NO END IN SIGHT – INFORMATION SKILLS FOR ACADEMICS AND RESEARCHERS

ABSTRACT

This paper follows the genesis, development and delivery of Knowledge Management seminars aimed at academics and researchers in the university environment who, although they are life long learners in their own subject areas, are not necessarily maintaining the currency of their own information seeking skills.

(Te Kunenga ki Purehuroa – Inception to Infinity: Massey University's commitment to learning as a life-long journey)

Much of the literature about the acquisition of information skills within universities relates to the teaching of students and to the skills required by graduates. (Owusu-Ansah, 2004; Buchanan et al., 2002; Candy, 2000) It is assumed that university academic staff have, in the course of their own education and subsequent research and teaching activities, acquired and maintained the information skills and the understanding of the knowledge environment needed to operate effectively in a profession that is defined, perhaps more than any other, by the accumulation, examination, creation and communication of knowledge. There is a reverse logic to the assumption that because they are operating effectively they must therefore have the requisite skills and understanding to do so. The university, almost by definition, is seen to have created and maintained a research environment and culture in which participants share not only information itself but also knowledge about information sources and the skills needed to use them. Librarians naturally play a supportive role in this process, but one that is largely confined to acquiring and organising the information itself and providing informal support and advice in its use. The formal teaching of information skills is regarded as important for students who are still learning how to do research but such skills once acquired are then considered, like riding a bicycle, to be adequately maintained and developed by ongoing practice.

In recent years a growing emphasis on academic practice and the need for university teaching to be more strongly linked to identifiable research has highlighted the fact that research performance is very uneven. (Goldfinch, 2003; McMillan, 2003; HERO - Higher Education & Research Opportunities in the UK, 2001) In New Zealand the introduction of Performance Based Research Funding has required university staff to submit portfolios of research outputs that will be evaluated and "graded" according to such criteria as the citation rankings of the journals in which articles are published. What has been known anecdotally about the balance between teaching and research varying across the range of disciplines is now becoming quantifiable and universities are recognising that the existence of a research culture cannot be taken for granted but requires nurturing and support through such activities as training and mentoring (Massey University. Training and Development Unit, 2003; University of Sheffield, 2002; Eliasson et al., 2000).

A paper given at this conference two years ago contrasted the impoverished information environment of students with that of academics who had "established networks for identifying information and accessing the shared information resources of an established culture" but went on to cite another study to the effect that "students … generally lacked confidence in the ability of the supervisor to assist in the development of high level information skills" (Abbott & Selzer, 2002), (Genoni & Partridge, 2000). That a discrepancy exists between formal expectations of the information skills and understanding of academics and their actual performance should come as no surprise however. While Abbott and Selzer correctly pointed to networks and shared culture as being the great strengths of the academic research community there is, leaving to one side for the moment any concern about the extent to which all academics participate in these networks, substantial reason to question whether the networks themselves are capable of performing the complex task expected of them in this regard. Mann pointed out the weakness of "the invisible college" when "one's colleagues are themselves innocent of contact with library resources." (Mann, 1993)

It is important, however, not to suggest that the information seeking behaviour of academics is absolutely deficient in varying from a predetermined norm that lies within the domain of librarians and information specialists. A recent study of the search habits of "domain experts" (Drabenstott, 2003) has summarised research that suggests that their academic literature searching is firmly integrated into the totality of their existing knowledge of their fields and of the literature. Far from being a neat stepwise progression from a state of unknowing ("information need") to one of knowing, it is in fact an ongoing interaction with the literature through such activities as "area scanning", footnote chasing and known author searching. Stoan had noted that established researchers identify "much of what they need without recourse to the library's access and synthetic literature" because of their knowledge of the major contributors to their fields and their extensive reading of the literature (Stoan, 1984). While their range of behaviours may have been extended by the desktop availability and multiple-year searching capacity of online databases there is still reason to believe that many academics rely primarily on their existing knowledge of authors and sources and that they may even find the keyword approach to information searching unsatisfactory (Jefferson & Nagy, 2002). The popularity of cited reference searching and its extension beyond the originating ISI databases would tend to confirm this view, as it is a methodology slanted towards the use of existing domain knowledge. Mann has characterised the information behaviour of scholars as following "the Principle of Least Effort" (Mann, 1993) and any approach to modifying this behaviour needs to take that principle into account.

