents working in hospital libraries (98 percent) and government department libraries (92 percent) recorded a higher response than those working in university libraries (81 percent). Comments indicated that respondents saw this as a core competency:

> This knowledge is essential for the effective management of any library service – it should go without saying.
>
> These are core to our practice.

The institutional perspective was similar, with 80 percent of respondents reporting that their staff were required to understand the principles and practices related to providing information services to meet user needs 'often' or 'very often'. Over half indicated that the competency was 'very often' applied. Comments provided again indicated that this is a core professional responsibility for health librarians:

> All still very much key activities in our library.

It was seen as an evolving domain:

> All these areas have been heavily influenced by change with technology and so the knowledge and responsibilities of all staff have experienced considerable restructure and relearning.

Almost 70 percent of individual respondents and 60 percent of institutional respondents believed that there would be an increase in the application of this competency in the future. Once again, the figures recorded were stronger amongst those working in hospital libraries and government department libraries, compared with those in university medical libraries. Respondents commented that they expected changes in a number of areas, including an increased number of information resources, a wider variety of delivery technologies in clinical and evidence-based practice (EBP) settings, and more significant teaching roles.

Competency 3. Understand the management of health information resources in a broad range of formats.

This competency was widely acknowledged to be important, with 80 percent of individual and 70 percent of institutional respondents reporting that it was applied frequently. Individuals working in government departments (88 percent) reported the highest percentage of 'often' and 'very often' responses, followed by hospitals (84 percent) and universities (71 percent). The ratios recorded for these categories of institutional respondents were in the range of 70 to 75 percent. One individual respondent commented that it was the broad principles that were important in understanding this competency:

> It is not so much the technicalities in these areas that are important as the ability to understand the principles and concepts involved, i.e. understanding what classification is about, how it works, why it's useful etc...

The need for knowledge and responsibility in understanding the management of health information resources in a broad range of formats was expected to increase in the future 'to some extent' or 'significantly' for just over 70 percent of

all respondents, with around three quarters of individuals working in hospitals highlighting the growing need for the competency. A number of comments noted that the shift from print to electronic resources, along with the associated issues of digital repositories, licensing, copyright, web publishing, and the implementation of new standards, required a new range of skills within the competency area. The management of digital content was highlighted as an important and increasing area of professional responsibility for health librarians. Institutional respondents noted:

> Some of these issues have required a much higher level of knowledge and responsibility and have resulted in recognition by reclassification to a higher grade reflecting that advanced scope of practice.

> Repository management for electronic publications is likely to increase for a number of librarian roles and resource formats and types e.g. managing policies and guidelines, managing the department's digital repository, managing an eLearning repository.

Competency 4. Know and understand the application of leadership, finance, communication, and management theory and techniques.

The perceived application of this competency was notably lower, with just under half of individuals (48 percent) and institutional (43 percent) respondents reporting that this was needed frequently. This suggested that the competency was perceived to fall under the responsibilities of managers rather than staff. While 24 percent of individual university respondents reported that they 'rarely' or 'never' needed to know and understand the application of leadership, finance, communication, and management theory and techniques, the results were even lower for respondents working in libraries in hospitals (14 percent) and in government departments (13 percent). Nevertheless, some comments indicated that these skills were important:

> I couldn't manage 2 libraries and lead a team without good skills in these areas. Obviously they are essential for any manager and, at some level, for any librarian.

Over half of all individual respondents expected that their own knowledge and understanding in this competency was likely to increase. This was higher than the recorded views of the library managers, with only 42 percent believing that their staff would be required to apply these skills to a greater extent in the future and 37 percent indicating there was unlikely to be any change. Some respondents were aware of the strategic nature of the competency:

> The library has to continually prove itself to be relevant; have to ensure fit with organisational priorities, and strive for better marketing opportunities.'

Institutional respondents reported that this area of professional knowledge and responsibility was largely confined to library managers, while noting, however,

that 'all staff are involved in strategic planning and projects' and therefore required leadership, finance, communication and management skills to a certain extent. Looking to the future, respondents commented:

> In tough times, marketing and public relations and review and evaluation are a high priority.

> Strategic approaches to collection development, financial management, evaluation, and policy are becoming increasingly important for these roles as budgets remain stable and student and faculty expectations increase.

Competency 5. Understand and use technology and systems to manage all forms of information.

Overall, 81 percent of individual respondents and 67 percent of institutional respondents indicated that they 'often' or 'very often' needed to understand and use technology and systems to manage all forms of information. Comments noted the wide range of technologies used in libraries, including databases (creation, management and access), web technologies (eg. RSS feeds) and learning management systems.

