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Using knowledge management in building a culture of research: a case study of an Australian academic library.

**Liz Walkley Hall
Flinders University Library**

1. Introduction

Knowledge management (KM) has been much discussed in the library and information science literature, from papers describing its potential for the profession (Broadbent, 1997; Butler, 2000; Nelson, 2008; Sarrafzadeh, Martin and Hazeri, 2010; Townley, 2001) to case studies of uptake and impact (Branin, 2003; Jain, 2013; Jantz, 2001; Islam et al., 2015; Porumbeanu, 2010). Similarly, there are many representations in the literature of libraries establishing support groups for librarians undertaking research, especially in academic libraries (Blessinger, et al., 2010; Cirasella and Smale, 2011; Fallon, 2012; Gratch, 1989; Lee, 1995; Sapon-White, King, and Christie, 2004). However, there are few who have explored the intersection of knowledge management with creating a culture of research and learning in libraries (Madge, 2012; Sheng and Sun, 2007). This paper seeks to add to this literature in describing a case study at an Australian academic library.

Flinders University Library has, over the past four years, been actively building a culture of research among its professional staff, in order to equip them with the skills and expertise necessary in an era of continuous change for libraries. It has done so through the implementation of a support group for professional staff to undertake research projects, known as the Research Working Group (RWG). Its brief is to 'develop a culture of research and professional reflection amongst the library's professional staff'. While it is focused on the creation of knowledge in undertaking research, there are other important components: diffusing this knowledge throughout the organisation; and reusing this knowledge to inform decision-making.

This paper focuses on how knowledge creation, knowledge sharing, and knowledge reuse have manifested in RWG-related research projects. To understand this, two methods were used: an audit of KM tools available to the RWG was conducted; and a secondary analysis of interview transcripts was undertaken. Together, these approaches show how KM tools have been used by the RWG in building a culture of research.

2. Definitions

There is no universally recognised definition of knowledge management. Ferguson (2006) notes that the different KM definitions are contextual; that is, they are largely dependent on "the disciplinary tradition and practice from which the authors write." (198). In LIS literature, especially in an academic library context, Townley's definition of KM is often quoted and is used here:

"Knowledge management may be defined as the set of processes that create and share knowledge across an organisation to optimise the use of judgement in the attainment of mission and goals" (2001: 45).

Knowledge management is concerned with both tacit and explicit knowledge. As defined by Nonaka and Takeuchi (1995, in Aharony, 2011: 112) tacit knowledge is learned from experience, subjective and difficult to capture. It is embedded in the minds of workers and shared most commonly in social interactions (Townley, 2001: 47). Explicit knowledge, by contrast, is more easily communicated by text or diagrams, is objective and can be codified (Nonaka and Takeuchi 1995, in Aharony, 2011: 112). The key to effective knowledge management has been described as its human, and therefore social, aspect: Madge (2012) points out that “some analysts understand knowledge management as facilitating interaction among people and groups, this interaction being the real source of knowledge creation and sharing” (246).

3. Literature Review

3.1 Knowledge management in academic libraries

Knowledge management has been studied widely in the LIS literature, and includes many examples of the use of KM in academic libraries (Branin, 2003; Jain, 2013; Jantz, 2001; Islam et al., 2015; Madge, 2012; Mphidi and Snyman, 2004; Porumbeanu, 2010). As this paper is a case study of an academic library, that sector will be the focus here.

One of the earlier case studies is provided by Branin (2003), who describes the implementation of an IT-based knowledge management solution at the Ohio State University. As an institutional repository, its intention was to capture the variety of digital assets being created by the institution (52). This project did not, however, seek to capture any tacit knowledge. Jantz (2001) also offers an example of an IT-based knowledge management tool at the New Brunswick campus library of Rutgers University. The Common Knowledge Database was designed to capture “the informal knowledge that every librarian possesses” (33) - that is, their tacit knowledge. Jantz acknowledges the difficulty of doing this, with both cultural issues in the library and personal issues for librarians who were unaccustomed to sharing knowledge (39). Mphidi and Snyman (2004) report on South African academic libraries’ use of intranets as a knowledge management tool. They identified several factors of intranets as successful knowledge management tools, including consistency, interactivity, and ease of use (395-96). While all these papers offer examples of KM tools that were innovative at the time, it is also important to recognise that these systems may have less relevance now, given developments in mobile and social media applications.

