

Watch this Space!

Designing a New Library for Macquarie University

Maxine Brodie
University Librarian
Macquarie University
maxine.brodie@library.mq.edu.au

Abstract:

Macquarie University is implementing a number of inter-related long-term strategies to deliver a new-generation library service that is client-centric rather than library-centric. In response to changing client expectations and to our University's new strategy, we are making significant changes to service delivery, by redefining staff roles and our organisational structure, and by rebuilding our physical and electronic presence. This paper, one of a series, focuses on changes to the Library's physical presence, and provides the background to the decision to construct a new client-centred library building that reaffirms the Library's centrality to research and learning. This paper provides a high-level overview of the key design concepts and the design process, including the utilisation of automated storage technologies to maximise the space available for clients.

Background, 1967-2005

Macquarie University was founded in 1964 as a second-generation Australian university with a focus on conducting interdisciplinary research and teaching in the sciences, social sciences and humanities. In 1967, Macquarie University opened Stage 1 of its Library right in the centre of the campus to symbolise the centrality of library and information services to research and learning. Our first Vice-Chancellor, Professor Alex Mitchell, was committed to the “unity of knowledge” as the basis for interdisciplinary research and teaching at Macquarie. Not only did he ensure that the Library was built in the centre of the campus, but also that the University’s governing principles permitted no branch or separate subject libraries to be created. With the strong support of subsequent Vice-Chancellors, the Library has been able to remain essentially a single main Library on a single physical campus for the last forty years.

The University has changed in both size and character during that time. At the end of 1967, Macquarie had 1,200 enrolled students, in 1977 there were 10,346, in 1987 10,883, in 1997 18,902 students and in 2007 we have more than 31,000 enrolled students. Much of the expansion in the last ten years has been in postgraduate studies and in international on-campus students - one-third of our enrolled students are postgraduates and one-third are from countries other than Australia. The rapid expansion in student numbers has placed a lot of pressure on Library facilities. The Library was originally designed to be built in five stages to accommodate growth and changing needs. Stages 1-4 were built between 1967 and 1975, creating a gross area of 20,000 square metres (approximately 13,500 square metres occupied by the Library and the balance by the Centre for Flexible Learning). Plans to extend and refurbish the Library in Stage 5 began as early as 1987, but did not eventuate in the financial climate of the early 1990s. The proposed extension was to complete the original design by adding around 5,000 square metres of space. The challenge, as is always the case in universities, was to find the funding required to build the extension and to update the core electrical and mechanical systems in the building.

In 1967, there were no personal computers and very few online journals. Over the last forty years, the Library has also radically changed the way it delivers resources and services. The Library has 124 full-time equivalent (FTE) staff and an annual budget of \$16 million. Two thirds of our annual acquisitions budget is spent on electronic resources. We currently provide access to 1.8 million physical items, 50,000 subscription electronic journals 30,000 open access journals and 22,500 eBooks. This transformation, initiated by Neil McLean as University Librarian, has taken place in less than ten years – in 1999, we provided access to 2,500 electronic journals and no eBooks. The Library is open 82 hours a week during semester and receives 5,500 physical visits and 5,500 website visits each day of the year – so half of our business is now electronic, with the resources supported by services such as Ask a Librarian. The Library is also home to the Lachlan Macquarie Room, the *Lachlan and Elizabeth Macquarie Archive* and several special collections.

In 2000, an award winning co-generation plant was constructed as an extension to the lowest level of the Library on its northwest corner to assist in power generation and management for the central part of the campus and as part of the University’s growing commitment to sustainable operations. This plant is now also used to heat the swimming pools recently opened in the Gymnasium complex. Completion of the co-generation plant revitalised discussions about the Library Project in 2001/02, as

maximum value could be gained from this plant if the Library building reached its intended size. By this time Penny Carnaby, now the National Librarian in New Zealand, was the University Librarian at Macquarie and I joined as her Deputy at the end of May 2002. Penny was keen to explore the nature of the “next generation” academic library, particularly in relation to the emerging concepts of the “learning commons” rather than the “information commons”. In September 2002, the University Council approved the inclusion of \$32 million in the University’s Capital Plan for refurbishment and extension of the Library. Penny encouraged Library and University staff to consider a broader brief than just “library business as usual”. Using her first hand experience of “next generation” developments in New Zealand, Penny led a study tour for senior University staff, including the Vice-Chancellor and the Chair of Library Committee, to visit the new Information Services Building at the University of Otago and the new Library at Christchurch Polytechnic. In 2003, discussions began on the nature of a “learning commons” at Macquarie, but by then Penny had taken up her new role in New Zealand and I had been appointed as University Librarian in February 2003.