In terms of the future, individual respondents expressed a stronger belief that the requirement for technological competencies would increase, with 82 percent indicating that there would be an increase 'to some extent' or 'significantly', compared with 69 percent of library managers. No respondents identified this as an area where there would be a decreased need for knowledge and responsibilities. The comments provided stressed that it was critical for libraries to keep up with new technologies, especially mobile technologies:

> I expect that the reliance upon technology will continue to increase – especially mobile technology – and I hope to become more familiar with it and more aware of the possibilities.

One respondent summed up the current and future roles of health librarians in relation to the use of technology to manage information as follows:

> Everyone uses technology now as an information management tool. The focus on the subject content and providing access through high quality metadata needs to be reinforced, not allowing the technology to become the focus. Working with systems that allow collaboration with clients and interactivity will increase.

Competency 6. Understand curricular design and instruction, and have the ability to teach ways to access, organise and use information.

When considering the current requirements for an understanding of curricular design and instruction, and the ability to teach ways to access, organise and use information, there were clear differences between the various categories of health library. Seventy-six percent of individual respondents working in the

academic sector reported that they were 'often' or 'very often' required to apply this competency area, compared with 55 percent of those in hospital libraries and 33 percent of those in government department libraries. Indeed, almost one third of respondents in government departments reported that they 'rarely' or 'never' required this knowledge. Comments reflected the distinctive viewpoints of academic librarians and government department librarians:

> [I have] responsibility for developing all information literacy programs and for delivering some of them.

> I do not engage in training/education of the wider hospital population. That is the responsibility of the network library system.

Two thirds of individual librarians in academic libraries and hospital libraries reported that they expected future involvement in curricular design and teaching to increase 'to some extent' or 'significantly'. A typical comment was:

> As clinicians do more of their own searching for information, they will need more instruction on searching effectively. I think there will be an increasing need for information literacy training.

Half of all library managers reported that their staff were currently required to have professional knowledge and responsibilities in this competency area 'often' or 'very often'. There was a keen awareness that the need to utilise skills in the area of curricular design and instruction was likely to increase 'to some extent' or 'significantly', with around 63 percent of library managers reporting the anticipated growth. It was noted that the institutional respondents representing the smaller libraries were less likely to see any increase in this area.

Comments received highlighted the fact that most health librarians did not generally have formal training in teaching skills, despite the fact that information literacy training represents an increasingly important part of the future professional skill set. One respondent observed:

> This is an area that would benefit from a more focused and formal approach to learning from staff.

Several respondents identified eLearning as 'an emerging area of interest' with one respondent noting:

> eLearning strategy implementation and the library's increased responsibilities in this functional area will require better understanding of formal teaching and learning processes, and increased skills, knowledge in this area. This will be not only regarding health information literacy skills, but also how to work in multidisciplinary eLearning development and delivery units, to ensure that the library's knowledge base is integrated with all teaching and learning programs.

Competency 7. Understand scientific research methods and have the ability to critically examine and filter research literature from many related disciplines.

The competency encompassing the understanding of scientific research methods and the ability to critically examine and filter research literature from many related disciplines was reported as being 'often' or 'very often' required by around 40 percent of respondents in both the groups of individuals and library managers. Interestingly, the figure was lower for individuals in government department libraries (33 percent) than for library managers in government departments (60 percent). Current involvement was reported as 'rarely' or 'never' by 19 percent of university respondents, 23 percent of hospital respondents and 38 percent of government department respondents. The comments were principally provided by individual respondents who felt confident about their skills in this area and emphasised the importance of evidence-based practice and research methodology training in developing these skills.

Generally, around 60 percent of individual respondents and 50 percent of institutional respondents believed there would be an increased demand for these research skills in the future. Two typical comments were:

> Expect local research to increase significantly and therefore library involvement.

> Will need to become more proficient in these areas as library services become more clinical.

Future likely decreases in the need for these skills were reported at less than five percent across all categories. It is interesting to note that future involvement in this competency was less keenly anticipated in the more traditionally 'research' context of academic libraries than in government departments. Respondents' comments were divided between regarding an understanding of scientific research methods as essential to reference work in health libraries versus regarding critical appraisal as the responsibility of the clinician or researcher rather than the librarian. Looking to the future, one respondent noted:

> Over the next 5-10 years, libraries will continue to expand their role beyond that of gatekeepers or information providers, adding analysis, synopsis, and evaluation of the literature to their services more than ever before. So an emphasis on quality will mean that evaluation skills are essential.

Another respondent commented on the future requirement to apply critical appraisal skills to evaluation of the library and information science literature, stating that it would be necessary for health librarians 'to understand and implement qualitative and quantitative research methodologies for improving service delivery as well as measuring impact of library services'.

Competency 8. Maintain currency of professional knowledge and practice.