More recent papers on KM in academic libraries explore some of the cultural issues in capturing and sharing librarians’ tacit and explicit knowledge. Madge (2012) creates a model for knowledge sharing in her study of a large academic library in Romania. While noting the importance of technology to underpin the process of knowledge management (253), she stresses that “developing an organizational culture open to sharing knowledge...is perhaps the most important step” (255). Her framework emphasises communication, specifically informal communication, as a way of encouraging learning from one’s colleagues (260). Huang (2014) assesses individual and organizational knowledge activities in academic libraries in China, and finds that while academic librarians recognised themselves as undertaking knowledge-intensive activities, they did not identify their libraries as knowledge-intensive organisations (442). Jain (2013) examines KM practices in Southern African Development Community (SADC) university libraries. She found that one of the challenges

of implementing KM is organisational culture (9-10), and that while many SADC community libraries were practicing KM, not all were doing so fully (9).

These papers build a picture of the use of KM in academic libraries around the world. In the Australian LIS literature, however, those who have examined KM have done so outside of the specific confine of academic libraries. Southon and Todd explore library and information professionals' perceptions of knowledge management and implications for education in their two part study (Southon and Todd 2001; Todd and Southon 2001); Ferguson (2006) discusses the implications of Australian Standard 5037-2005 (Knowledge Management) for the LIS profession; Martin, Hazeri and Sarrafzadeh (2006) provide an international perspective of KM from an Australian base; and Ferguson, Hider and Lloyd (2008) explore whether librarians are the ultimate knowledge managers. While some participants in these studies are drawn from academic libraries, none focus exclusively on that sector.

3.2 Support for librarians undertaking research

There is also a strong body of literature that has examined support for librarians undertaking research. The value of support, such as peer support and mentoring, writing groups and resourcing for research, has been shown to be highly beneficial in creating a research culture (Blessinger et al., 2010; Cirasella and Smale, 2011; Gratch, 1989; Lee 1995; Sapon-White, King, and Christie, 2004; Stephens et al., 2011). However, most studies have concentrated on those academic libraries with a tenure process, usually in the United States or Canada. There are fewer examples of how librarians are supported to undertake research where it is not required for promotion (Allen, 1986; Fallon, 2010; Hall, Kenna, and Oppenheim, 2011; Sullivan et al., 2013).

Although there have been linkages made between a culture of learning and knowledge management in libraries (Madge, 2012; Huang, 2014) as well as innovation and knowledge management in libraries (Islam et al., 2015; Sheng and Sun, 2007), there has not been a focus specifically on KM in a research context in academic libraries. Those who have examined building a successful research culture have often done so through case studies that describe support for research and its outcomes, usually measured by publication rate (Stephens et al., 2011; Sapon-White, King, and Christie, 2004; Sullivan et al., 2013; Fallon, 2012).

The background to, and implementation of, the RWG at Flinders University Library is explored in detail in a separate paper (McBain, Culshaw and Walkley Hall, 2013). That paper outlines the context in which the RWG was formed, the structure and governance of the group, and the group's operation. A subsequent paper then examined impact of the RWG on professional staff (Walkley Hall and McBain, 2014). This paper now focuses on looking at how knowledge management has supported building a culture of research, through the creation, sharing and reuse of knowledge.

4. Context

4.1 University profile

Flinders University is a mid-sized, PhD granting, teaching and research institution based in Adelaide, South Australia. It offers over 350 courses in a range of disciplines, and has research strengths in medicine, psychology and sociology (QS World University Rankings,

2011). The University's student population is approximately 24,000 - of whom 15,000 are undergraduate students and 9,000 postgraduate students. There are around 1,100 academic staff and 1,500 professional staff. Flinders University, like most universities in Australia, is a publicly funded institution.

4.2 Library context

Flinders University Library, over the last decade or so, strategically aligned itself with the teaching and learning programmes of the University. This has occurred in both the online and physical spaces: for example, the University's learning management system was adopted as the key mechanism for library service delivery to students; and the library's public spaces were redesigned to create more shared study facilities and group spaces. The success of this approach has been recognised with high rankings in nationally benchmarked user satisfaction surveys as well as high per-capita use of library facilities and resources. However, it is only recently that there have been attempts to build similar engagement with the University's researchers and research processes. The Research Working Group has been one of these mechanisms.

