THE USE OF TECHNOLOGY-BASED MECHANISMS AND KNOWLEDGE MANAGEMENT TECHNIQUES IN LIBRARY PRACTICES IN AN ACADEMIC ENVIRONMENT: A CASE STUDY

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Abstract

In response to the knowledge-driven economy, many academic libraries have adopted knowledge management (KM) techniques in the provision of services. KM techniques have been implemented in commercial and business environments towards operational advantages and financial gains. However, there is uncertainty about whether the use of KM principles and technology-based mechanisms could partly solve the academic library's approach to improving its quality of service and fulfil its mandate to its community in the modern information environment. Using a case study approach, this study considered the use of technology-based mechanisms and KM techniques in library practices in order to enhance performance and improve the quality of service in the Metropolitan College of New York (MCNY) library. Data were collected with the use of a questionnaire, interviews, observation and institutional documents. The findings of this study indicate that KM concepts were not universally understood at MCNY, and that library practices were not based on KM, but that they were adopting such KM practices as using social networking media for the purpose of collaboration and sharing knowledge.

KEYWORDS

Academic library, case study, cloud computing, information technology, knowledge management, social networking, Web 2.0

1 INTRODUCTION

The current fast-changing information environment, where librarians serve the same groups of library users who consume the products of the retail, entertainment and mass media industries, has resulted in the need to focus more on creating library spaces that are inviting, dynamic and exciting for those library users. As a result, library services are moving from being solely service-oriented to being value-oriented (Sarrafzadeh, Martin & Hazeri 2006). Adopting knowledge management (KM) techniques, with their focus on enhancing performance, may partly assist academic libraries to add value to the services that they provide. The research of Maponya (2004) and that of Wen (2005) underscores the need for academic librarians to be involved in KM activities such as creating, capturing, sharing and utilising knowledge to achieve the library's goals.

This article explores how knowledge management techniques may be used in academic libraries to achieve academic and organisational goals. It starts by explaining some of the technology-based mechanisms that support KM and KM techniques, and then considers the implications of having a KM focus in an academic library, using data gathered in 2009 from the Metropolitan College of New York (MCNY) library.

2 TECHNOLOGY-BASED MECHANISMS AND KNOWLEDGE MANAGEMENT TECHNIQUES

Technology-based mechanisms "enhance and enable knowledge generation, codification (know-how), and transfer" (Ruggles 1997:8). Ngulube and Lwoga (2007: 121) confirm that the mechanisms "provide strategies that may be used to manage and integrate both tacit and explicit knowledge". Using them is intended to ease the burden of work and to allow resources to be utilised efficiently to accomplish the tasks for which they are most appropriate. In the fast-changing information environment of the 21st century, the use of the modern available computer technologies makes it easier to manage knowledge than the manual ways which were prevalent before the advent of the information society.

Technology is an expeditor but people and processes are still vital (Schwarzwalder 1999). Put differently, it is librarians who

> create the environment necessary to publish content and to develop knowledge communities around content. This isn't as simple as buying an Integrated Library System (ILS) and bolting on social tools. (Green 2008:13)

The importance of IT as an expeditor of KM practice in organisations, and particularly in academic libraries, is confirmed by many library and information science researchers including Abell (2000), Jain (2007), Maponya (2004), Rowley (2003), Singh (2007), Townley (2003) and White (2004).

To a large extent, information technology (IT) is the tool of choice to make KM easier (Abell 2000; Jain 2007; Ngulube & Lwoga 2007; Singh 2007; Townley 2003) because it is convenient in maintaining explicit knowledge. It is "a key enabler in KM, but is not KM in itself. It is a facilitator to provide faster access to knowledge or to share/transfer it among individuals" (Singh 2007:175). IT provides academic libraries the possibility of exploring innovative ways of networking and becoming value-oriented. In addition to personal computer workstations, access to the library has now become possible with the use of most mobile telecommunications devices, so long as they have connectivity to the Internet.

Most of the operations that happen in the library, that is the generation, access, storage and analysis of data, usually in the form of facts and figures, are handled by information management platforms. However, Ruggles (1997:3) points out that information management platforms do not capture the complexity of context and the richness of knowledge and are not robust enough to truly facilitate KM. Technology-based tools that encompass social media have capabilities of sharing and disseminating knowledge and handling the intricacies of managing knowledge. Thus, Web 2.0 social networking media and collaboration tools such as blogs, real simple syndication (RSS) and chat have elevated the role of technology in managing KM to unprecedented levels (Anderson 2007; Carpenter & Steiner 2005; Coyle 2007; Harris & Lessick 2007).

Social media and collaboration tools in a library environment may include intranets, groupware, Google Books, Google Notebook, Google Docs, Lotus Notes, Microsoft Exchange, Business Objects, Google Mail, Twitter, Facebook, MySpace and Delicious.com. These tools facilitate the sharing, gathering and retrieval of information, and allow its storage.