More than 60 percent of individual respondents in all categories reported that they were 'often' or 'very often' required to maintain currency of professional knowledge and practice. This was higher in government departments (71 percent) than in universities (62 percent) and hospitals (59 percent). Slightly lower figures were captured for institutional respondents (57 percent). Around nine percent of individual academic library respondents reported that, for them, this was 'rarely' or 'never' a current requirement. Comments identified a wide range of different types of professional development (e.g. blogs, conferences, personal contacts, participation in professional organisations), while some commented on lack of funding and other limitations.

> It is difficult to obtain approval to attend conferences and workshops due to costs of airfares. There are limited local opportunities.

Around half of all individual and institutional respondents reported that they expected that the need to maintain currency of professional knowledge and practice would not change in the future, while an anticipated increase 'to some extent' or 'significantly' was reported by 56 percent of hospital respondents and 50 percent of government department respondents and university respondents.

Respondents' comments reflected the importance of maintaining currency of professional knowledge and practice, both now and in the next three to five years:

> Will always be important.

> Critical if we are to remain relevant.

DISCUSSION

Overall, results from both surveys for Sections 4 and 5 examining the current and likely future areas of professional knowledge and responsibilities were fairly homogeneous, with most institutional respondents believing that the involvement of their staff in these competency areas would increase. This can be interpreted as amounting to doing 'more of the same'. The comments provided by respondents revealed some interesting trends with regard to role development and emerging new roles, which are aligned with discussion presented in the environmental scan and literature review.

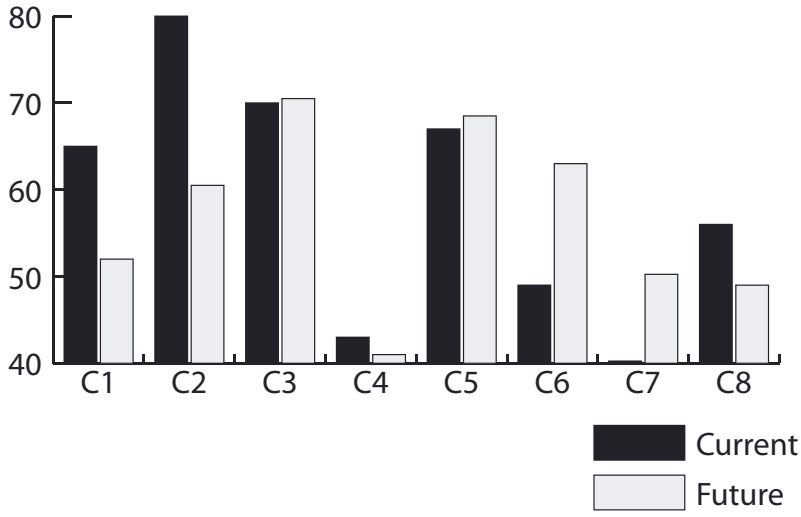
Regarding current knowledge and responsibilities, 66 percent or more of institutional respondents reported their health library staff were 'often' or 'very often' required to have professional knowledge and responsibility in three competency areas:

- C2: providing information services to meet user needs (80 percent)
- C3: managing health information resources in a broad range of formats (70 percent)

- C5: understanding and using technology and systems to manage all forms of information (67 percent)

Regarding likely future roles in the next three to five years, 60 percent or more of institutional respondents predicted that there would be an increase or a 'significant' increase in the knowledge and responsibilities of their health library staff in the same three areas as above (C2, C3 and C5), with the addition of a further area – understanding curricular design and instruction (C6) (Figure 2).

Figure 2: Areas of competency: current and future requirements (institutional respondents)



It is interesting to note that the literature review highlighted new and emerging roles in three of these four areas of competencies: tailored reference services, e.g. clinical librarian's role (providing information services to meet user needs) (C2); advances in technology and systems (C5); and teaching role (understanding curricular design and instruction) (C6). The literature did not reveal any anticipated new roles in developing and managing collections i.e. 'managing health information resources in a broad range of formats' (C3), although this area may have been subsumed in an emphasis on electronic formats and a focus on the technology area (C5). These topics can be examined more extensively in the forthcoming semi-structured interviews with selected survey respondents and employers.

CONCLUSIONS

The picture of the health library workforce reveals a mature demographic engaged in a relatively stable profession. Health librarians are predominantly

employed in small libraries (67 percent with five or less staff), with many of these in the hospital sector, while smaller proportions serve the academic/research and government department client groups. There are also a range of libraries serving quite diverse, but specialised, client groups. These smaller groups may also be involved in direct clinical care or public/community healthcare service delivery, as well as various health/medical education and research activities. It is acknowledged that this diversity will inevitably mean that there may be some differences in the requirements of these groups relating to the content of any future educational offerings.