Two alternative building concepts were explored between the end of 2002 and 2004, with extensive research into developments in Australia and overseas. The first was based on an expanded “learning commons” concept, which required provision of accommodation for a number of other organisational units. This alternative proved unworkable on the site and was never fully costed. The second was proposed by specialist planners, MoveCorp, and was based on the most effective storage of the print collections and the minimisation of collection moves during construction and refurbishment. We had worked with MoveCorp during 2003/4 to develop a Facilities Master Plan for the Library. This plan included a “steady state” model for the collection and appropriate standards for its storage and management. This second alternative was costed at \$40 million to build an additional, linked 10,000 square metres to the west of the existing building and \$30-35 million to refurbish the existing building, thus providing a total gross area of almost 30,000 square metres. The need to double the size of the proposed extension arose from changes to the Building Code of Australia (BCA). The original 5,000 square metres would have allowed us to respace and rehouse our physical collections to meet the BCA, or to create additional seating space for students, but not both. The proposed 10,000 square metre extension would have allowed us to meet the BCA for the collection and increase our seating from 1,100 to 2,000 – but not to 3,000, which was the number of seats required to meet the expansion of student numbers projected over the next forty years in the *Campus Redevelopment Plan 2004*. This option essentially meant adding a freestanding but connected “bookstack” to the western end of the existing Library. The concept was considered too expensive, difficult to manage and difficult to market to the Macquarie community because of the perceived focus on building a “bookstack”, when the focus was shifting to electronic resources.

During 2005 we continued to look at overseas developments, particularly those focusing on learning styles and the learning space requirements of the “net generation” (Oblinger, 2003). However, the situation with the mechanical and electrical services in the building was becoming increasingly critical. This led to one last attempt to propose a “survival” strategy to the Building & Grounds Committee of University Council on 9 February 2006. This proposal returned to the original Stage 5 extension concept, but with a full refurbishment of the existing building, as required

under the BCA. This was costed at \$26 million for the extension and \$38.2 million for the refurbishment. The design was a compromise solution providing 1,500 seats and a tight fit for the collections. The Council Committee meeting was the last as Vice-Chancellor for Professor Di Yerbury and the first for incoming Vice-Chancellor, Steven Schwartz. The proposal was not approved at this meeting so that the incoming Vice-Chancellor would have some time to assess the University's capital projects and plans in the light of his overall review and recommendations to Council on the University's new strategic goals.

Strategic Reframing, 2006

An overview of the University's new strategic focus can be found in *Macquarie@50* (Schwartz, 2006). By 2014, our goal is to be among the top eight research universities in Australia and the top 200 in the world. The University is identifying existing and emerging concentrations of research excellence to focus effort and improve performance. There is also a focus on achieving excellence in teaching because of the strong links between research and teaching outcomes.

The Library has reframed its own strategy to meet these goals. Our vision is to be a world leader in the provision of information services to the University community. To realise this vision we need to deliver a new generation library service that is client-centric rather than library-centric. Our *Strategic Plan 2007-09* (Macquarie University Library, 2006) indicates how we will review and develop the resources and services needed to achieve excellence in research and teaching over the next three years. We have already described how we are making significant changes to service delivery by redefining staff roles and our organisational structure (Brodie and Martinelli, 2007). Our task now is to rebuild both our physical and electronic presence for the future.

Our new Vice-Chancellor could not see the wisdom of renovating and extending a building that would still not meet our needs. His challenge to me was: "Find a way to build us a new Library for about the same cost as renovating and extending the old one!" To be client-centric meant finding a solution that would move the focus of the Library Project away from the physical collections and on to the provision of effective learning spaces. Our research showed there was an answer – the use of cost-effective, on-site high-density storage for 80% of our physical collections. We already knew that just 20% of the collection satisfied 80% of the loans – this was mostly material on reading lists in high demand by students. Our choices to maximise space for clients in the new Library were: to weed the collection severely to reduce its size, to relegate a large proportion of the collection to offsite storage, or to utilise high-density, onsite storage. A number of libraries in the US, Japan and Europe now use automated storage and retrieval systems (ASRS) that can store material in about one seventh of the floor space occupied by open access shelving. In July 2006, we visited a number of sites in the US to see such systems in operation. The cost effectiveness of these systems, both in installation and ongoing maintenance costs, was clear. This enabled us to plan for a building of around 16,500 square metres that could provide working space for up to 3,000 students, 150 staff and house the print collection for the next forty years, using a mixture of open access shelving and the ASRS.