Social networking technologies have made librarians think about where and how those technologies may best be used. Green (2008:10) suggests the creation of "social libraries" as places where traditional library practices and modern KM technologies may operate together for collective social wisdom. This is much like the *Ba* concept of Nonaka, Toyama and Konno (2000), which refers to the creation of a context for knowledge creation. With the development of Internet applications, the focus is shifting away from the question of which devices can effectively store data and are able to run applications, to which devices provide the easiest access to data and applications which are stored at various places on the Internet (Abram 2010).

Another platform that may be exploited to run applications and facilitate collaboration and sharing of knowledge in a distributed environment without incurring huge costs is cloud computing. Cloud computing refers to the delivering of hosted electronic services over the Internet. In other words, cloud computing is

> the sharing and use of applications and resources of a network environment to get work done without concern about ownership and management of the network's resources and applications … data are no longer stored on one's personal computer, but are hosted elsewhere to be made accessible in any location and at anytime. (Scale 2009:10)

In an environment where there are financial constraints, the question of the cloud saving the library money and resources by using computing devices more efficiently becomes central. This leads to the need to understand the ways that modern library users interact with the cloud, and how library services may need to be modified to fit into the emerging user patterns. These user patterns have a bearing on the collaboratory work of faculty and librarians, particularly where faculty uses course management systems such as Moodle, Blackboard or WebCT which have Web 2.0 capabilities and are amenable to the integration of KM techniques.

There is a possibility of blending KM practices with cloud computing and Web 2.0 (Yang & Tate 2009). Using Web 2.0 platforms, such as delicious.com, that accommodate cloud computing in the library, librarians can invite each other into specified closed networks, add useful resources to them in a non-formal but constructive way and, in the process, be accumulating knowledge for practical use as well as inherently tapping the knowledge in the heads of individuals.

Librarians are also concerned about how libraries can use the cloud to both personalise and localise the user's information-seeking experience (Abram 2010). In other words, librarians are no longer seeing themselves as "just custodians or gatekeepers of information" (Kim 1999). They want to move a step further by adding value to their organisations. A good understanding of the meaning of KM application to libraries is therefore essential in order to enhance the quality and value of library services.

Last but not least, knowledge management techniques encompass documenting both explicit and tacit knowledge, building knowledge repositories, organising internal conferences and symposia, using social software for knowledge sharing and transfer, using e-mail, shared file systems and documentation storage, mentoring and training programmes (Srikantaiah & Koenig 2000). To put it another way, practices or techniques make it possible for ideas to be translated into action in the process of accomplishing job functions. Townley (2003:9) suggests that "successful knowledge management techniques are applied selectively to strategically important efforts that show promise of attaining significant organisational objectives".

3 THE PLACE OF KM IN LIBRARY PRACTICES

Discussing KM in library practices indicates a shift from a focus on the traditional processes of face-to-face reference services, cataloguing and classification of documents, as well as circulation desk duties, to practices rooted in the sharing of knowledge through communication and collaboration. It also suggests taking advantage of the tools available in the modern information environment which may not necessarily have been originally created for KM, but expedite its practice. KM practices are viewed as having the potential to make libraries more relevant to their parent organisations and their users

(Sarrafzadeh, Martin & Hazeri 2006). KM practices include the understanding of KM that is inclusive of knowledge generation, acquisition, organisation, storage, transfer, sharing and retention (Jain 2007; Jashapara 2005; Nonaka, Toyama & Konno 2000; Rowley 2003).

4 STATEMENT OF THE PROBLEM AND RESEARCH QUESTIONS

The problem statement can be expressed as the fact that the MCNY library was trying to find ways of enhancing the library's approach to improving its quality and value of service to its community in the modern information environment. This was perceived as having the possibility to partly assist the MCNY, as well as academic libraries in general, to add value to the services they provided. There was uncertainty about whether adopting technology-based mechanisms and KM techniques, with their focus on enhancing performance, could partly provide an answer. The primary research questions that guided the objectives of the study were:

- What methods are used for knowledge assessment, knowledge acquisition and knowledge transfer at the MCNY library?
- What technology-based mechanisms and KM techniques are used for knowledge assessment, knowledge acquisition and knowledge transfer at the MCNY library?

To ask these questions in an investigative form, a questionnaire (Appendix A) and an interview schedule (Appendix B) were used to collect data for the research.

5 RESEARCH METHODOLOGY

Using the MCNY library, this study adopted a case study approach. While Creswell (2007) and Tellis (1997) see a case study as a research methodology, Stake (2005: 438) views it as "a choice of what is to be studied". We tend to subscribe to the latter view. The research process for this case study was conducted through the use of a questionnaire, interviews, observation and institutional documents. A sample drawn from the MCNY employee community was used for the quantitative phase.

Survey-type sample-size calculation was utilised, meaning that a sample error formula, rather than the power analysis formulae that are usually utilised in experimental research, was used. The decision in selecting the random sample was to have a confidence level of 95 per cent and a 10 per cent (.10) sampling error. The result was a sample of 79 individuals, that is 17.5 per cent, of the entire MCNY employee community. On the other hand, purposive sampling was used for qualitative data collection. All usable questionnaire responses were analysed using the SurveyMonkey online survey software and questionnaire tool and Microsoft Excel. Qualitative data analysis was achieved

through identifying patterns and themes in the collected study data. To make sense of them, there was a need for their synthesis and summarisation.