A difficulty exists here, however, in that we cannot automatically assume that all academics are domain experts in all circumstances. There is considerable movement of staff between academia and industry, for example, and a consequent need to develop current knowledge of the field before key authors and information sources can be identified. In other cases an academic who has concentrated on teaching may find that they are required to undertake more research. Interdisciplinary research and the development of new areas are other cases in which domain expertise cannot be taken for

granted. A further drawback to area scanning is that it is not always either efficient or effective. An excessive reliance on known authors and sources may retard a researcher's awareness of new developments and of the linkages between their own area and related fields. The ideal toolkit would equip the researcher with skills for both area scanning and information searching.

The greatly increased information access provided by electronic systems has come at the cost of a correspondingly greater degree of complexity and the high rate of change has continued to make skills and knowledge redundant at an equally fast rate. While much of this change and complexity is relatively trivial and relates to such matters as variations in truncation symbols or methods of creating marked sets of records, it is precisely these factors that stand as a barrier to any but the most basic use of many information systems. The use of a minimal set of techniques is an understandable response to the variability that exists between different systems and over time within the same systems. Many databases, for example, use the same standard Boolean logic but differ syntactically, using different truncation symbols, adjacency operators, limits and so on. By ignoring these features the library user is able to assemble a simple toolkit that works in most circumstances but at a considerable cost, usually not visible to them, in terms of both recall and accuracy. While this is absolutely understandable it greatly decreases the value of the institution's investment in information products.

An environment characterised by rapid change at the detailed level is not well suited to the "cultural transmission" of knowledge and skills from senior members of the community to neophytes. Although patterns of knowledge transmission through university communities are considerably more complex than this simple model suggests it is nonetheless true that those to whom a student or junior staff member might look to as possessors of a weight of knowledge and experience in the field are no more likely than anyone else to be up to speed with the electronic "latest thing". It could even be argued that, as new technologies are taken up more readily by younger people (Chau & Hui, 1998), and by those with a certain amount of discretionary time, academic discipline leaders are in fact less likely to be early adopters of novel information seeking and management practices and that this is the source of some of the tension surrounding the ongoing information revolution.

Massey University is a fairly typical example of the benefits afforded by the new information environment and of the difficulties presented by it as well. Situated in Palmerston North in the lower half of the North Island, an area of only medium population density, it was originally New Zealand's only provider of university education by distance and remains pre-eminent in this field with a large body of students throughout the country. Ten years ago Massey embarked on an ambitious programme of expansion, opening a second campus in Auckland and merging with the College of Education in Palmerston North and with the Wellington Polytechnic. (Both of these institutions have been fully incorporated into the university with their staff taking on the status and accountabilities of university academic staff. One result of this is that there are many university staff working on PhDs or otherwise trying to establish research careers). At present the university operates on four main sites and has five libraries. At each stage of

development the affordances of the electronic environment have provided critical support to this development, from the online catalogue giving staff and students at new or smaller sites access to the total library collections, to the extension of online database access to distance students and more recently to the electronic provision of substantial journal collections to the entire university community. At the same time this process has placed heavy demands on the university's computing and network infrastructure which has struggled to deliver quality access to the full range of information provided by the Library. It has also required library users to keep up with constant change and to tolerate a degree of uncertainty about the resources available to them and the optimal means of accessing them.

By and large these developments have been received very positively but a growing concern by many academic staff that they have "lost touch with the Library" is also evident. The making of fewer visits to the Library as a result of electronic journal provision is an obvious and universal example and there is consequently less opportunity for casual contact with library staff that went along with information or serials desk enquiries. Massey, like many libraries, introduced a liaison scheme giving librarians specific responsibility for groups of academic staff and postgraduate students in order to counter this trend and to follow the information out of the library. As well as formal training they have provided individual research consultancies which have been taken up more enthusiastically by postgraduate students than by staff. Many staff will recommend that their PhD students take a research consultation with a member of the library staff much more readily than they will request one for themselves. Academic staff, following the Principle of Least Effort, seek no more than a minimal toolkit of techniques and the task of information skills trainers is to help them develop the most effective toolkit consistent with the principle.