The library employs around 95 staff, almost half of whom (approximately 45%) are qualified librarians. Most librarians hold an undergraduate (Bachelor) degree as well as a postgraduate qualification (Masters or Diploma) in librarianship; those librarians who do hold research higher degrees have earned them in disciplines outside librarianship and, until the implementation of the RWG, there had been little experience of undertaking research in a LIS context. Further, librarians at Flinders are employed as professional staff members of the University rather than academic staff and are not expected to undertake research in order to gain promotion. This is also the case for the majority of other academic libraries in Australia.

5. Methods

In order to understand how KM tools have been used to in building a culture of research at Flinders University Library, two methods were used. Firstly, an audit of KM tools offered to the RWG was undertaken, as identified in AS 5037-2005: Knowledge Management (Standards Australia, 2005) and augmented by those described by Agarwal and Islam (2014). Secondly, a re-analysis of interviews that were conducted with past and current members of the RWG was undertaken, seeking evidence of how research-related knowledge has been created, shared, and reused.

The interviews were semi-structured and exploratory in nature, seeking narratives rather than quantifiable data; participants were encouraged to describe events in their own words. The target population was those staff who had directly participated in RWG projects. Eleven potential participants were identified, and an invitation to be interviewed was distributed by email to all. This email comprised the formal request as well as the information sheet and consent form. Interviews were recorded using TagPad, an iPad application designed specifically for recording qualitative research interviews (Borneo et al., 2011). One participant declined to be recorded, but allowed notes to be transcribed. Interviews were analysed using the qualitative data analysis program NVivo, Version 10 (QSR International Pty Ltd). Ethics approval for this research was obtained from Flinders University's Social and Behavioural Research Committee.

6. Findings

6.1 Audit of KM tools

Knowledge management tools - also known as enablers - are those activities, techniques and technologies available to organisations to support all phases of the knowledge management cycle, from capture or creation through to application and reuse (Dalkir, 2011, in Agarwal and Islam, 2014: 323). While many sources of comprehensive lists of KM tools exist, that compiled by Standards Australia has been used as a source list, supplemented by the list of KM information technology (IT) and non-IT tools identified by Agarwal and Islam (2014) for a LIS context. Table 1 describes each of the KM tools that have been used by the RWG.

Tool	Description	Implementation
Champions and advocates	Those who actively support the adoption of the change. Both formal and informal leadership roles as champions are advisable (Standards Australia, 2005: 36)	The RWG is led Chair who acts as an advisor for both group members and other library staff interested in research. There is also a Consultant attached to the RWG who is an experienced researcher. The Chair and Consultant can be considered the formal champions. All RWG members have self-selected to undertake projects, and in this sense act as informal advocates to the rest of the library staff.
Digital repository	Allows collections of content to be organised and accessed in a consistent manner (Standards Australia, 2005: 42)	Publications produced by RWG projects can be added to the University's digital repository, further enabling knowledge sharing outside the library as well as potential knowledge reuse.
File sharing	Facilitates sharing work online securely for those working in groups (Agarwal and Islam, 2014: 336)	The RWG contains members from different workgroups in the library. As RWG projects can sometimes contain confidential information, a RWG share drive was created that is restricted to RWG members only. Members use the shared drive to save working documents, datasets and ethics forms so that other members of their research team can access them.
Intranet/ Wiki	An internal computer network with a web browser application that allows authorised access to documents,	All RWG projects, both past and current, are documented on a wiki on the library's intranet to which all library staff have password-controlled access. Each project can upload those documents that can be shared internally

	forms, etc. that is searchable, accessible and secure (Standards Australia, 2005: 50)	(eg, timelines, completed ethics forms, survey instruments, internal reports and the like) that not necessarily suitable for an external audience.
Knowledge cafe	A group discussion, used to reflect and to develop and share any thoughts/insights that emerge in a non-confrontational way (Agarwal and Islam, 2014: 331)	A knowledge cafe was organised by the RWG Chair, to which all professional staff were invited. Facilitated discussions were held on three topics: library data and statistics; the publishing process; ALIA's role in research. This gave the library's professional staff the opportunity to both share their own knowledge and learn from each other.
Meetings	Effective meetings can facilitate sharing of both tacit and explicit knowledge, and can help build a bank of relevant knowledge. (Standards Australia, 2005: 43)	RWG meetings are conducted throughout the year. Members report on progress, share their experiences and offer advice and support. As RWG members work in different areas of the library, it is also beneficial in bringing together staff who may not normally interact regularly with one another.
Networks and communities	Networks and communities that extend beyond organisational boundaries to external groups or individuals helps expand the existing shared knowledge base. (Standards Australia 2005: 45)	RWG members are encouraged to network outside the organisation in order to contribute to the wider development of professional ideas and discourse. Interactions with library colleagues, for example through ALIA (Australian Library and Information Association) events, as well as more broadly in the higher education sector, are both considered highly useful. Conferences, seminars and workshops have all been used to facilitate sharing amongst wider networks by members of the RWG.
Peer assistance	Direct knowledge transfer from individuals to others; used to solicit assistance from peers and subject matter experts (Agarwal and Islam, 2014: 331)	RWG members are encouraged to seek support from one another, and from previous members. In addition, an informal register of research interests and strengths of those outside the group is maintained, in order to call upon the wider expertise available in the library. The most used 'peer expert' to date would be the University's statistical consultant.