Results were obtained using the structured observation protocol for 22 days of one-hour sessions of observation. The sessions took place during during the same month that interviews and questionnaire data collection took place, in order to view the situation from different times of the day and week. The protocol was based on the same issues as those of the questionnaire items. The events observed were categorised according to the issues raised in the research questions of this study. Using a checklist of practices that the researcher understood to mean KM practice, it was possible to record whether or not a given behaviour or act occurred. The desired behaviours were clearly defined so that there was no question to the researcher/observer as to whether or not they occurred. The fieldwork involved counting how many times a particular behaviour occurred.

The institutional documents studied included the library handbook, the library annual report of 2009 and the internal MCNY Self-Study of 2009 for their content, as well as the MCNY archive for the origins of the library. Additionally, the library website and its content were closely studied.

6 RESULTS AND DISCUSSION

While data were collected from all the sources that had been concurrently utilised, the presentation of the results did not necessarily follow the actual sequence of the questions in the questionnaire and interviews, or those of the issues addressed by the structured observation. Instead, results from the research questions were organised into categories that could appropriately address the objectives of the research. The results indicate that some respondents did not know or realise the difference between documents and assets, information and knowledge, and did not view information and knowledge as institutional assets.

6.1 Response rate

A total of 40 web-based questionnaires out of 79 were completed. This was 50.63 per cent of the total sample. The response rate was consistent with the findings of Greenlaw and Brown-Welty (2009) who found that 51.58 per cent from a web-based survey tool was higher than many of that type of survey as reported in literature. In another study, Leysen and Boydston (2009) found that a web survey attracted a response rate of 51.7 per cent. One of the weaknesses of a low response rate is that it is difficult to confirm the validity of the conclusions beyond the current study. Information from other data collection methods used in this study was therefore used to complement the data from the questionnaire, to enhance the validity of the study.

6.2 Methods used for knowledge assessment, acquisition and transfer at the MCNY library

Research results revealed that knowledge in the library and the college was distributed in both formal and informal ways. The library also assigned experienced individuals to student interns and work study students to help them find their way in the duties assigned. Observation results reflected the ability of librarians to rotate duties on a limited scale in order to distribute and share their know-how. Figure 1 shows observable events that are tools that the library used in knowledge acquisition and generation, to enable its transfer. These include meetings, brainstorming sessions, reports, use of a wiki and workshop attendace, seminars and webinars. The provision of information literacy and library orientation classes was used as a tool for knowledge exchange across individuals in the various organisational levels.

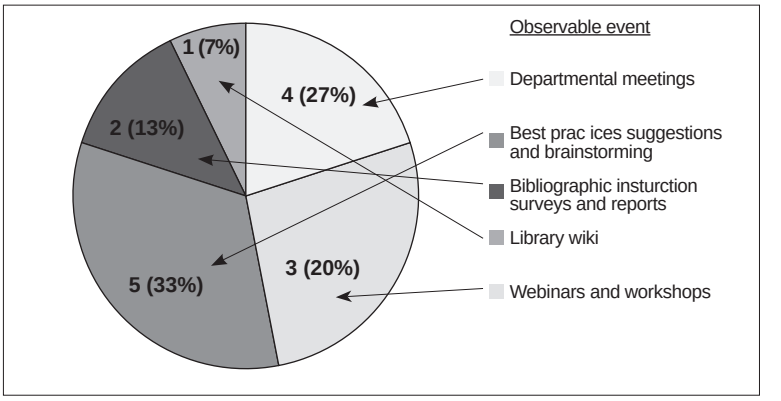


Figure 1: Observable knowledge generation events

MCNY library employees also acquired knowledge through professional networks and membership of associations such as the Association of College and Research Libraries (ACRL), the American Library Association (ALA) and the New York Link organisation (NyLink). In addition, the MCNY library consulted with experts when important skills or information were not available in-house.

The library had up-to-date handbooks and guides which were frequently used, and library employees were always informed of changes in the procedures. Besides documenting the specific knowledge and skills of its individual members, the library appeared to consider competing sources of information and knowledge, such as Google and Wikipedia, as sources of inspiration for developing new methods of service provision or enhancing the current service, and it regularly used the already mentioned brainstorming sessions for problem solving.

The idea behind these practices was that new ideas led to the redesign of work methods and processes in the library. These efforts were a result of employees' perceptions of knowledge transfer.

The question of the impact of knowledge sharing on individuals revealed that respondents felt that it enabled their quick accomplishment of tasks as evidenced by 29 (71%) who agreed, while five (12%) gave no opinion, and seven (17%) disagreed. They also felt that it improved their job performance as highlighted by 30 (73%) who agreed, while six (15%) gave a non-committal response, and five (12%) disagreed. Among the respondents, 30 (73%) agreed that it was generally useful in their jobs, while eight (20%) were ambivalent, and three (7%) disagreed with that perception. Responses indicated that knowledge sharing enabled individuals to react more quickly to change, as reflected by 28 (68%) who agreed, while nine (22%) gave no opinion, and four (10%) disagreed. These results are depicted in Figure 2.