Eleanor Smith of North Carolina State University has developed a checklist of information skills for the "Professional Scientist: Postdoctoral and Independent Researcher" which is a very useful summary of what such a toolkit would consist of. (Smith, 2003)

- Updates on new features of known resources and introduction to new resources.
- Keeping up with the literature: environmental scanning/browsing, table of contents services, alerts/SDIs.
- How to identify core journals in a discipline.
- Citation indexing and Journal Citation Reports. "Publish or Perish." The uses and limitations of citation counting and impact factors. Searching the ISI databases.
- Advanced searching of key, discipline-specific resources. Bibliographic and data sources.
- Science on the web: portals, resources, directories, news, organization and publisher information, searching, databases available.
- Locating meeting and grant news and announcements.
- Issues in scholarly publishing and communication. Copyright. The serials crisis.
- The E-journal revolution, electronic publishing, and accessing full-text journals online. Relevant preprint collections or services.

- Managing a personal resource collection. Different organizational ideas and systems. Bibliographic management software tools.
- Crossing boundaries, entering new territory. Inter- or cross-disciplinary searching. Locating key information tools and ideas in new subject areas.
- Information skills and instruction in undergraduate and graduate courses, and in graduate and postdoctoral training and mentoring.

This list is valuable in that it includes searching and scanning skills, current awareness tools, use of the internet and bibliographic management software and places the skills firmly within the broader context of academic practice. The use of tables of contents services and automated alerts, for example, provide forms of area scanning that are both familiar and congenial but that extend the researcher's capability well beyond what has traditionally been possible. Bibliographic management software provides a linkage between the literature search and publishing activities and is widely popular but its full functionality, particularly in relation to database searching, is not widely appreciated. A broader understanding of e-journal publishing and related ownership and copyright issues is a counter to the widespread misconception that, in the new environment, information has become freely and universally available. The identification of core journals is an aid not only to scanning but to publishing as well, whereas an understanding of the Journal Citation Reports and journal ranking systems is fast becoming an essential tool for the modern academic. Lastly, and by no means least, the ability to locate quality information and websites of high domain relevance on the internet is an absolutely basic skill for any knowledge worker.

Smith's list also highlights the fact that much of the additional capability, or added value, provided by electronic information systems has a greater relevance for research students and academic staff than for undergraduate students. But while research students have a natural point in time at which to begin to acquire information skills and a distinct awareness of the need to do so this is much less the case for academic staff. The importance of "embedding" the learning of these skills into a broader learning context has been widely recognised (Abbott & Peach, 2000) but there are difficulties in locating an appropriate context for academic staff when so much of their professional learning is delivered by colleagues and research networks. Massey University Library liaison librarians had used various outreach techniques involving visits to departments (including "library connection" sessions held in departmental computing labs) or individual research consultations with some success but it was difficult within this context, where the emphasis tended to be on new information products or where help was generally solicited for quite specific problems, to introduce academics to a broad range of issues relating to the new information environment.

An opportunity presented itself in the form of the University's Training and Development Unit's (TDU) Research Management Skills Programme. The aim of this programme, which leads to the Research Management Skills Certificate, is to "encourage and support staff new to research at Massey." (Massey University. Training and Development Unit, 2003) It consists of modules which "are designed to provide opportunity for participants to obtain policy and practice information and to engage and interact on various topics and

issues. Participants will gain insights from experienced senior researchers presenting at the workshops and seminars." A proposal was made to TDU that a knowledge management module be presented and on its acceptance a half-day presentation was prepared entitled "Knowledge Management in the Emerging Electronic Environment". The title emphasised the intention to go beyond a traditional library or information skills approach and offered an integrated set of skills for exploiting the new environment.