In August 2006, as a result of this work, the University Council approved a project budget of \$70 million (excluding GST) and a site to build a new, state-of-the art learning and research centre to replace the existing Library. This new learning and research centre is being designed to meet the needs of researchers and learners for the future and will incorporate an ASRS. It will be located in the central academic precinct, just south of the Library's current location, and is planned to open early in 2010. This project recognises the ongoing importance of the Library to the development and success of the University. As well as providing a cost-effective solution this project has also meant we have successfully answered one major question asked on University campuses around the world: "Why do we need a library when we have Google?"

Planning and Design, 2007

At the August 2006 meeting, University Council also recommended that a number of Australian architectural firms with experience in the design of educational and library buildings be invited to submit designs in a limited competitive design process. CRI Australia Pty. Ltd. was appointed to oversee the Library Building Project, beginning with the conduct of this competitive design process. Early in 2007, a Project Control Group (PCG) was established with members from the Library, the Office of Facilities Management and the Project Managers. One of the first tasks of the PCG was to finalise a Design Brief and to identify architectural firms with the appropriate experience. Invitations were sent to nine leading Australian architectural firms to submit an expression of interest to participate in a limited competitive design process for the Library Building Project. Eight submissions were received, with two of the invitees collaborating in their submission. Five groups were selected on the basis of their submissions to participate in the competitive design process: Ashton Raggatt McDougall, Bligh Voller Nield, Francis-Jones Morehen Thorp, John Wardle Architects / Wilson Architects and Jones Coulter Young.

The final Design Brief was completed and issued to the competition participants on 23 April 2007. This contained detailed information about the site and its relationship to the University's *Campus Redevelopment Plan 2004*, the requirements for submission of a concept design, the selection criteria and the Key Design Principles and an accommodation brief. The Key Design Principles are provided in Appendix 1. The architects were asked to approach the project with a fresh eye and to consider three equally important and related concepts: the Library in its Environment (urban design and sustainability); the Library and People (light, connection, a range of learning spaces); and the Library and Technology (for collection storage and access as well as electronic resources and services).

Two briefing sessions were conducted for the submitting architects during May to clarify the contents of the Design Brief and five concept designs were submitted by 24 May 2007. On 31 May 2007, the nine-member selection panel, consisting of senior staff of the University, a member of Council, two students and an independent adviser, met to evaluate the concept designs submitted. Members of the panel agreed that it was one of the most remarkable working days they had ever spent, watching and listening to highly creative and talented architects turn our words into very different and exciting concept designs for a new Library.

The panel determined that Francis-Jones Morehen Thorp (fjmt) should be awarded the architectural commission for the Library Building Project on the basis of their submission and presentation. In the panel's view fjmt's submission demonstrated a superior response in relation to the criteria for assessment provided in the competitive design process brief and proposed an elegant and timeless design concept that responded to the symbolic objectives for a "new beginning" at Macquarie.

Automated Storage and Retrieval System (ASRS)

Macquarie University will be the first in Australia to install an ASRS for library use. The ASRS consists of an environmentally controlled vault with metal bins stored on high industrial racking either side of aisles, with each aisle served by a robotic crane. This innovative technology, adapted from the automotive industry's application for warehousing and retrieving small components, allows higher density storage resulting in a significantly smaller footprint, and therefore, a more affordable project cost. As noted above we intend to store around 80% of our physical collections in the ASRS and 20% on open access shelves. The Library catalogue will indicate which items are in the ASRS and allow clients to request these items to be collected from a service desk. The item identifier is passed from the Library catalogue to the ASRS inventory system. This inventory system then directs the appropriate robotic crane to retrieve and deliver the bin containing the item to Library staff, who then select the item from the bin and transfer it ready for pick up at the service desk. The retrieval process takes just a few minutes.