Table 1: KM tools used at Flinders University Library

While by no means exhaustive, this list provides an example of how these specific tools have been used to build and support a culture of research. Agarwal and Islam (2014) note that no single set of tools is applicable across every library and stress that IT tools are constantly changing (330). Their advice is apposite: libraries seeking to adopt KM tools or activities should undertake their own audit to discover what might best suit them at the time of their implementation.

6.2 Interviews

Seven librarians self-selected to participate in interviews, of a possible 11 who were deemed eligible for participation through their direct involvement in a past or current RWG project. Recruitment for interviews coincided with a teaching break, making some staff unavailable due to leave. To differentiate between responses, participant codes - P1 for participant 1, and so on - have been used.

6.2.1 Knowledge creation

Interview participants were encouraged to explore what they had learnt through undertaking their research projects. While this was interpreted as a skills assessment by some, analysis of the transcripts found that many did refer to acquiring new knowledge. This manifested in their descriptions of *doing* research projects, with some participants articulating that they may not have gained this knowledge any other way. For example, P5 noted that doing research “forces you to learn ... then you can be a bit of an authority” and P6 observed that “i. I don’t think I could have understood it [research] until I did it.” These responses reflect Sheng and Sun’s description of “knowledge by practice” (2007: 45) as a knowledge creation method.

However, the largest gain in knowledge creation that participants identified was in completing the University’s Social and Behavioural Research Ethics Committee’s approval process for projects with human participants. Even though some participants had previous research experience, this was the first time that all but one had submitted an Ethics application. All interview participants mentioned the Ethics process specifically, and again alluded to the value of doing it as a learning experience:

“...one of the most valuable parts of the whole project was going through it [the Ethics approval process]” (P2)

“the Ethics process ... I don’t think there’s any other way we in the library could have learnt that kind of thing” (P5)

“going through Ethics approval.. that’s been useful in many ways, thinking not just about our research but understanding what our researchers do.” (P6)

It could be argued that this was most obvious in participants’ minds because it was the first time most had done it, and that many other aspects, such as literature reviews or report writing, have a basis in other professional tasks. However, it does seem that the participants also felt it to be a baptism of sorts into the research world, with one saying she now felt she had ‘bone fide involvement’ as a researcher (P5) because she’d done an ethics application.

6.2.2 Knowledge sharing

Knowledge sharing has been described as the critical barrier for knowledge management (Arahony, 2011: 111). With an estimation that up to 90% of the knowledge in any organisation is located in its employees’ heads (Sheng and Sun, 2007: 38), opportunities to share this are crucial to maximising its reuse, as well as the potential creation of new

knowledge. The RWG has brought professional staff together to share knowledge that they have gained in undertaking a research project through knowledge management tools such as meetings, seminars, knowledge cafes, and the use of peer assistance, as described above in Table 1.

Interview participants were asked to explore how they had shared what they'd learnt as part of their research projects. When these responses were analysed and coded, three tiers of knowledge sharing emerged:

- sharing knowledge within their own research groups;
- sharing knowledge internally, with peers in the RWG as well as more broadly within the library;
- sharing knowledge externally, with others in the profession.

The opportunity to share knowledge and learn from each other was identified by three participants who work in research groups (P3, P5, P7), with one identifying that knowledge creation can be borne out of knowledge sharing: "a lot of it is learned from listening to other people's experiences" (P3). One participant also described how, because her team consisted of colleagues from different departments, they'd had opportunities to share knowledge outside of their research work too: "We've gone to meetings to ostensibly talk about our research and come out with something [else]... because it's not focused on our normal working conversations - it brings up stuff, or values, that hasn't been shared [before]".