In Australia, health librarians who hold science degrees or those who have transferred from a career in the health sciences, such as nursing or veterinary science, to that of librarianship, and who, therefore, bring contextual knowledge and skills to add to the professional knowledge and skills attained while completing their LIS qualification are not rare. The survey of individual health librarians recorded 51 university qualifications and 10 vocational qualifications in the area of science/health/medicine, from undergraduate degrees (17 percent) through a range of post-graduate qualifications. It has been noted that between 60-70 percent of special librarians responding to the WILIS survey in the US indicated that libraries of the future are likely to hire more subject specialists with advanced degrees (Barreau, Marshall & Rathbun-Grubb, 2009), which can feasibly be achieved through a Bachelor's degree in the field of science/health/medicine and Master's degree in LIS.

Respondents to the individual survey were asked to consider a range of issues relating to continuing professional development and these results have been reported in a separate article (Hallam et al., in press). While 67 percent of respondents indicated that their employer supported professional development activities, only 15 percent agreed that their organisation offered financial incentives for such activities. The comments in the institutional survey generally concur with these observations about employer support. Barriers to CPD participation included time, distance (particularly an issue for regional or rural health librarians in Australia), and cost. Nevertheless, the research has revealed a strong commitment to CPD (80 percent), with almost half of the respondents supporting the notion of compulsory CPD.

In general, the attitudes to and the level of support expressed in the institutional survey for a both a specialist course in health librarianship and an ongoing CPD program were fairly similar. The twin requirements for relevance and quality were emphasised, and it was noted that any potential support from the profession would also depend on what was offered, the applicability to the program to the workplace, and the cost. It was recognised that the framework for a specialist health librarian qualification and ongoing professional development program should encompass both generalist and specialist skills. Others have made similar discoveries with regard to the quality of course offerings and the barriers to participation in online learning programs. Some valuable work has been done in the UK which draws on the experiences of a group of health librarians from Sheffield University who have developed the FOLIO courses. Booth et al (2009) conducted a systematic review of workplace-based eLearning courses, finding

that the barriers of 'lack of time and geographical isolation' were encountered by many in the health services. In designing online courses, the authors emphasised the importance of focusing on the quality of the learners' experience, which they characterised as relating to course presentation and design; flexibility; peer communication; support; and knowledge validation.

A large amount of data has been collected through the HLA research project. This paper has presented the main results from the institutional survey of library managers, and incorporated some of the findings from the individual survey. The analysis of the data gathered in the core sections of the surveys has enabled the research team to gain insights into the current areas of professional knowledge and responsibilities that characterise the work undertaken by health librarians in Australia, and has provided some comparative information about the anticipated future competencies. This information will be enriched through the series of semi-structured interviews with employers. A comprehensive analysis of the project will be presented in the final research report, to form the basis for discussions with stakeholders – practitioners, employers, educators, and professional bodies – to design an educational program that will not only meet the immediate workforce needs for health librarianship, but also help strengthen the position of health librarians by preparing them for new roles in the sector.

REFERENCES

Australian College of Health Informatics (ACHI). 2010. *Home page*. http://www.achi.org.au/

Australian Health Informatics Education Council (AHIEC). 2010. *Home page*. http://www.ahiec.org.au/

Australian Health Ministers' Conference. 2008. *National e-health strategy: A summary*, Victorian Department of Human Services, on behalf of the Australian Health Ministers' Conference, Canberra. http://www.ahmac.gov.au/cms_documents/National%20E-Health%20Strategy.pdf

Barreau, D., J. G. Marshall, & S. Rathbun-Grubb. 2009. *The changing terrain of special librarianship: A report from the Workforce Issues in Library and Information Science (WILIS) study.* Proceedings of the Special Library Association Annual Conference, Washington, DC. http://www.sla.org/pdfs/sla2009/WILIS_SLApaper.pdf

Booth, A., C. Carroll, D. Papaioannou, A. Sutton & R. Wong. 2009. Applying findings from a systematic review of workplace-based e-learning: implications for health information professionals. *Health Information and Libraries Journal*. 26: 4-21.

Bury, R., L. Martin & S. Roberts. 2006. Achieving change through mutual development: supported online learning and the evolving roles of health and information professionals. *Health Information and Libraries Journal*. 23 (Suppl. 1): 22-31.

Chartered Institute of Library and Information Professionals (CILIP). 2004.