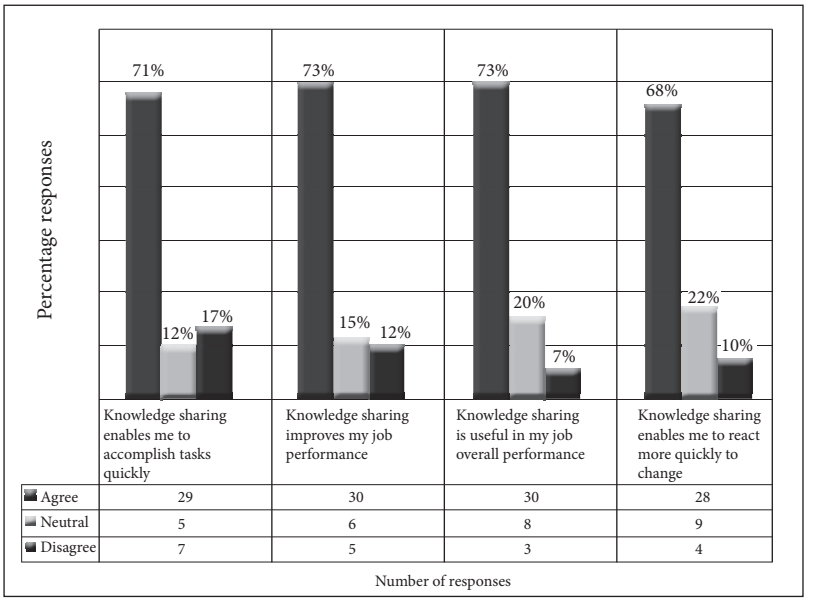


Figure 2: Environment for sharing of knowledge and the individual in a department

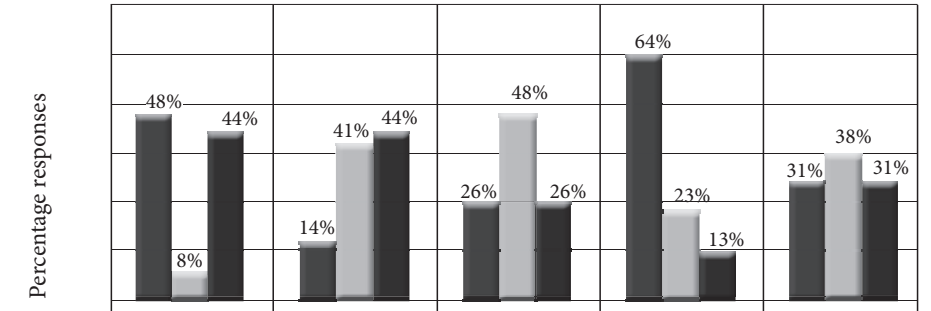
6.3 Technology-based mechanisms used for knowledge assessment, acquisition and transfer at the MCNY library

Interviews, observations and questionnaire results showed the existence of computers in all departments. Access passwords were used to ensure security depending on staff category and responsibilities. Additionally, the library used a conventional Integrated Library System (ILS) (powered by SirsiDynix) and library personnel were trained on its management.

The results revealed that each employee had an e-mail address for business communication; computers in offices were used to create records; Microsoft Office was the commonly used software to create records; employees in the college shared their knowledge/

know-how with colleagues and others in limited ways through Web 2.0 platforms; and the knowledge in the library and the college was sometimes distributed in informal ways through social networking, but normally in formal ways through e-mail. To this effect, there appeared to be several places that one could access knowledge from, but not necessarily in a central place. These ranged from paper-based sources, the heads of individuals in the departments, a central information system, individual personal computers, and departmental computers. While 19 (48%) agreed that knowledge was found in paper-based documents, three (8%) did not commit to an opinion, and 17 (44%) did not agree. Among the respondents, 17 (44%) disagreed that knowledge was in the heads of departmental members, while 16 (41%) were ambivalent about that perception, and six (14%) agreed with it. However, 25 (64%) were of the perception that the knowledge they needed to perform their job functions was on their personal computers or workstations, while nine (23%) opted not to give an opinion and five (13%) disagreed.

A significant number of 19 (48%) did not give an opinion about knowledge being kept in a central storage space, although ten (26%) agreed and another ten (26%) disagreed with that perception. At the same time, 12 (31%) agreed, while 12 (31%) disagreed, that knowledge storage was done on all computers in the departments they worked in, and 15 (38%) gave no opinion. A non-committal response seemed the most popular concerning the availability of knowledge in a central information system, as indicated by 19 (48%) not committing themselves to an opinion, while ten (26%) agreed and ten (26%) disagreed. The results are demonstrated in Figure 3. However, some of the questions and needs expressed in the library, as indicated during interviews and observation sessions, showed that several employees faced challenges such as lack of computer skills, lack of knowledge about capturing metadata, hardware and software dependency, and problems coping with changing technology.