Obviously this was a broad area to cover in half a day and the session was essentially an overview introducing participants to a wide range of functionalities rather than trying to teach specific skills in detail. The aim was that they would become aware of the scope of electronic information functionality and of areas that they could later explore in depth. A further relevant factor was that the Research Management Skills Programme was multidisciplinary in nature – TDU courses are marketed to the whole academic community so that whatever was produced had to be of broad appeal and relevance. Ideally a programme of this type would be of high domain relevance to participants but there was a tension in this case with the cross-disciplinary nature of the programme. A further potential difficulty arose from the likelihood that participants' existing levels of knowledge and skill would vary widely.

The presentation covered the following areas

- An overview of the electronic information environment, and the distinction between the deep and surface webs
- Use of Google, including advanced searching and limiting by country and domain
- The relationship between the web and standard academic publishing formats and the importance of access tools
- Standard database searching, including Boolean logic, truncation and proximity operators. Links between database records and electronic documents
- Cited reference searching
- Journal contents page alerts and subject-based alerts
- The importance of learned society web pages and other internet communities
- Use of bibliographic management software to capture, store and output records
- Journal citation reports and other methods of selecting journals in which to publish.
- Participants were encouraged to reflect on the implications of what they had learnt for getting their own research published and read and on their own role in encouraging lifelong learning for their students.

Emphasis was placed on a presentation that would be lively, interactive and varied without being patronising. It was broadly based around a PowerPoint slideshow using a mixture of explanatory slides and screen shots with four or five hands-on exercises. To minimise any discomfort that may have been felt a light and humorous tone was maintained and the detailed complexity of the field was acknowledged. The unique characteristics of academic information were emphasised throughout and the continuity between the print and electronic environments was highlighted wherever possible.

Confirmation of the relevance of the session and of the need for it came with the high number of enrolments when it was advertised as part of the TDU Research Management Skills Programme. There was strong interest from the start and a total of sixteen sessions were delivered to 211 staff over three campuses during 2003. Attendance was roughly similar over the three campuses – it was higher in Wellington as an extra session was held for a departmental group at the request of its manager.

Although no formal analysis of the status and length of employment of attendees was undertaken they appeared to fall into four groups: relatively newly-employed staff including some in research support positions, staff upgrading qualifications, staff who had been researching for more than ten, or even twenty, years (including some fairly senior academics) and a group with reasonably well-established research careers. The reasons for attendance for those new to academic life or upgrading their qualifications are obvious. The lack of relevant information skills amongst senior staff was noticeable and they possibly are less able to acquire this behaviour through networking but were comfortable doing so in a formal training context alongside other academic staff. Those with well-established research careers tended to be "research enthusiasts" keen to acquire fresh techniques.

As soon as the first round of sessions had been held the presenters concluded that the content of the course was both novel and relevant to participants. While many participants had heard of Boolean logic their understanding tended to be hazy and all but a few were surprised by the power of Google Advanced Search. Many participants had heard of bibliographic management software but few were using it and fewer still were aware of the extent of its functionality. It was also evident that electronic networking and current awareness were not widely practised. At one session none of the participants currently subscribed to any academic electronic discussion groups and held the view that they "already got too much email" suggesting that they did not make full use of the organisational and filtering capabilities of their software.

Evaluation forms aimed at obtaining feedback to improve the modules were distributed at all sessions. Participants were asked to rate the session, reflect on its relevance (particularly of aspects and/or knowledge that they are likely to apply), comment on the general presentation and content, and list suggestions for improvement of further training sessions. The average rating was 4.38 out of a maximum rating of 5, indicating that the content and presentation were favourably received by participants. The qualitative comments in the feedback indicated that the aims and relevant issues were being addressed. The feedback was collated, reflected and acted upon appropriately.

An informal telephone survey was conducted in January 2004. A random sample of 21 attendees (10% of participants) were contacted and asked whether they had used any of the knowledge or skills they had gained from attending the session, and if they thought the session was worthwhile. One participant, who was a recent graduate, said he knew most of it but it was a good refresher for him. The rest said they had successfully applied skills and knowledge gained from the session. Without exception they stated that it was 'definitely' worth attending. A number of participants had recommended the programme

to colleagues and it was the experience of the presenters that some participants at later sessions were attending because of word-of-mouth reports. Others had referred postgraduate students to liaison librarians for research consultations.