Future proofing the profession: report of the Health Executive Advisory Group to the Executive Board of CILIP. London: CILIP. http://www.cilip.org.uk/get-involved/policy/statements/historical-reports/Pages/futureproofprof.aspx

Commonwealth Scientific and Industrial Research Organisation (CSIRO). 2010. *Our future world: an analysis of global trends, shocks and scenarios*. compiled by S. Hakjowicz and J. Moody. http://www.apo.org.au/node/21864

Department of Health and Ageing. 2010. *The state of our public hospitals: Report. June 2010*. http://www.health.gov.au/sooph10

Drummond, R. & R. Wartho. 2009. RIMS: the Research Impact Measurement Service at the University of New South Wales. *Australian Academic & Research Libraries*. 40(2): 76-87.

Hallam, G. 2008. *neXus: an investigation into the library and information services workforce in Australia. Report prepared for ALIA*. http://www.alia.org.au/employment/workforce/

Hallam, G. 2009. *neXus2: a research project to examine the workforce planning and staff development policies and practices in Australian libraries. Report prepared for the ALIA and NSLA*. http://www.alia.org.au/employment/workforce/

Hallam, G., A. Ritchie, C. Hamill, S. Lewis, C. Newton-Smith, M. Kammermann & P. O'Connor. (in press). Australian health libraries - a research-directed future. *Library Trends*.

Harrison, J. & V. Beraquet. 2009. Clinical librarians, a new tribe in the UK: roles and responsibilities. *Health Information and Libraries Journal*. 27(2): 123-132.

Hill, P. 2008. *Report of a national review of NHS health library services in England: from knowledge to health in the 21st century: National Library for Health*. http://www.library.nhs.uk/nlhdocs/national_library_review_final_report_4feb_081.pdf

HLA News. 2010. What is this thing called CHLF?? *HLA News*. March 2010, p. 11. http://membership.alia.org.au/lib/pdf/groups/hla/HLA.News-March2010.pdf

Holst, R., C. J. Funk, H. S. Adams, M. Bany, C. M. Boss, B. Hill, C. B. Joseph & R. K. Lett. 2009. Vital pathways for hospital librarians: present and future roles. *Journal of the Medical Libraries Association*. 97(4): 285-292.

McKibbon, K. A. & L. Bayley. 2004. Health professional education, evidence-based healthcare, and health sciences librarians. *Reference Services Review*. 32(1): 50-53.

McKibbon, K.A., A. Eady & C. J. Walker-Dilks. 2005. Research, development, and production of information resources and tools. *Reference Services Review*. 33(1): 25-30.

Medical Library Association (MLA). 2007. *Competencies for lifelong learning and professional success*. http://www.mlanet.org/education/policy/

Murphy, J. 2010. Health science librarianship's legacy to health informatics. *Health Information and Libraries Journal*. 27: 75-79.

National Health and Hospitals Reform Commission. 2009. *A Healthier Future for All Australians: Final Report. June 2009. Executive Summary*. Canberra: Commonwealth of Australia.

National Library of Australia. 2010. *Australian Libraries Gateway*. http://www.nla.gov.au/apps/libraries

NHS Library Services. 2010. *NHS knowledge and skills framework*. http://www.libraryservices.nhs.uk/forlibrarystaff/staffdevtandsupport/knowledgeandskillsframework/

Ritchie, A. 2008. *Future visions for Continuing Professional Development in health librarianship: an Australian perspective. Health Information and Libraries Journal*. 25(Suppl. 1): 100-102.

Scherrer, C. S. 2004. Reference librarians' perceptions of the issues they face as academic health information professionals. *Journal of the Medical Libraries Association*. 92(2): 226-232.

Shipman, J. P. 2004. Why emerging roles for health sciences librarians? *Reference Services Quarterly*. 32(1): 9-12.

Sloan, J. 2008. Avoiding the crunch at crunch time. *Australian Library Journal*. 57(1): 33-38.

Spooner, G. 2010. *CPD, education and national registration for nurses*. ALIA Health elist posting, 23 June, 2010.

Steyn, C. & J. A. de Weer. 2007. The naked librarian: health librarians in the modern era. *Library Review*. 56(9): 797-802.

Turner, A., V. Fraser, J. A. M. Gray & B. Toth. 2002. A first class knowledge service: developing the National electronic Library for Health. *Health Information and Libraries Journal*, 19(3): 133-145.

Webb, J., P. Gannon-Leary & M. Bent. 2007. *Providing effective library services for research*. London: Facet Publishing.

Wilkinson, A., D. Papaioannou, C. Keen & A. Booth. 2009. The role of the information specialist in supporting knowledge transfer: a public health information case study. *Health Information and Libraries Journal*. 26(2): 118-125.

Reviews

The Lessons Learned Handbook: Practical Approaches to Learning from Experience

Nick Milton Oxford Chandos 2010 191p ISBN 9781843345879 £45.00

Dr Nick Milton is a director of a knowledge management consultancy in the U.K. and has been a guide, coach, and trainer in knowledge management for 18 years.