	In paper-based documents	In the heads of my department members	In a central information system	On my personal computer or workstation	On all computers in the department
Agree	19	6	10	25	12
Neutral	3	16	19	9	15
Disagree	17	17	10	5	12

Number of responses

Figure 3: Places where knowledge was stored

The interviews and observation techniques revealed that most academics used social networking accounts such as Twitter, Facebook, MySpace and Delicious. Social networking platforms were used to chat with friends. The chats were said to be of a general nature and not to have any significant bearing on their daily activities at work, or in knowledge sharing. The existence and use of these platforms provides a window of opportunity for librarians at MCNY to exploit these tools to create a culture of knowledge sharing and transfer. Although social networking tools are not necessarily KM practices, they have the potential to facilitate collaboration and build social capital and trust that can lead to the development of KM initiatives.

7 CONCLUSIONS AND RECOMMENDATIONS

The research findings in this case were the premise on which the conclusions were made. Leedy and Ormrod (2010:296) point out that "the conclusions should be entirely supported by the data presented". Only the conclusions from the major findings that directly addressed the research questions are discussed.

The findings of this study indicate that a systematic analysis of the college's KM capabilities did not exist. The college also did not have a KM strategy. However, employee perceptions expressed in Figure 2 seem to suggest that they are amenable to the introduction of KM initiatives due to their appreciation of the benefits of knowledge sharing and transfer. Indications from Figure 3 are that many individuals believed that MCNY's knowledge is mostly either in paper-based documents or on their personal computer workstations.

The study indicated that IT platforms for actively participating in KM activities were underdeveloped. Web 2.0 platforms such as Facebook, Twitter and Myspace were found to be in use, but no evidence indicated that they were enhancing the value of the library, or knowledge sharing. The library had an ILS as an example of an organised platform for accessing information and documents.

The college and the library did not have a central knowledge repository. However, knowledge sharing and transfer through online and face-to-face exchanges, both formal and informal, was encouraged. This research suggests the need for KM strategies that include participating in the establishment and maintaining of a document repository. While a repository helps maintain consistency if faculty and librarians have access to it, that reveals teaching/instruction content, patterns and progression from year to year, a knowledge portal is a platform that enables linkages to the said repositories in a unified, seamless way.

It has been recognised that modern library users are comfortable using the spaces provided by information-based industries (Anderson 2007; Harris & Lessick 2007). Collaborative, interactive workspaces have become relevant in this information environment (Anderson 2007; Sadeh 2008) and librarians have to find ways of making use of the new technologies to everyone's best advantage. An important recommendation is for the library to have a combination of the traditional and the Web 2.0 worlds to

facilitate and provide access to professionally evaluated, high-quality electronic material, including open access information. The state of the library service at MCNY is such that these are concepts that could result in increased value in service provision. A blend of strategies (Nonaka & Takeuchi 1995) is perceived to be the ideal but requires the involvement of more individuals than library personnel alone.

The results of this study are suggestive of the fact that the academic library has to find out how the use of KM techniques (or lack thereof) affects the ability of all those involved in library services to meet intended goals. In that regard, a knowledge mapping or knowledge gap exercise to identify organisational knowledge assets, as well as knowledge gaps, as suggested by Jain (2007), is recommended. In the context of MCNY and its library, this type of exercise has the potential to help in the eventual measuring of the effectiveness and success of implementing KM techniques. Participating in the enhancement of the knowledge environment could be a way for the library to be involved with any KM plans by the college.

An important recommendation is for the library to consider actively using KM techniques to help the parent organisation refocus on using its already existing knowledge. That can enhance the creation of an environment for innovation, rather than remaining limited to best practices solutions only. Technology-based mechanisms and KM techniques may facilitate the creation of knowledge portals and a movement away from silos of knowledge in the college. Portals promote interconnectedness among departments, employees and systems. This "can lead to better decision-making capabilities, reduced 'product' development cycle time (for example, curriculum development and research), improved academic and administrative services, and reduced costs" (Kidwell, Van der Linde & Johnson 2000:31). It therefore follows that one can suggest that formally created methodologies or policies for using KM techniques have the potential to help define or alter the work culture, and make practice both systematic and systemic.

A conclusion arising from this article is that library practice based on the use of KM techniques can encourage the thorough study of library and information variables, their measurement and evaluation and the creation, retention and dissemination of knowledge. This appears to be more encompassing and comprehensive than focusing only on circulation, technical services, or reference, especially if librarians are involved with curriculum-related issues too.

Another conclusion is that, if a KM approach is adopted or considered by the library, it is important for the library to go through the process of KM so that its role transforms into one of managing knowledge, participating in facilitating knowledge flow within the academic institution, and giving strategic advantage to the value-generating capacity of the library as well as the entire institution. This is because knowing or being aware of KM concepts needs to be accompanied by actual action and practice. It is also important to realise that any plan to include KM techniques in the library creates a need to understand the patrons that the library serves, especially in view of the use of modern, fast-changing information technology.