CONCLUSION

The concept of lifelong learning implies that the learner is undertaking a journey coextensive with life itself and that there is no point of arrival. It is easy then to overlook those who have "arrived" and to exempt them from the necessity to update their skills and knowledge on an ongoing basis. If this attitude exists, albeit unconsciously, towards and on the part of professional academics then it has not served them well. Professional training for academics is a relatively new and growing field and one to which information professionals have much to contribute. While the programme at Massey University has been relatively limited in scope it has highlighted both the need for a more formal and extensive approach to the area and the likelihood that it will be received with gratitude and enthusiasm.

References

Abbott, W., & Peach, D. (2000). Building info-skills by degrees: embedding information literacy in university study. In *IATUL Conference Proceedings* International Association of Technological University Libraries. Retrieved January 20, 2004 from http://www.iatul.org/conference/proceedings/vol10/papers/Abbott_full.html

Abbott, W., & Selzer, D. (2002). Getting connected, getting ahead: developing research students' information skills in an online learning environment. In *International lifelong learning conference: refereed papers from the 2nd international lifelong learning conference* (pp. 43-49). Rockhampton: Central Queensland University Press.

Buchanan, L. E., Luck, D. L., & Jones, T. C. (2002). Integrating Information Literacy Into the Virtual University: a Course Model. *Library Trends, 51*(2), 144-166.

Candy, P. C. (2000). Knowledge navigators and lifelong learners: producing graduates for the information society. *Higher Education Research & Development, 19*(3), 261-277.

Chau, P. Y. K., & Hui, K. L. (1998). Identifying early adopters of new IT products: a case of Windows 95. *Information & Management, 33*(5), 225-230 . Retrieved January 15, 2004 from ScienceDirect database.

Drabenstott, K. M. (2003). Do nondomain experts enlist the strategies of domain experts? *Journal of the American Society for Information Science and Technology, 54*(9), 836-854. Retrieved January 5, 2004 from Wiley InterScience database.

Eliasson, M., Berggren, H., & Bondestam, F. (2000). Mentor programmes - a shortcut for women's academic careers? *Higher Education in Europe, 25*(2), 173-179.

Genoni, P., & Partridge, J. (2000). Personal research information management information literacy and the research student. In C. Bruce, & P. Candy (Editors), *Information literacy around the world: advances in programs and research* (pp. 223-236). Wagga Wagga, New South Wales: Centre for Information Studies.

Goldfinch, S. (2003). Investing in excellence? The performance-based research fund and its implications for political science departments in New Zealand. *Political Science, 55*(1), 39-53.

HERO - Higher Education & Research Opportunities in the UK. (2001). *Higher Education & Research Opportunities in the UK: RAE 2001 : Results.* Web site: Accessed on March 29, 2004 at http://www.hero.ac.uk/rae/Results/

Jefferson, T. I., & Nagy, T. J. (2002). A domain-driven approach to improving search effectiveness in traditional online catalogs. *Information & Management, 39*(7), 559-570. Retrieved December 20, 2004 from ScienceDirect database.

Mann, T. (1993). *Library research models : a guide to classification, cataloging, and computers*. New York : Oxford University Press.

Massey University. Training and Development Unit. (2003). *Research management skills programme.* Web site: Accessed on January 20, 2004 at http://tdu.massey.ac.nz/html/research-skills-frame.html

McMillan, V. (2003 July). Tertiary sector is tested to prove research strengths. *The Independent*.

Owusu-Ansah, E. K. (2004). Information Literacy and Higher Education: Placing the Academic Library in the Center of a Comprehensive Solution. *Journal of Academic Librarianship, 30*(1), 3-16.

Smith, E. M. (2003). Developing an information skills curriculum for the sciences. *Issues in Science and Technology Librarianship, 37*, Retrieved January 22, 2004 from http://www.istl.org/03-spring/article8.html.

Stoan, S. K. (1984). Research and library Skills - an analysis and interpretation. *College & Research Libraries, 45*(2), 99-109.

University of Sheffield, S. D. U. (2002). *Research Support Topics.* Web site: Accessed on March 29, 2004 at http://www.shef.ac.uk/stdu/Research/resbrochure.html