The Lessons Learned Handbook encourages knowledge, project, and other managers to set in place a 'lessons learned' system for enabling learning from experience within their organisations. Valuable case histories of real-life events pepper the chapters, which systematically outline and summarise all the key steps and alternatives in the process in a clear, easy-to-read manner.

Large companies, such as BP and Ford, who operate worldwide, have much to gain by sharing their 'lessons learned' widely, and even globally, but I wonder whether this would be as useful an approach for libraries. Perhaps a 'learning from experience' system would work if a Community of Practice wiki were used, as discussed in the interview in chapter 15, 'Wikis as part of a learning system; an interview with Peter Kemper'.

A clever inverse summary of the Handbook's ideas is found in the section called 'How not to learn lessons' – 100 ways to destroy lesson learning. This includes such gems as 'Learn only from mistakes. Why learn from success? You know you'll never repeat it!' and 'Don't tell anyone when processes have been updated, this would spoil the surprise.' An extensive index is included, but only a few references appear at the end of chapters.

One of the book's weaknesses is the lack of information about the author, Nick Milton, and the sketchy information about the writers of the specialist chapters on 'Safety investigations', 'Learning lessons in networks', and 'Wikis'. All the chapters have the potential to be useful to readers, but the authority of the writers is not established.

Janet Bailey

Petersham College, TAFE NSW

Information Literacy in the Digital Age: An Evidence-based Approach

Teresa S Welsh and Melissa S Wright Oxford Chandos 2010 204 pp ISBN 9781843345152 pbk £47.00

Information literacy is an area of constant growth and development. In the digital age, where the most valuable currency is often relevant information, there is a high demand for people who can efficiently and effectively locate, access, critically evaluate, and deploy information to solve the problem at hand. Thus, librarians and other information professionals are often required to provide training in 'information literacy' in tertiary settings.

Information Literacy in the Digital Age: An Evidence-based Approach provides information practitioners with a 'one stop shop', describing the multitude of discrete components that comprise the larger umbrella term of information literacy. These include cultural literacy, library literacy, ethical literacy, network literacy, computer literacy, media and visual literacy, government literacy, and financial literacy. The book also examines the communication skills required to share this information with others. Additional appendices include a useful Information Competency Assessment Instrument and several pertinent research papers that support key concepts.

Welsh and Wright's extensive experience and numerous qualifications in the areas of library and information science are evident in the depth in which they have researched this wide-ranging book. However, while each individual chapter is clearly organised, the book does not have an explicit purpose. Although the first chapter, titled 'What is Information Literacy?', outlines in some detail the origins of the term and some useful definitions and models used to describe the concept, there is no framework or lens for examining each of the literacies. Each chapter identifies and explains a particular literacy, yet the links that these literacies have in supporting the development of information literacy are not clearly drawn. The conclusion neither draws the book to a close nor extrapolates on the uses of the information the book presents.

In addition, there seems to be some confusion as to the intended audience. Although some chapters appear to have been written for professionals teaching information literacy, others are more geared to students. Research exercises at the end of each chapter, and the final chapter, 'Writing a research paper' reinforce the notion that it is a text designed for students of information literacy, rather than teachers of it.

Information Literacy in the Digital Age is a useful guide for anyone wishing to enhance their understandings of particular literacies, but is best used as an introduction to further exploration in each individual area – the whole is less than the sum of its parts.

Kay Cantwell

Education Officer: ResourceLink, Brisbane Catholic Education

Humanism and Libraries: An Essay on the Philosophy of Librarianship

André Cossette Duluth Minn Library Juice Press 2009
79 pp ISBN 97819351178 pbk US$15.00

This little work is an unusual didactic venture by Rory Litwin, the energetic publisher of the Library Juice Press. On this occasion he also acts as translator and annotator. The late André Cossette originally prepared his work as part of an academic program in library science at the University of Montreal. It was subsequently published in French in 1976. Litwin's preface explains why this work is worth translating and issuing in a world vastly different from the author's era. Cossette's concern is with the philosophical basis of librarianship: that is, librarianship 'with a clear sense of identity and purpose' (x). His writing is, in Litwin's estimation, still relevant and timely to the American and British streams of librarianship. His eloquent preface and fluent translation encourage us to take seriously what might seem on a passing glance to be out of time and place.

Part 1, entitled 'Concepts and problems in the philosophy of librarianship' (pp.3-28) and Part 2, entitled 'Elements of the philosophy of librarianship' (pp.29-65), comprise the text proper. Here, views of writers such as J. Periam Danton and many others are analysed. Litwin also adds a list of didactic 'Questions for reflection' (pp.63-65). Question 7 asks, for instance: 'Is there a link between the status of librarians and the existence (or non-existence) of a philosophy of librarianship?' If only we knew the answer! This little book is meant for reflective librarians and for use in library schools. It offers a chance to look again at intellectual struggles from decades ago and still unsolved. It makes intriguing and challenging reading.