Finally, one can conclude that with the use of the recommendations from this study, KM should not be regarded as a solution, but as a way to better use the expertise and knowledge within and available to MCNY, and more specifically to the library. Additionally, any consideration by the library to use KM techniques requires careful and detailed study into their pragmatic use, with the aim of enabling and supporting the entire college to use the available intellectual capital to its advantage.

REFERENCES

Abell, A. 2000. Skills for knowledge environments. *The Information Management Journal* 34(3):33–41.

Abram, S. 2010. It's 2010: technologies to watch, and how to cope. http://www.slideshare net/stephenabram1/click-u2010 (Accessed 2 May 2010).

Anderson, P. 2007. What is Web 2.0? Ideas, technologies and implications for education. *JISC Technology and Standards Watch*. http://www.jisc.ac.uk/media/documents/techwatch/tsw0701b.pdf (Accessed 22 August 2009).

Carpenter, C & Steiner, S. 2005. Using Web 2.0 technologies to push e-resources. http://smartech.gatech.edu/bitstream/1853/13640/2/236-fri-11_05.pdf (Accessed 1 February 2008).

Coyle, J. 2007. WIKIS in the college classroom: a comparative study of online and face-to-face group collaboration at a private liberal arts university. PhD thesis, Kent State University College, Oh. http://www.ohiolink.edu/etd/send-pdf.cgi/Coyle,%20James%20E.,%20Jr..pdf?acc_num=kent1175518380 (Accessed 2 February 2008).

Creswell, JW. 2007. *Qualitative inquiry and research design: choosing among five approaches.* Thousand Oaks, CA: Sage.

Green, P. 2008. Social libraries: the next generation of knowledge management. *Information Outlook* 12(12):10–15.

Greenlaw, C & Brown-Welty, S. 2009. A comparison of web-based and paper-based survey methods: testing assumptions of survey mode and response cost. *Evaluation Review* 33(5):464–480.

Harris, A & Lessick, S. 2007. Libraries get personal: Facebook applications, Google gadgets, and MySpace profiles. *Library Hi-Tech News* 24(8):30–32.

Jain, P. 2007. An empirical study of knowledge management in academic libraries in east and southern Africa. *Library Review* 56(5):377–392.

Jashapara, A. 2005. The emerging discourse of knowledge management: a new dawn for information science research? *Journal of Information Science* 31(2):136–148.

Kidwell, JJ, Van der Linde, KM & Johnson, SL. 2000. Applying corporate KM practices in higher education. *Educause Quarterly* 4:28–33.

Kim, S. 1999. The roles of knowledge professionals for knowledge management, in *65th IFLA Council and General Conference*, Bangkok, Thailand, August 20-August 28, 1999. IFLA Conference Proceedings. Code number 042-115E, Meeting number 115, IFLA.

Leedy, PD & Ormrod, JE. 2010. *Practical research: planning and design*. Upper Saddle River, NJ: Pearson.

Leysen, JM & Boydston, JMK. 2009. Job satisfaction among academic cataloger librarians. *College & Research Libraries* 70(3):273–297.

Lynch, BP & Smith, KR. 2001. The changing nature of work in academic libraries. *College & Research Libraries* 62(5):407–420.

Macgregor, G & McCulloch, E. 2006. Digital directions: collaborative tagging as a knowledge organisation and resource discovery tool. *Library Review* 55(5):291–300.

Maponya, P. 2004. Knowledge management practices in academic libraries: a case study of the University of Natal, Pietermaritzburg Libraries. http://www.ukzn.ac.za/department/data/leap_scecsalpaper.pdf (Accessed 20 February 2008).

McManus, D & Loughridge, B. 2002. Corporate information, institutional culture and knowledge management: a UK university library perspective. *New Library World* 103(9):320–327.

Ngulube, P & Lwoga, E. 2007. Knowledge management models and their utility to the effective management and integration of indigenous knowledge with other knowledge systems. *Indilinga – African Journal of Indigenous Knowledge Systems* 6(2):117–131.

Nonaka, I & Takeuchi, H. 1995. *The knowledge-creating company: how Japanese companies create the dynamics of innovation*. New York, NY: Oxford University Press.

Nonaka, I, Toyama, R & Konno, N. 2000. SECI, *Ba*, and leadership: a unified model of dynamic knowledge creation. *Long Range Planning* 33(1):5–34.

Rowley, J. 2003. Knowledge management – the new librarianship? From custodians of history to gatekeepers to the future. *Library Management* 24(8/9):433–440.

Ruggles, RL. 1997. Tools for knowledge management: an introduction, in Ruggles, R (ed). *Knowledge management tools*. Boston, MA: Butterworth-Heinemann:1–8.

Sadeh, T. 2008. User experience in the library: a case study. *New Library World* 109(1/2):7–24.

Sarrafzadeh, M, Martin, B & Hazeri, A. 2006. LIS professionals and knowledge management: some recent perspectives. *Library Management* 27(9):621–635.