All interview participants identified that they had shared knowledge with their peers - either within the RWG, or more broadly in the library. Mostly this had come about due to mechanisms put in place by the RWG, consistent with the literature in showing that opportunities need to be created for people to share their tacit knowledge (Butler, 2000: 38; Townley, 2001: 47). These KM tools for tacit knowledge sharing include RWG meetings (identified by P1, P3 and P4) and RWG seminars to which all professional staff are invited to attend (identified by P5). Meetings were described as "motivating" (P1) and "learning experiences" (P4). P5 described how "the [internal] presentations to talk about research are really important [because] everyone in the library gets involved."

The third tier of knowledge sharing identified by participants was external; that is, sharing knowledge more widely in the profession. Analysis of the transcripts found that conference attendance was mentioned specifically by P1, P4, P5 and P7. This is in line with the description of 'networks and communities' by Standards Australia (2005: 45), which enables "individuals [to] return to their organisation with new knowledge or a contrasting viewpoint" (Standards Australia, 2005: 45). Two participants also identified that the RWG was changing the library's culture of sharing knowledge externally. P5 felt that in the past, Flinders had been "... very good at doing stuff and yet we didn't tell anyone about it". P4 noted that prior to the implementation of the RWG, Flinders' librarians were not "going out there [i.e. to present at conferences] ... but now we're getting out and about and it's really fantastic."

Whether it is the personality of individuals involved, as posited by Arahony (2011), or that the organisational culture is favourably inclined toward knowledge sharing (Porumbeanu 2010),

the outcome remains the same: in order to build a successful research culture across the library, it is essential that knowledge is shared. The RWG has created mechanisms for this, but more importantly, they have been used.

6.2.3 Knowledge reuse

Knowledge sharing, by extension, creates opportunities for knowledge reuse (Nelson, 2008: 137). Participants were asked to consider how they had re-used, applied or incorporated the knowledge shared by their colleagues into their own projects. However, that this does not capture all the potential re-use of this knowledge by those outside the RWG, and so offers only a partial picture.

Not unexpectedly, those participants who were amongst the first to conduct RWG projects were less likely to have re-used knowledge, and those whose projects have been conducted more recently were more likely. That the first few projects were the 'trailblazers' was acknowledged by more than one participant (P2, P4, P5). Projects where knowledge was reused were identified by P1, P2, P5, and P7. This was mostly in the application of explicit knowledge, which due to its very nature allows for easier reuse (Sarrafzadeh, Martin and Hazeri, 2010: 209). For example, P1 created an internal document which was used to inform information literacy classes, and P5's project was used to inform a new LibGuide: "Everything's written down. So we said to someone else, this is what we want ... now that we've done the research, this is what we know we need". Another participant identified that she'd integrated another piece of research from the RWG: "I looked at the research the others were doing [in the RWG] and didn't think they related to what I was doing. But in the end I actually found they did tie together." Also significant was P6's observation: "I also work in a team where a lot of people are doing research. I've learnt a lot from their research ... [it's] directly impacting on our practice." This recognises the benefits as a recipient of shared knowledge, in line with Davenport and Prusak's description of how knowledge assets increase with use: "shared knowledge stays with the giver while it enriches the receiver." (1998, in Nelson, 2000: 137). As it is a goal of the RWG to see the knowledge created by its members used and reused in practice, it is very pleasing to find that this is occurring.

7. Conclusion

The RWG is tasked with building a culture of research and professional reflection in the library's professional staff. Many KM tools, as identified by our audit, have been used in this process, from human-centric activities such as seminars and peer assistance to IT tools like file sharing and docuwikis. Interviews with past and current members of the RWG found evidence of knowledge creation, sharing and reuse. Participants described how that they have created new knowledge, not only on their research topics but also about the research process itself. Analysis of their interviews also elicited three tiers of knowledge sharing: within their own research groups; internally, with peers in the RWG and the library; and externally, with others in the profession. And evidence of knowledge reuse was also found amongst participants, although this study does not capture all reuse outside the RWG.

Building a culture of research is an ongoing endeavour. However, knowledge management tools have given us a strong foundation on which we can continue to build. Introducing further tools as the research culture develops will help us sustain our ability to create, share and use our research knowledge for the benefit of the Library and the University.

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