R. L. Cope

Leading from the Middle, and other Contrarian Essays on Library Leadership

John Lubans Jr Santa Barbara CA Libraries Unlimited
2010 299pp ISBN 9781598845778 pbk US$50.00

John Lubans Jr. has a long career in librarianship, both practical and as author. The present compilation adapts pieces originally published over 15 years in Library Leadership & Management 'to advance a theory of collaborative and empowering leadership' in libraries. His writing has the robustness of a Theodore Roosevelt and his approach is reminiscent of Dale

Carnegie. Leadership and self-realisation are principal concerns he follows just as easily in baseball and airlines as in symphony orchestras (where he singles out Simone Young for an appreciative appraisal). He is eclectic in his examples, and Australia, which he has visited, provides its share. His vigorous personality is reflected in an easy flowing conversational style. He is an entertaining writer and the word 'contrarian' seems an excellent term to convey his approach to management theories and practice. He is fond of asking 'why?'. Cesar Millan, the dog-whisperer, also attracts his attention.

The book has 36 chapters, divided into four parts. His themes range far and wide: teamwork and leadership predominate in part one; part 2 concentrates on leaders and values. Part 3 looks at coaching, self-management, collaboration and communication, and Part 4 is given to techniques and tools, productivity, and climate. Snappy titles for chapters are another of the author's strengths; photos are used in some chapters. The collection allows the reader to enter the text at any point and the work is good for browsing too. It is mostly applied psychology used to illustrate perennial problems in motivation and personnel and organisational management, not only in libraries.

Whilst there is a certain chattiness throughout and a sense of repetition, this work is not just all froth and bubbles. It exemplifies the 'can do' approach Australians associate with a Bob Ansett figure. One can learn some lessons from this book, which is stimulating rather than profound. Most librarians would read it with a smile and raise a few questions about the personality types librarianship seems to attract.

R. L. Cope

Wikis for Libraries (Tech Set no.5)

Lauren Pressley London Facet 2010 101pp ISBN 9781856047258 £34.95

Wikis are becoming known as powerful tools that enable collaboration and communication within an internal or external community. *Wikis for Libraries* aims to help librarians and libraries of all types join this wiki revolution. It does so by providing guidance on how to plan, implement, market, and measure the success of a wiki in your library, as well providing some tips on best practice. The book is also supported by a wiki: http://techset.wetpaint.com/page/Wikis+for+Libraries-+Lauren+Pressley.

Pressley provides authoritative and easy to follow advice into wikis and how libraries can take advantage of them. Topics covered in include: choosing wiki software, determining the purpose of your wiki, getting staff buy in, developing internal/external wikis, starting your wiki, marketing to your intended audience, maintaining your wiki, outlining the implementation steps, having a preservation plan, and the wiki becoming a part of the library culture. The ideas presented for

wiki uses in libraries are varied and cover possibilities to suit all library types from internal ideas such as intranets, knowledge bases, and facilitated collaboration spaces and external ideas such as a web site, event pages, subject guides, online resources, and wikis for teaching and instruction.

The examples are all based in the United States, though overall the whole work is of use to an international audience and not just an American one. Although wikis are a part of the social revolution on the Internet that is Web 2.0, you may find it harder to sell a wiki to your organisation as 'they are not understood by as many people' (p. 76). This book will help solve that problem and more, by helping you to clarify exactly what wikis can be used for and how they can be marketed to stakeholders effectively.

If you are thinking about implementing a wiki in your library but don't know where to start or what wiki could do for your library, then this book is for you.

Emma Datson

Australian Taxation Office

Library and Information Science Research in the 21st Century: A Guide for Practising Librarians and Students

Ibironke O. Lawal Oxford Chandos 2009 192pp ISBN 978-1-84334-372-1 pbk £47.00

In the landscape of Evidence Based Library Practice (EBLIP), *Library and Information Science Research in the 21st Century* is a timely book, designed for both practising librarians and library students as a whistle-stop tour of the research process.

Ibironke O. Lawal has experience both in engineering and science librarianship, and as an academic in Library and Information Science. Her initial research expertise was supported by a doctoral degree in education. She identified a gap in her own library education with regard to research skills, and notes these as lacking across the industry, prompting this book. Arguments are presented for the importance of both conducting and critiquing research in librarianship, for the introduction of more research training into library courses, and research for advancing the profession in the changing world.

Lawal captures the research cycle for librarians. This is couched in the context of the library training development as librarianship moved from a vocation to a young profession, and in the tendency of librarians towards collecting descriptive information without sufficiently analysing it. She follows a logical progression from the importance of research and identifying substantial research questions,

through to research methodologies and data analysis, and the publication process.