Scale, M-SE. 2009. Cloud computing and collaboration. *Library Hi Tech News* 26(9):10–13.

Schwarzwalder, R. 1999. Librarians as knowledge management agents. *EContent* 22(4):63–65.

Singh, SP. 2007. What are we managing – knowledge or information? *VINE: The Journal of Information & Knowledge Management Systems* 37(2):169–179.

Srikantaiah, TK & Koenig, M (eds). 2000. *Knowledge management for the information professional*. Medford, NJ: American Society for Information Science.

Stake, RE. 2005. Qualitative case studies, in Denzin, NK & Lincoln, YS (eds). *The Sage handbook of qualitative research*. Thousand Oaks, CA: Sage:121–135.

Tellis, W. 1997. Application of a case study methodology. *The Qualitative Report* 3(3). http://www nova.edu/ssss/QR/QR3-3/tellis2.html (Accessed 3 February 2008).

Townley, CT. 2003. Will the academy learn to manage knowledge? *Educause Quarterly* 2:8–11.

Weerasinghe, S. 2006. Knowledge management: challenges for the special librarian, in Khoo, C, Singh, D & Chaudhry, AS (eds). *Proceedings of the Asia-Pacific Conference on Library and Information Education and Practice 2006 (A-LIEP 2006)*, Singapore, 3–6 April. Singapore: School of Communication & Information, Nanyang Technological University:550–554.

Wen, S. 2005. Implementing knowledge management in academic libraries: a pragmatic approach. *Chinese Librarianship: an International Electronic Journal* 19. http://www.white-clouds.com/iclc/cliej/cl19 htm (Accessed 4 December 2009).

White, T. 2004. *Knowledge management in an academic library: based on the case study "KM within OULS"*. Paper presented at the 70th IFLA General Conference and Council, Buenos Aires. http://www.ifla.org/IV/ifla70/papers/089e-White.pdf (Accessed 26 April 2009).

Yang, H & Tate, M. 2009. Where are we at with cloud computing? A descriptive literature review. *20th Australasian conference on information systems* 2–4 Dec, Melbourne.

APPENDIX A: QUESTIONNAIRE

1. Do you consent to participate in this survey?
   Yes No

2. What staff category do you belong to? (Please select as appropriate)

Staff category	
Faculty full-time	
Faculty part-time	
Administrative staff	
Non-administrative staff - full time	
Non-administrative staff - part time	

3. If you are non-faculty, do you work for the library?

Yes	
No	

4. For how many years have you held that position at MCNY?

Less than 1 year	Up to 3 years	Up to 5 years	More than 5 years

5. The relationship between knowledge and information is that

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
They mean the same thing					
Knowledge depends on information					
Knowledge management is the same as information management					
Knowledge management includes information management					
Information use can lead to knowledge creation					

6. What is your perception on the environment for sharing of knowledge in your department?

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
It facilitates knowledge creation					
It facilitates knowledge storage					
It facilitates knowledge retrieval					
It facilitates knowledge transfer					
It enables me to accomplish tasks quickly					
It improves my job performance					
It is useful in my job overall					
It enables me to react more quickly to change					
It speeds decision making					

7. What is your perception on the environment for sharing of knowledge at MCNY?

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The specific knowledge that I need is found only among experts at MCNY rather than in a central location					
The concept of knowledge is difficult to clearly articulate					
The knowledge stored in a central location cannot be directly applied without extensive modifications because of the fast-paced dynamic environment that my department operates in					
As the tasks of my department change frequently, I am always having to seek new knowledge that is not directly available in the MCNY databases or on the shared computer drive					
I am able to extensively re-use knowledge from the shared drive after making a few changes to adapt the retrieved knowledge to the current situation					
The knowledge that I find in the shared drive can be applied to current situations with little or no need to seek out or create new knowledge					

8. Do you think the members of your department are

Statement	Strongly agree	Agree	Neutral	Disagre	Strongly disagree
Satisfied by collaborating to accomplish tasks?					
Supportive for knowledge sharing and creation?					
Willing to collaborate across organizational units?					
Accept responsibility for failure?					

9. I always find

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The precise knowledge I need					
Sufficient knowledge to enable me to do my tasks					
That I am satisfied with the knowledge that is available in my department to use					

10. There should be a reward system for

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Creating reusable knowledge resources					
Reusing existing knowledge resources					
Contributing to a library or collection of reusable knowledge resources					

11. When a colleague asks you to help with their knowledge needs, what type of knowledge is typically sought?

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Essential for business performance					
Essential for the College's competitive advantages					
Important for leading to innovation and/ or creative work					
Outdated and no longer useful for business					

12. Most of the skills and expertise that you have been using in your job for the past 6 months were acquires

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
At MCNY					
Through self-learning					
Through formal training					
At my last job					

13. Most of the knowledge that I need to do my work is located

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
In paper-based documents					
In the heads of my department members					
In a central information system					
On my personal computer or workstation					
On all computers in the department					