There is evidence from other libraries that using the ASRS will actually help us to increase the use of our print collection over time by making access to it more convenient. Academic librarians are familiar with the "missing book" problem – items can be missing because the client does not know how to find them, a client has hidden them, or they are shelved in the wrong place. Use of an ASRS linked to the Library catalogue solves these problems. Use of the ASRS can also be more convenient; for example, a client can make a request for an item to be retrieved from the ASRS from their office or home computer before they come into the Library.

The major reservation clients have about these systems is that it makes browsing much more difficult. However, large open access collections are not easy or comfortable to browse either, and time is becoming a scarce commodity for academic staff and students. We are exploring a variety of ways to augment the online descriptions of books and journals to maximise their visibility and use in both electronic and print formats. In consultation with academic staff, we will also help to mitigate this problem through appropriate choice of the 500,000 items to be placed in the open shelves.

Our ASRS will be housed in a 1,000 square metre vault over four levels and provide storage for 1.8 million items in approximately 18,000 bins. The components of the ASRS itself will cost not much more than the cost of new library shelving in conventional built space and will be an important contributor to our aim to create an environmentally sustainable design for the building.

Environmentally Sustainable Design

One of our Key Design Principles is an “environmentally sustainable design with low maintenance costs and durable finishes”. We are exploring different ways to establish our achievement of this goal in the Project. One possible method is the new Green Star – Education PILOT rating tool. The Green Building Council of Australia suggests that a green building:

- is designed to minimise the total environmental impact of its materials, construction, operation and deconstruction while maximising opportunities for indoor environmental quality and performance.
- is constructed and operated in ways that enhance its impact on the environment and on the building occupants
- will save money, reduce waste, increase worker productivity and create healthier environments for people to live and work (Green Building Council of Australia, 2007)

A Green Star rating reflects how well a building delivers on these goals.

New Library, 2010

Communication and Consultation

We have begun work on a comprehensive Communications and Consultation Plan for the duration of the Project. Several presentations on the Project have already been made to University Council, Academic Senate, Library Committee, Library Friends Foundation Board, academic staff and Library staff. A Project website has been established at www.library.mq.edu.au/about/newlibrary2010 and the Plan will cover the three main phases of the Project: design (2007/08), construction (2008/09) and relocation (2010). During the detailed design phase we intend to conduct extensive community consultation with both internal and external stakeholders, including Library staff, and the staff and students of the University. Library staff have already become involved in the Project by creating their visions for their new Library in a staff competition. Staff have also been actively participating in a staff blog to capture important and creative ideas and input into how the new library should look, feel and operate.

We were also keen for feedback from The University's School Partners, whose Year 10 students will make up some of Macquarie's undergraduate intake in 2010. We have recently completed a “Create your Vision for the 21st Century Library” competition for Year 10 students, who were invited to “Create their Library” incorporating the Key Design Principles of the new Library and addressing at least one of the three important components of the design – the Library in its Environment, the Library and People and the Library and Technology. The winning entries can be found on the Project website. The individual winners received an iPod Nano (sponsored by RefWorks) and the school received a Library access package tailored to their needs.

Inspired by the work undertaken by Susan Gibbons and her team at the University of Rochester (Gibbons, 2007) we have engaged two Sociology 300 students as interns this semester to investigate and recommend effective strategies for involving students in the detailed design of learning spaces in the new Library. In 2008, we will begin a “Library Stories” project to capture the 40-year history of the Library in the current building.

Operational Planning

The Library Building Project gives us an excellent opportunity to revisit all aspects of our operating principles and practices. We are establishing a variety of “New Library 2010” working groups and documents to look at issues as diverse as service models (including a “first point of contact” for students), the management of the collection, technology management, the operation of the proposed Library Café, the operation of the loading dock, occupational health and safety and associated risk management requirements.

In June 2007 we received a grant of \$150,000 from the University’s 2007 Carrick Institute Learning and Teaching Performance Fund distribution to establish a student-centred learning space on Level 1 of the Library. This will provide a flexible area for students to use technology and to work individually and collaboratively. We can use this space as a “sandpit” to explore with students the possibilities for designs of learning spaces in the new Library. A Steering Committee with student and academic staff representation has been established to guide the development and use of this space

Conclusion

To achieve our vision to be a world leader in the provision of information services to the University community we have embarked on a journey to deliver a new generation library service that is client-centric rather than library-centric. To guide our transformational strategies we have established six guiding principles. We believe the Library needs to be:

- **Agile** – able to innovate and be flexible, by creating a focus on service development, staff development and strong project management
- **Resilient** – able to renew and sustain itself
- **Informed** – making decisions on the basis of reliable data, focusing on the collection of appropriate data, research, feedback, evaluation and review
- **Connected** – having close links within its teams and with its community, by focusing on understanding needs and expectations; defining services and service outcomes from a client perspective; good internal & external communication & marketing; representation on key internal & external committees
- **Successful** – delivering excellent, quality service by focusing on: refreshing our quality approach, establishing measures of success from a client perspective, conducting ongoing evaluation of projects and services
- **Responsible** – being ethical, professional, and accountable for providing resources and services that are value for money.

These principles apply to our Library Building Project in a variety of ways, for example: creation of flexible spaces (*agile*); a forty year life span for the building with low maintenance costs (*resilient*); a design guided by best practice (*informed*); a design guided by client input (*connected*); and a final outcome that is environmentally sustainable (*responsible*). The *success* of the building will need to be measured by its use and by our ongoing evaluation and improvement of our services over time. If all goes to plan, we hope to begin construction in the first quarter of 2008 and commission the new Library early in 2010. Watch this space!

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Appendix 1 Key Design Principles

“Forget everything you think you know about academic libraries ...”

1. High profile building symbolising a “new beginning” at Macquarie

The key design concepts for the building comprise:

- light and connection
- strong sense of place

The building design must embody these concepts while providing for the following:

- briefed accommodation
- constraints of the project budget
- strong relationship to the rest of the campus
- the principles defined by the Campus Development Plan 2004

2. Primary focus on client space - learner-centred design

“Where knowledge counts, people count more than ever” (John Seely Brown).

Client “learning” spaces will form the central focus of the new library:

- 3,000 flexible, configurable study spaces based on new approaches to *learning space design* for new generations of students, including *students with special needs, researchers and postgraduate students*; attention to acoustic issues associated with individual v. interaction spaces
- *24/7 operation* –achieved with different building zones and minimisation of separate service points; minimal built in furniture
- wireless network and power *everywhere* for access to digital learning and information environments
- access to food and beverage services
- single, flexible staff area for 150 people (125 FTE)

The following source documents on learning space design and key design questions have been identified by the University as most relevant to their design objectives for the new library building.

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- (ii) Bennett, S. (2007) ‘First questions for designing higher education learning spaces’ *Journal of Academic Librarianship* (33)1, pp. 14-26.
- (iii) Brown, J. S. (2001) “Learning in the digital age” Papers from the Forum for the Future of Higher Education. Available at: <http://www.educause.edu/ir/library/pdf/ffp0203s.pdf>.
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- (v) Council on Library and Information Resources (2005) *Library as place: rethinking roles, rethinking space*. Washington. Available at: <http://www.clir.org/pubs/reports/pub129/pub129.pdf>.
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3. Secondary focus on physical collections

Incorporation of an automated storage and retrieval system (ASRS) for 1.8 million physical volumes to reduce the floor space required by the print collections and improve service delivery (this will be the first installation of its type in Australia) and open access shelving for 450,000-500,000 physical volumes. The open access shelving areas are to be protected by a theft detection system.

- (i) An overview of the use of ASRS technology in academic libraries can be found at http://www.slais.ubc.ca/courses/libr500/01-02-wt1/www/J_Loo/index.htm.
- (ii) A video of an ASRS in operation in an academic library can be found at <http://www.ikebarberlearningcentre.ubc.ca/about/building.html>.

4. Environmentally sustainable design with low maintenance costs and durable finishes

Sustainability is considered to be a key aspect of the planning and design, and furniture and equipment selections, of the University's capital projects. As a principle, energy demand is to be minimised through the adoption of passive design solutions as a first priority, ahead of active solutions requiring energy consuming engineering systems. Key sustainability principles to be considered in the concept design:

- Maximise building and siting orientation opportunities
- Appropriate solar access
- Exploit natural ventilation and lighting opportunities
- Design integration of sustainable systems
- Appropriate material selection
- Renewable in lieu of finite resources
- Design to promote reduced power consumption
- Alternative and low impact power sources
- The current library caters to 5,500 visits per day. It is essential that selection of finishes, furniture, fixtures and equipment are sufficiently robust and wherever possible provide for a minimum forty-year life span.