Several good suggestions are provided for the development of research, and the philosophy surrounding research purpose is engaging. The coverage of research design (both qualitative and quantitative research), data collection, and data analysis is concise, but gives a good initial overview of options for the budding researcher to follow up.

Loose writing and editing creeps in through the later chapters. The main fault, however, lies in the lack of information on applying research to practice. An additional chapter could have addressed this.

Overall, Lawal provides some interesting thoughts on the direction of the profession if research is not conducted, critiqued, and applied. Further reading from the extensive reference list will be required for any practitioner who wishes to apply themselves to research.

Fiona Russell

Monash University

Introduction to Modern Information Retrieval, 3rd Edition

G G Chowdhury London Facet 2010 508pp ISBN 9781856046947 £44.95

G.G. Chowdhury is a Professor in the Information and Knowledge Management programme in the Faculty of Arts and Social Sciences at the University of Technology Sydney. This third edition of his book, *Introduction to Modern Information Retrieval*, is a textbook aimed at library and information studies students, and information practitioners.

The full gamut of information retrieval is covered, through explanations of database technologies, bibliographic formats, cataloguing and metadata, subject analysis, vocabulary control, abstracts, and indexing to user interfaces, evaluation of IR systems, and IR in a web context. Professor Chowdhury has been ambitious to cover such a wide area in 500 pages. On the whole, the book achieves its aims, but there are a couple of areas which could be improved. For instance the text is meant to be from a 'relatively non-technical' (p.xi) point of view, but there are several places where technical terms such as 'instantiation' (a term from object-oriented programming) and 'normalization of data' are used and not defined. The publishers of the book have let readers down by including screen shots which are so small as to be un-readable.

Disappointingly, some of the content in the text is dated. For instance, databases on CD-ROM are given much greater prominence than they have in 2010 in real

life, when compared to web-based databases 'in the cloud', and MARC tag 440 is described as current when it became obsolete in 2008.

The text has some good explanations of current initiatives such as FRBR. Some other developments in IR, such as the emergence of pre-indexed services like Serials Solutions' Summon, are not yet incorporated into the text. A related important issue to information retrieval affecting academic libraries is the authentication of users against cloud-based licensed electronic library resources and initiatives such as Shibboleth and Australian Access Federation (AAF) which will help with authentication. It would be useful to have this also incorporated into a new edition of Chowdhury.

This text is written from quite an 'academic' perspective, and undergraduates would need support to work through all the concepts of the text. The text will be of great use to information practitioners to review their IR knowledge, and bring it up-to-date in many areas.

Di Worth

University of Tasmania

Publications received

Building a digital repository program with limited resources
Abby Clobridge. Oxford: Chandos, 2010.
ISBN 9781843345961 pbk 239pp £47.00

Digital curation: A how-to-do-it manual
Ross Harvey. London: Facet, 2010.
ISBN 9781856047333 pbk 225pp £44.95

The future of archives and recordkeeping: A reader
Jennie Hill, ed. London: Facet, 2011.
ISBN 9781856046664 pbk 244pp £49.95

An overview of the changing role of the systems librarian: systemic shifts
Edward Iglesias, ed. Oxford: Chandos, 2010.
ISBN 9781843345985 pbk 117pp £42.50

Collections, characters and communities: The shaping of libraries in Australia and New Zealand – papers from the Ninth Australian Library History Conference, Swinburne University, Prahran, 26-27 June 2009
B.J. McMullin, ed. Melbourne: Australian Scholarly Publishing, 2010. ISBN 9781921509612 pbk 187pp AUD$29.95

Books, bytes and business: The promise of digital publishing
Bill Martin and Xuemei Tan. Farnham, Surrey: Ashgate, 2010. ISBN 9780754678373 hbk 279pp £60.00

Introducing RDA: A guide to the basics
Chris Oliver. London: Facet, 2010.
ISBN 9781856047326 pbk 117pp £29.95

Australian book collectors
Chares Stitz, ed. Bendigo: Bread Street Press, 2010.
ISBN 9780646533407 hbk 322pp AUD$95.00

Early printed books as material objects: Proceedings of the conference organized by the IFLA Rare Books and Manuscripts Section, Munich 19-21 August 2009
Bettina Wagner and Marcia Reed, eds. IFLA Publications no. 149. Berlin: De Gruyter Saur, 2010. ISBN 9783110253245 hbk 367pp €99.95

Gatekeepers of knowledge: A consideration of the library, the book and the scholar in the Western World
Margaret Zeegers and Deirdre Barron. Oxford: Chandos, 2010.
ISBN 9781843345053 pbk 134pp £45.00