14. Knowledge that you acquire in your present job belongs first and foremost to

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
You alone					
MCNY alone					
Depends on how much effort you put into it					
Both yourself and MCNY					

15. To do my work when I am stuck

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I often consult with my divisional supervisor					
I often make use of documented procedures with MCNY					
I often consult with other departments within MCNY					
I often consult with colleagues from other colleges					

16. My biggest barrier to being able to store information that I receive more efficiently and effectively is

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Lack of time/ too busy					
Inefficient technology					
Poor information systems					
Organizational policy/ directives					

17. Sharing of information

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
happens constantly with other departments in the College in formal ways to do my job well					
happens constantly with other colleagues in the College in formal ways to do my job well					
happens rarely with other departments in the College in formal ways to do my job well					
never happens with other departments in the College in formal ways to do my job well					
never happens with other colleagues in the College in formal ways to do my job well					

18. What are the challenges you face in sharing information with people from other departments within the College?

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Colleagues do not seem to perceive that there is an urgent need to share					
I do not see an urgent need to share information					
There is a lack of open-minded sharing environment					
There is a lack of trust of other people's knowledge					
There are no proper organizational guidelines on sharing					
The bureaucratic procedures involved in sharing are complicated					

My tasks do not require cross-department information sharing					
There is no proper IT platform to share information on					
I do not know about other people's knowledge needs					

19. In my department, the following are typical

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Staff development					
Plans for developing staff expertise					
There is regular performance appraisal					
Attending courses, conferences or workshops is encouraged					
Time used for attending courses, conferences, workshops is taken off individual vacation days					
There are mentoring incentives					
Succession planning is in place					
Training always takes place when there are new tools in use, or when the existing tools are changing					

20. My strength lies in

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Flexibility while performing my tasks					
Team skills					
People skills					
Communication skills					
The ability to assess and evaluate information					
Creating, recording and storing information					
Using information retrieval tools such as library databases					

21. Your duties involve using the following skills:

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Lateral thinking, that is, adapting your thinking to suit changing concepts and perceptions about library service					
Thinking in terms of MCNY rather than only the department you work in					
The power to persuade and sell your skills in the context of MCNY					
Managing change rather than merely enduring it					
Advocacy					
Strategic planning					
Project management capacity					

22. The following material needs to be kept in a repository of the College:

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
CA (Constructive Action projects)					
Only the CA projects with good grades					
Annual reports					
Institutional conference proceedings					
Multimedia material					
Student course material					
Library resources					
Other (please specify)					

23. The MCNY library

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
provides user orientation to new faculty					
provides user orientation to new staff members					
needs to be mandated by the College to provide user orientation to new faculty					
needs to be mandated by the College to provide user orientation to new staff members					
needs to be mandated by the College to periodically provide information retrieval and use workshops to all staff members					

24. An information literacy class for students should be a credited course and

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
can be useful if given as mandatory for every student during the first semester upon entry into College					
can depend upon faculty to determine student information needs					
can be provided on a continuous basis					
can be used by the college to determine information literacy gaps among students					
can be effective if faculty and librarians collaborate in providing it					

Thank you for completing this survey. Your time is valuable, therefore your contribution to this study of our library's service is highly appreciated.

APPENDIX B: Interview guideline

Understanding the meaning of knowledge management

a. What do you understand by the term 'knowledge management'?
b. What are the categories of knowledge available at MCNY (categories such as information that you have that you use, or have used, to change the way you fulfil your job responsibilities)?

1. What knowledge do you need to carry out your work?

2. Do you know the number of files in the system that are relevant to your work?
   a. What knowledge retention policies are in existence at MCNY?
   b. What knowledge practices are you aware of as being in existence at
   c. What knowledge retention practices are you aware of as being in existence at MCNY?
   d. What knowledge gaps do you notice, that matter towards the fulfilment of your duties?
   e. Is there new knowledge created in the process of doing your job duties?
   f. Do you use new knowledge collected from external sources?

3. Are you aware of instances of deliberate knowledge creation?
a. Does you department exercise periodic knowledge contribution in the shared drive
b. What modern technologies are in use at MCNY that enhance the environment for KM practice?
c. What are the tools, methods and techniques used for knowledge retention

d. What are the tools, methods and techniques used for knowledge assessment in your department?
e. What are the tools, methods and techniques used for knowledge acquisition in your department?
f. What are the tools, methods and techniques used for knowledge transfer in your department?
g. What recommendations on implementing KM practices that enhance the value of library service at MCNY can you suggest?

Human capital analysis

a. Are you aware of expert categories of staff at MCNY?
b. Do you see staff placement as related to their expertise?
c. Does your department have expert database – existing vs. future development
d. Is there a concept of succession planning at MCNY and specifically relating to the library
e. How is knowledge of experts who are leaving MCNY captured, and do any procedures or plans to do so exist?
f. Are there any plans for the development of external industry experts or databases?
g. Does MCNY have plans for expert knowledge sharing on regular basis?
h. Does MCNY have plans in place for the development of best practices, using experts?